GREENFIRE LAW, PC

Susann M. Bradford
2748 Adeline Street, Suite A
Berkeley, CA 94703
Phone: (510) 900-9502
Email: sbradford@greenfirelaw.com
www.greenfirelaw.com

December 10, 2025

By Electronic Mail

Alameda County Planning Department
West County Board of Zoning Adjustments
224 W. Winton Avenue, Room 111
Hayward, CA 94544
Email: westbzahearing@acgov.org

RE: Public Comment: Agenda Item K.2, PLN2020-00093, CONDITIONAL USE PERMIT, THE MOSAIC PROJECT; The Mosaic Project Final EIR, SCH No. 2021110301.

Dear WBZA Members:

Thank you for the opportunity to comment on the proposed Conditional Use Permit and Final Environmental Impact Report (EIR) for The Mosaic Project (Project). These comments are submitted on behalf of Friends of Castro Valley Canyonlands (FCVC), an association of concerned citizens and Alameda County residents who advocate for the protection and preservation of the agricultural character and unique qualities of the Castro Valley Canyonlands. These comments supplement FCVC's previous comments, attached hereto as **Exhibit A** (Jan. 19, 2024, comment letter and attachments). These prior comments include two Appendices: (A) FVCV's November 21, 2022, comment letter and attached expert comments prepared by hydrogeologist Andrew Zdon of Roux Associates, Inc. (Nov. 17, 2022); and (B) supplemental expert comments prepared by hydrogeologist Andrew Zdon of Roux Associates, Inc. (Jan. 18, 2024).

As explained in FCVC's previous comments on the Draft EIR (DEIR) and the Recirculated Draft EIR (R-DEIR), the proposed Project Site in Cull Canyon is unsuitable for the Project for several reasons, including but not limited to extreme fire risk, absence of secondary evacuation routes, chronic water shortages, susceptibility to flooding and landslides, and inconsistency with the applicable Zoning designations, requirements of Measure D, and the Williamson Act. The additional revisions and responses to comments included in the Final EIR do not provide adequate information to resolve the issues of concern. For these reasons, among others, the Castro Valley Municipal Advisory Council (MAC) wisely rejected the Project by unanimous vote on Augst 25, 2025.

FCVC urges the West County Board of Zoning Adjustments and the County Planning

Department to deny the Conditional Use Permit and Final EIR because the Project is unsuitable for the proposed site. Notwithstanding support for Mosaic Project's educational programs, the proposed Project to build a permanent educational facility housing up to 90 school children per week in a terminal canyon known for extreme fire risk, flooding and landslide risk, limited water supply, and no secondary access routes for evacuation in case of emergency is ill-advised and downplays significant risks and impacts that cannot be mitigated. The Project would also eliminate agriculture land, disrupt wildlife habitat, and impair the rural character of Cull Canyon by nearly doubling its population. As explained below, FVCV urges you to deny this conditional use application and Final EIR for the following reasons: (1) The Final EIR is inadequate as an informational document with respect to Project impacts on hydrology and water quality, fire risk, geology, noise, agriculture, transportation, greenhouse gas emissions, and land uses; (2) the Project Description and Environmental Setting are inadequate; (3) The Project is inconsistent with the applicable general plan land use designations, including Measure D; and (4) the Project fails to comply with the Williamson Act; and (5) the proposed findings are incorrect.

I. The Final EIR is inadequate as an informational document because it fails to provide sufficient analysis and supporting evidence from which to evaluate the project's potential environmental impacts.

The California Environmental Quality Act (CEQA) requires that an EIR must "[i]nform governmental decision makers and the public about the potential, significant environmental effects of proposed activities." (14 Cal. Code Regs, § 15002(a)(1)). This means that an "EIR must include detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project." (*Cleveland Nat. Forest Found. V. San Diego Assn. of Govts.*, 3 Cal. 5th 497, 511 (2017).) The Final EIR falls short of this standard because it fails to provide adequate information in several subchapters of its assessment of potential environmental impacts.

A. The EIR omits key information concerning the proposed site's hydrology and water supply.

Before approving any project, the County must determine that sufficient water is available to support the proposed use and satisfy all public health and safety mandates, including fire flow requirements. (*See* Water Code § 10910; *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal. 4th 412, 433 (2007).) The County also has an affirmative duty to protect the health and safety of existing residents, as well as the public rights to drinking water and the protection of public trust resources. (*See* Water Code § 106.3; *Envtl. Law Found. v. State Water Res. Control Bd.*, 26 Cal. App. 5th 844, 859 (2018).)

Here, the Final EIR fails to support its conclusion that the Project has an adequate water supply. It also fails to provide an accurate estimate of water demand, and fails to show that the proposed water use will have no significant impact on groundwater and neighboring water users.

1. The EIR fails to show that the proposed water source is reliable and will not impact Cull Creek or neighboring water users.

The R-DEIR and Final EIR fail to show that the Project's proposed water supply is adequate to meet its demand, and will have no adverse impact on Cull Canyon Creek or

neighboring water users.

The R-DEIR and Final EIR describe the Project's water supply as consisting of two wells having a combined capacity of 7.7 gallons per minute (gpm). (R-DEIR at 4.14-5.) As noted in previous comments, the R-DEIR failed to disclose a referenced report by Balanced Hydrologics or any detailed analysis or testing data to support this claim. (Exh. A at 2-3.) The Final EIR addresses this issue in *Master Response 5: Hydrology and Utilities* and provides additional information in *Appendix G: Revised Water and Wastewater System Reports.* (Final EIR at 5-12.) However, updated version of Appendix G still fails to support the EIR's conclusions. In fact, the additional documents show that one of the two Projects wells failed the ten-day pumping test and may be connected to the same groundwater source as Cull Canyon Creek. (Appendix G at 107.[1])

Documentation in Appendix G indicates that the Project's reported well capacity ratings are incorrect. Although the R-DEIR states that ten-day pumping tests and source capacity analysis conducted in accordance with California Code of Regulations (CCR) Title 22 identified two wells with a combined rate of 7.7 gpm, the Final EIR admits that one of these two wells "did not fully recover" from the ten-day pump test. (Final EIR at 5-15.) The Final EIR identifies the source of this information as the "Preliminary Technical Report" prepared by SRT Consultant's in 2022 for the Project's proposed drinking water system (Final EIR at 5-12), which is included in Appendix G. (*See* Appendix G, pp. 20-162.) However, the Preliminary Technical Report *incorrectly* summarized the results of the ten-day pumping tests (Appendix G at 32), which are reported in the "Source Capacity Results Technical Memorandum" prepared by Balance Hydrologics, and included Attachment 3 of the Preliminary Technical Report. (*See* Appendix G, pp. 106-36.) While the Preliminary Technical Report asserts that:

> The drawdown in Well 20-1 recovered to 2 feet from the static water level at 9.5 days into the 10-day recovery period, and met the standard. The drawdown in Well 17-1 reached the 95% of total drawdown recovery criteria within 12.66 days, shortly after the 10-day recovery period.

(Appendix G at 32), the Source Capacity Results Technical Memorandum that it referenced actually reported:

> Drawdown in Well 20-1 recovered to 2-ft from static water level at 9.5 days into the recovery, thus satisfying this standard. It also reached 95 percent recovery at 12.66 days after pumping stopped. *The source capacity test at Well 17-1 did not satisfying the recovery standards*.

(Appendix G at 107-08, 112 (emphasis added).) The results of the ten-day pump tests are attached to the Technical Memorandum (*id*., at 117-18, 129-36) which illustrates the results for Well 17-1 in Figure 11. (*Id*. at 132.) The 20-year projection analysis included as Preliminary Technical Report Attachment 4 corroborates these findings and indicates that Well 17-1 still had not recovered from the pump test more than six months later. (Appendix G at 151.)

In addition, the Technical Memorandum cites the following provision of CCR Title 22, indicating that well capacity cannot be determined where, as here, the well does not recover

[1] Due to inconsistent numbering, all citations to Final EIR Appendix G provide the PDF page numbers.

within ten days:

> 22 CCR §64554(g)(2)(C). To complete either the 72-hour or 10-day well capacity test the well shall demonstrate that, within a length of time not exceeding the duration of the pumping time of the well capacity test, the water level has recovered to within two feet of the static water level measured at the beginning of the well capacity test or to a minimum of ninety-five percent of the total drawdown measured during the test, whichever is more stringent. If the well recovery does not meet these criteria, the well capacity cannot be determined pursuant to subsection (g)(2) using the proposed pump rate.

(Appendix G at 112, n. 3.) Thus, the capacity of Well 17-1 cannot be determined, and the Project's only proven water supply is Well 20-1 with capacity of 4.7 gpm.[2]

The record also contains evidence of potential connectivity between the Project's water supply and groundwater feeding Cull Creek, which may be the same groundwater source relied on by other local water users. As noted in previous comments, Well 20-1 is only 100-ft. from Cull Creek in places. (R-DEIR, Fig. 4.8-4.) The Source Capacity Results Technical Memorandum also found that "Well 20-1 was broadly similar to the in ionic composition of baseflow sampled in Cull Creek, suggesting a similar groundwater source." (*Id*. at 108.) Likewise, water samples from Well 20-1 also exhibited a similar chemical profile to baseflow samples from Cull Creek. (*Id*. at 111.) Although the report states that no drawdown was detected during the capacity tests, this suggests potential connectivity between the Project's water supply and the groundwater underlying the Creek.

Importantly, the Project's proposal to rely on well-water as the primary water source for more than a hundred additional people, is a major concern for Cull Canyon residents. Cull canyon has a limited aquifer that is shared and relied on by valley residents as a primary water supply for residential use and livelihood, as most residents are also agricultural water users. Indeed, comments submitted by local residents confirm that well-water is already at risk in this canyon and subject to seasonal variations that can adversely impact agricultural uses.[3] For example, local landowner Rex Warren reported drilling two new wells recently that both came up dry, which forced him to reduce the number of cattle he produces.[4] The amount of water necessary to support the Project may further strain the availability of limited local groundwater and exacerbate these types of problems. The EIR lacks sufficient analysis to support the conclusion that neighboring water users and residential wells will not be affected. In addition, the 20-year projection of water supply availability fails to include any analysis of the long-term effects of climate change. (Appendix G at 139-51.) As noted in our previous comments, current projections indicate that average temperatures and high heat days will continue to increase over the coming decades, which may increase dry spells and fire rsk, placing additional pressures on

---

[2] The Technical Memorandum also notes that the source capacity testing also took place in November rather than during the August – October period designated by statute. (Id. at 108; CCR § 64554.) This was reportedly allowed due to lack of rain, but there was actually nearly an inch of rain (0.9") between September and the tests' completion. (Appendix G at 108.) Whether this rainfall influenced well recovery is unknown.

[3] *See e.g*., Public Comment by Keith Seibert (Jan. 18, 2024), noting frequent groundwater water shortages throughout Cull Canyon.

[4] Rex Warren, Public Comment Re: Notice of Preparation of and Environmental Impact Report (EIR) - PLN2020-00093 (Dec. 19, 2021).

limited water supplies. (Exh. A at 58-68.)

As noted during the Castro Valley MAC hearing, the EIR provides no evidence that any flow tests or stress tests were conducted to ensure that the Project's potential impacts on groundwater and neighboring wells will be less than significant. (CVMAC Land Use Meeting Summary (Aug. 25, 2025) at 6.) There is also no evidence that any groundwater analysis was conducted to examine the sites hydrology and flow patterns, to assess, for example, whether Cull Creek is a gaining stream or losing stream in relation to groundwater. (Exh. A at 54 (hydrogeologist comments).) In sum, the EIR fails to support the finding that water use will have no significant impacts.

Finally, it should be also noted that the first item in Appendix G, which is a letter from the State Water Resources Control Board letter dated December 1, 2022, does not certify that the water supply is adequate for the proposed use, but only that the "application is eligible for a permit application review as an independent public water system." (Appendix G at 4.) As the letter plainly states, "[t]he Division's review and acceptance of this preliminary technical report shall not be deemed approval of project plans or a complete permit application." (*Id*.) Informal emails following up on this letter should also be interpreted in this context. (WCBZA Staff Report (Dec. 10, 2025), Att. A, p.1.)

In sum, the Final EIR fails to support its conclusions concerning the reliability of the Project's proposed water supply or the claim that it will not impact neighboring properties.

2. The EIR fails to provide an accurate estimate of the project's water demand.

The Final EIR and R-DEIR also fail to provide an accurate estimate of the project's expected water demand. The estimates set forth in section 4.14 and Appendix G appears to underestimate the Project's water demand from the camp operations, combined with water purification, agricultural activities, and fire flows. This was also addressed in previous comments, incorporated here by reference. (Exh. A at 4-6.)

Pursuant to California Department of Health regulations, an organized camp is required to provide "[a] dependable supply of potable water adequate to furnish 50 gallons of water per person per day." (17 C.C.R. § 30710.) The Final EIR acknowledges this requirement but contends that this law is outdated and can be disregarded, arguing that the Project's water demand should be based on only 25 gpd per person. (Final EIR at 5-13). NorthStar Consulting also proposes using this lower rate based on a 2002 EPA wastewater treatment manual. (Appendix G at 174-75.) However, these sources does not focus on water demand but examine the capacity required for an onsite waste treatment (septic) system. (*Id.*) Moreover, the cited manual clearly recommends an estimate of 45 gpd per person for a children's camp with central bathroom and showers, which aligns with the proposed Project. (*Id.*; Final EIR at 5-13.) In addition, both the Final EIR and the NorthStar report include an anecdotal description of the average water use based on ten days of meter readings at another unspecified camping facility, no details are provided from which to assess the degree of similarity. (*Id*.) In sum, neither the Final EIR nor the Northstar Report provides a compelling reason to disregard the 50 gpd per person requirement set forth in 17 C.C.R. § 30710.

According to the Final EIR, water use based on 50 gpd per person would equate to a total

demand of 5,700 gpd, which could be met by the supply of a single well rated 4.7 gpm, which would produce 6,768 gpd if run at normal capacity. (Final EIR at 5-13.) However, this demand fails to include the significant amount of water needed to operate the proposed water filtration system. The backwash and brine solution from the reverse osmosis system is projected to total up nearly 20,000 gallons every two weeks, which on the average is over 1400 gpd. Thus, the actual demand appears closer to 7100 gpd, which exceeds what Well 20-1 can handle on a sustainable basis (e.g., 12 hours on, 12 hours off). (Appendix G at 42; Exh. A at 5-6.)

In addition, neither the Final EIR nor Appendix G provides any detailed analysis of water demand necessary to operate livestock and gardening operations. The Final EIR proposes that 1-inch per week of water will be sufficient to maintain the proposed garden throughout the growing season, and will be fully provided for by rainwater. (Final EIR at 5-16.) The EIR also assumes that 5 gallons a day is adequate to support 20 chickens. (*Id*.) Notably, Appendix K, addressing the Project's claimed agricultural uses provides no water budget or operating plan for these activities, and no analysis of whether water will be needed to clean produce and work areas, or manage dust and manure odors, as required by Mitigation Measure AQ-4. (*Id*. at 1-10.) The assumption that no water will be needed beyond rainwater and chicken water lacks analysis. Similarly, the idea these activities would need to rely solely on rainwater or be abandoned seems contradictory to the proponent's assertion that agricultural use is the "primary purpose" of the proposed project. (Appendix K.)

Fire water is also omitted from the overall water-demand calculations. While the EIR provides that approximately 44,000 gallons of water will be stored on site to meet this requirement, there is no water budgeted for filling or refilling this tank periodically, such as after equipment tests or other use. (Appendix G at 163.)

Overall, the Final EIR's numbers appear to be completely unreliable and to egregiously underestimate the average daily demand as well as peak demand, or maximum daily demand, which the R-DEIR inexplicably asserts is just 3975 gpd (R-DEIR at 4.14-7) – rather than the Final EIR's estimate of 6,768 gpd (or 7,100 gpd), not including dust control and agricultural use. (Final EIR at 5-13.) Contrary to the R-DEIR (see 4.8-23, 4.14-7, -10), neither well has sufficient capacity to individually meet the Project's MDD, or peak demand, as required by 22 C.C.R § 64554(c), which states that community water systems "shall be capable of meeting MDD with the highest capacity source offline." The proposed water supply is thus inadequate to meet the Project's demand, even without factoring in water for fire flows, dust control, and agricultural production.

In sum, the Final EIR fails to provide sufficient information from which to determine whether the onsite wells comprise an adequate water supply.

3. The Project's proposed septic system requires additional analysis.

The Project would also install a large onsite wastewater treatment system (OWTS) to treat wastewater from more than 100 people per day within 150 feet of Cull Creek. (Appendix G at 195.) This facility would also be located a short distance upgradient from the Project's proposed water supply. (*Id*.) Although the Final EIR has enlarged this structure to accommodate somewhat higher daily demand estimates (Final EIR at 3-17 to 3-18), its size and location remains problematic. Similarly, the location of experimental gray water system next to the creek

is also problematic.

As noted in previous comments, incorporated here by reference (Exh. A at 6-7), additional analysis is needed to ensure that the wastewater treatment system is adequately sized and positioned to prevent impacts related to overflow and site hydrology. (Exh. A at 55.) Moreover, given that actual waste flows may be significantly greater than projected, the proposed site may not have a feasible location for a septic adequate to meet the needs of the facility. In addition, the Geotechnical Report indicates that the water table is only 30-40 feet below the surface, increasing the risk that contaminated wastewater could impact the shallow aquifer. (Appendix E, p. 13). The proposed septic field is also located upgradient from the Project's wells, raising concern that wastewater will flow in that direction and percolate into the water table feeding the well, thereby contaminating the proposed water supply. (Exh. A at 54.)

Cull Creek is also subject to seasonal flooding, which further increase the risk that flood water could erode the banks and buffer zone between the OWTS and the creek, or inundate the system, causing wastewater to become exposed to surface water or groundwater.[5] (Ex. A at 69-70.) The proponent's analysis of the proposed septic system evaluated soil samples but did not examine localized subsurface flows or hydrogeology. (Appendix E, at 8-9.) Given the proximity of the septic system to the creek, a thorough analysis of the site's hydrogeology is necessary to assess potentially significant impacts of the proposed onsite septic system on groundwater and surface waters. Accordingly, the analyses of standards HYD-1 and UTIL-3 are inadequate and the conclusions are not supported by substantial evidence.

B. The Final EIR fails to provide an adequate analysis of the Project's significant impacts on wildfire risk.

As potential impacts of the Project on wildfire risk are downplayed and not adequately analyzed in the Final EIR or R-DEIR. As noted in previous comments, this includes the increased risk of human-caused wildfires resulting from bringing more people into a High Risk Fire Zone, inadequate evacuation routes and transportation, failure to analyze potential fire dynamics surrounding the site location. (Exh. A at 7-9.) Those previous comments are incorporated here in their entirety.

In sum, the Project relies on a proposed Fire Plan involving fire drills and training to reduce risk, this plan fails to fully examine the substantial increase in fire risk that the project would impose on both on the camp participants and staff and on surrounding residents. (R-DEIR, Appendix F.) The location of the Project site in a high fire risk zone in a terminal box canyon with a single access road (Castro Valley General Plan, Figure 10-1), which currently constitutes the sole evacuation route for approximately 140 residents, cannot be fully mitigated. Bringing another 114 people into this canyon, the majority of whom are children, will substantially increase the risk to the entire community. The proposed evacuation plan is also inadequate to respond to a potential wildfire quickly, requiring large busses to be on call and enter *into* an evacuation zone, creating potential vehicle hazards, at a moment when the flow of traffic will be exiting the canyon. Given the rapidity with which fire can travel through canyons and steep hillsides under dry conditions, this plan is untenable. Like building a children's camp in a flood

[5] EPA, Septic System Impacts on Water Sources, https://www.epa.gov/septic/septic-system-impacts-water-sources (Aug. 23, 2022).

plain, building the Project in hazardous wildfire zone invites the type of risks that are preventable and need to be taken seriously.

The Final EIR also fails to address the limitations of Cull Canyon Road and potential contract limitations restricting school bus drivers from entering hazardous areas. (R-DEIR § 4.15-17.) While the Final EIR acknowledges that Cull Canyon Road is subject to vehicle weight restrictions, prohibiting vehicles over 7-tons, the additional analysis fails to address the public safety hazard related to large vehicles – including school busses – unable to navigate or potentially blocking the sole evacuation route on a narrow road with no turn-outs. (Final EIR at 5-59 to 5-60; Exh. A. at 8, 71.)

Importantly, the issue of wildfire risk affects the health and safety of everyone who lives and works in Cull Canyon. There is only one evacuation route for all of the residents, making fire season an exercise in trust and shared responsibility. It is well-established that wildfire risk increases when more humans are present in the area, as "nearly 85% of wildland fires in the United States are caused by humans."[6] Campers may not fully appreciate the seriousness of this risk to lives and property. A fire at the Mosaic site would be devastating and likely would travel quickly due to steep hillsides and Canyon winds. The Columbia subdivision at the top of the ridge would also be at risk, which has not been evaluated. The risk to the entire community, and the children, demands a thorough analysis and weighs heavily against the wisdom of placing children in a high-risk environment with limited options for evacuation. Recent studies also indicate that indicate climate change is increasing the risk of serious and even fatal fire events within the wildland urban interface. (See Exh. B,[7] at pp. 55-56.)

C. The Final EIR fails to provide an adequate analysis of transportation impacts.

As noted above, the Final EIR fails to address vehicle weight restrictions on Cull Canyon Road. (*Infra*, § I.B.) This issue also underscores the inadequacy of the R-DEIR's transportation analysis. § 4.12. Neither the transportation analysis nor Appendix I: Focused Traffic Study identifies the vehicle weight restrictions or provides any analysis of alternatives to school busses for transporting children to and from the project or for emergency evacuation plans. Accordingly, more analysis is needed to address these issues and examine the potential impacts of alternatives to using standard, full size school buses.

Notably, this issue also affects water trucks. The weight restrictions in the road, greatly limits the option of trucking out wastewater. A gallon of water weighs 8.33 lbs., which means a trick hauling 2000 gallons of water would weigh over 8 tons, exceeding the 7-ton weight restriction on Cull Canyon Road. More analysis is also needed to address wait time and emergency response in the event of a medical emergency. The narrow road could cause delays, which is not evaluated. It's also not clear if potential helicopter landing sites have been identified in the event that a life flight was needed. Improved emergency planning is needed to protect the health and safety of the campers.

---

[6] *See e.g.*, Nat'l Park Service, "Wildfire Causes and Evaluations," https://www.nps.gov/articles/wildfire-causesand-evaluation.htm (citing 2000-2017 data based on Wildland Fire Management Information (WFMI) and U.S. Forest Service Research Data Archive (https://www.fs.usda.gov/rds/archive/catalog/RDS-2013-0009.4).

[7] Cunningham, C.X., J.T. Abatzoglou et al., Climate-linked escalation of societally disastrous wildfires, *Science* (2 Oct. 2025): 53-58.

D. The Final EIR fails to provide an adequate analysis of site geology and soils.

The Final EIR fails to adequately evaluate the risks posed by flooding and landslides in relation to the Project site's steep terrain and stream banks. The construction of the Project will require substantial tree removal and clearings for fire protection which may destabilize steep hillsides that are already prone to slides. The susceptibility of Cull Creek to flooding may also impair Project structures and access roads. Restrictions on fencing within a wildlife corridor may also contribute to increased risk harm to children exploring the camp area near steep streambanks. These issues were raised in previous comments which are incorporated here in their entirety. (Exh. A, at 10-11.)

The Final EIR downplays risks of flooding and landslides, but provides no updated information concerning the condition of the proposed site after the 2023 floods. The stability of the steep hillsides above the proposed residential cabins, as well as proposed construction sites bordering both sides of Cull Creek, requires additional surveys to evaluate potential risks and to assess the adequacy of proposed setbacks and stormwater drainage plans. Evidence of landslides or changes to the creek channel may require substantial modification of the current site plan, squeezed between a steep hillside and a riparian zone.

E. The Final EIR fails to provide an adequate analysis of potential impacts to Biological Resources.

As noted in previous comments, the R-DEIR's analysis of biological impacts is inadequate because it fails to address potentially significant impacts to sensitive and protected species, including Crotch's Bumble Bee and Mountain lions. It also provides no information concerning the methodology used for site surveys to identify sensitive native plants and animals, or the location and distribution of sensitive plant species. The impact analysis also fails to address potential impacts stemming from the operation of the project, impacts of grading and soil replacement, vegetation and tree removal, and additional impacts of clearing 100-foot fire breaks around the new structures. Moreover, the majority of mitigation measures address only construction and fails to analyze impacts during the operation of the Project. The Final EIR also fails to address these issues. Therefore, previous comments on this topic are adopted in their entirety. (Exh. A, 11-14.)

1. The Final EIR fails to examine potential impacts to threatened and endangered species.

a) Crotch's Bumble Bee.

The R-DEIR fails to evaluate Crotch's Bumble Bee, Western bumble bee, and obscure bumble bee for protection under state or federal Endangered Species Acts. (R-DEIR at 4.3-15, -16.) These bumble bee species are currently protected as candidate species under the California Endangered Species Act (CESA), Fish & Game Code §§ 2050 *et seq*., as of September 30, 2022.[8] Under CESA, species classified as a candidate species are afforded the same protection as listed species. (14 C.C.R. § 783.1.)

[8] CDFW, California Natural Diversity Database (CNDDB) (Oct. 2023), p. 5.

While the R-DEIR acknowledges that occurrences of one or more of these endangered Bumble Bees have been reported in the Castro Valley area, it then concludes without supporting evidence that the presence of such bees at the project site is "highly unlikely" due to the absence of grassland or scrub habitat. (R-DEIR at 4.3-16.) However, the R-DEIR elsewhere indicates that some grassland and scrub species are present at the site. (*Id*. at 4.3-7.) In addition, guidance published by the California Department of Fish and Wildlife (CDFW), states that suitable nesting habitat for *bombus* species can include bare ground, abandoned rodent burrows or bird nests, brush piles, rock piles, and fallen logs, as well as manmade structures, and "leaf litter and woody forest edge" provide overwintering habitat.[9] In addition range maps for Crotch's Bumble Bee indicates that it could occur in this area, and that Western Bumble Bee historically occurred in this area.[10] CDFW's Bumble Bee survey guidance also cautions that the "[a]bsence of occurrence records should not be interpreted as absence of the species at or near a given site" and surveys "should be conducted" when there is suitable habitat in the area.[11] Moreover, "[i]t is important to assess habitat both within the proposed project area and in the surrounding landscape . . . [to] help predict whether candidate species could be nesting in adjacent areas and foraging within the project site" or vice versa.[12]

Here, the R-DEIR indicates that no site surveys were conducted to assess the presence of Crotch's Bumble Bee, or any other endangered bumble bee, or to assess the presence of suitable foraging or nesting habitat within the site and surrounding landscape. The R-DEIR should be updated to address this omission by conducting surveys in accordance with CDFW guidelines.

b) Mountain Lion.

The R-DEIR recognizes that Mountain Lions in the project vicinity are a protected species under CESA, and acknowledges that lions may use the project site, but nevertheless fails to examine the Project's potential impacts on Mountain Lions. (R-DEIR § 4.3-15.) Mountain Lion populations in Southern California and the Central Coast region, including the Central Coast Northern (CC-N) population which includes Alameda County, have been recognized as a candidate species under CESA since April 2020.[13] The R-DEIR affirms that Mountain Lions are known to forage in the area and "most likely forages and moves across the project site and surrounding areas," but provides no impact analysis, instead concluding without evidence that the site and surrounding natural areas are unsuitable for denning and not essential habitat. *Id*.

Given that Mountain Lions are likely to use the site and surrounding area, the Project's potentially significant impacts on Mountain Lions should be examined and mitigated. This includes potential impacts related to increased risk of human-lion conflicts, increased noise and human presence, and impacts to wildlife habitat corridors. Notably, the Project's proposed agricultural activities pygmy goats and chickens could attract mountain lions to the area and lead to conflicts or damage that requires nonlethal or lethal removal of such mountain lions. Pygmy

---

[9] CDFW, Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species (June 6, 2023), p. 3, and n.2.
[10] *Id*. at p. 11.
[11] *Id*. at p. 2.
[12] *Id*. at p. 3.
[13] Cal. Fish and Game Comm'n, Notice of Findings: Mountain Lion (Apr. 21, 2020); *see also* Center for Biological Diversity, et al., Mountain Lion Petition (June 25, 2019), https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=171208&inline.

goats released to graze the site, in particular, could be attractive to lions seeking an easy meal. Mature lions, once attracted to the area, could also pose a risk to children and adults; although attacks on humans are rare, they do occur, and generally require the destruction of the animal. These impacts require further analysis to evaluate the risk that lions will be attracted to livestock and develop appropriate mitigation measures. reduce the risk that livestock will attract predators and cause lion conflicts.

In addition, there is also a risk that increased noise and human activity could deter Mountain Lions from using the site as a foraging area or travel corridor. The extent to which Mountain Lions currently use the site is unknown, since no surveys have been conducted. Cull Creek is also "an important corridor for wildlife movement." (R-DEIR § 4.3-17.) More analysis is needed to evaluate whether the noise and impacts from construction, and increased noise and human activity from the operation of the Project, will adversely impact the movement of Mountain Lions through the area. Further, the removal of trees and vegetation for grading, and the construction of fuel breaks around structures will also eliminate the cover available to wildlife, which could also impact wildlife movement through the area. The R-DEIR fails to examine these potentially significant impacts to mountain lions, or to evaluate feasible mitigation measures.

c) American Badger.

The R-DEIR concludes on the basis of undisclosed survey methods that badgers are unlikely to occur in the area, reasoning that "suitable grassland foraging habitat is absent from the proposed development area on the site and no evidence of dens or diggings by this species were observed during the field surveys." (R-DEIR 4.3-15.) However, many surrounding properties do have grasslands and local residents have reported sightings of badgers in the area to CDFW. One canyon resident also found skeletal remains of badger last year. (*See* Exh. A at 72.) Appendix D. Accordingly, additional consideration is needed to evaluate whether badgers may use this area for foraging and to assess the need for appropriate mitigation. In addition, wildlife survey methodology, timing, and data should be fully disclosed.

2. Additional Inadequacies.

The R-DEIR also fails to provide any detailed information concerning the scope and methodology used for habitat assessment and plant surveys. The R-DEIR states that native plants were identified through a field reconnaissance survey conducted in March 2021, with follow-up surveys in April and May 2022, but does not disclose the actual data from these surveys showing the dates, locations, and frequency or distribution of the species that were observed. (R-DEIR § 4.3-12.) There is also no discussion concerning the rationale for the dates selected and whether any of the species screened for would have been difficult to observe at these times. *Id*. Appendix D provides a summation of results consisting of a list of plants that were screened for that indicates whether or not they were observed, but provides no details concerning frequency or distribution. (R-DEIR App. D, pp. *3-6.) As a result, it is impossible to determine which species are likely to be affected by the grading and clearing activities required by the Project. Notably, in addition to the grading required for building and road construction within the proposed building envelope, fire protection requires additional vegetation clearing extending 100 feet from the structures into surrounding habitat. (R-DEIR, § 4.15-20.) The Geotech report also indicates that grading required for construction should extend at least ten feet beyond the actual building areas

to provide for drainage, also increasing the impact area. (R-DEIR, App. E, § 6.1.13.) The extent to these additional clearings will impact sensitive species or extend into riparian areas is also not disclosed or otherwise mitigated.

Similarly, the R-DEIR also provides inadequate information concerning how and when wildlife surveys were conducted. The R-DEIR states only that "[a] habitat assessment was conducted by the EIR biologist as part of the field surveys of the proposed development area." R-DEIR § 4.3-12. However, no documentation is provided concerning the dates, methodology, or data collected. Appendix D provides only a print-out of species information from the CNNDB database. R-DEIR App. D, pp. *7-16. There is no information from which to ascertain the scope of surveys or whether they were conducted at a time or times when species were likely to be present and observable. The CNNDB print-out also indicates that the reported information expired on Dec. 3, 2022, and is thus no longer reliable. *Id*. at *16.

The R-DEIR also fails to evaluate or mitigate the impacts of tree removal and increased noise on wildlife and birds using the area. The R-DEIR states that approximately 44 trees will need to be removed to make way for project construction, 32 of which are native oaks and redwoods. R-DEIR § 4.3-27. There is no analysis of whether this will impact migratory birds, or endangered birds, bats, or raptors using of the area. The R-DEIR also indicates that the project will generate significant noise, both during construction and as a result of the Project's activities bringing groups of 75-95 kids to the site for camping programs. R-DEIR § 4.10.3. However, there is no discussion of the potential impacts of noise on wildlife use of the area. The potential for large groups to further impair biological resources through trampling and incidental damage is not addressed.

In addition, the DEIR fails to evaluate the presence plants and wildlife that may pose a safety hazard to children. This includes wild pigs, which may use the site for foraging or grubbing. Given that pigs can be aggressive, often travel in groups, and forage at night, this could be a safety risk for children attending camp. Certain plant species also pose risks. Poison hemlock, in particular, is common in this area and can be fatal if ingested.[14] The absence of fences along site boundaries and waterways, while beneficial for wildlife, could also pose risks for children who encounter animals like wild pigs or lions when walking alone or in small groups.

F. The EIR provides an inadequate analysis of noise impacts.

The Final EIR fails to support its conclusion that noise generated by the Project and its construction would have a less than significant impact on the environment, utilized an incorrect standard, and omitted key details from the impact analysis. (*see* R-DEIR § 4.10.3) As noted by local residents, the proposed site also sits in a bowl that causes sound to amplify and echo. These deficiencies were addressed in FCVC's previous comments R- DEIR and DEIR., which are here incorporated in their entirety. (Exh. A, at 14, 31-33.)

G. The EIR fails to provide an adequate analysis of agricultural impacts.

The Final EIR fails to address the Project's failure to comply with the Williamson Act,

[14] See "Poison Hemlock," https://www.inaturalist.org/taxa/52998-Conium-maculatum (last visited Jan 18, 2024.)

inconsistency with agricultural zoning and potential impacts on neighboring agricultural land uses. These issues are discussed in FVCV's previous comments, which are incorporated here in their entirety. (Exh. A, at 14-15, 34-35.)

While the Final EIR makes some changes to the Project's proposed agricultural uses, it still fails to show that the Project is agricultural in nature. Notably the Project will remove lands from potential agricultural use by constructing buildings over much of the sites grazing lands and permanently eliminating agricultural uses. Again, it appears that the proposal to sell CSA shares has been tacked on solely as a means to generate agricultural income in the effort to meet the requirements of the Williamson Act.

These deficiencies are further elaborated in section III, below.

H. The EIR fails to provide adequate analysis of the Project's inconsistencies with zoning and land use policies.

As noted in previous comments, the Final EIR fails to address a number of zoning and land use policies, including failure to comply with building requirements of Measure D, failure to comply with residential density restrictions, failure to comply with the riparian buffer zone, and inconsistencies with other general plan policies. These deficiencies were noted in previous FCVC comments and are incorporated here in their entirety. (Exh. A at 15-16).

II. The EIR Fails to Provide an Adequate Description of the Project and the Environmental Setting.

Under CEQA Guidelines section 15125(a), an EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. 14 Cal. Code Regs. § 15125(a). An EIR's description of this environmental setting should be sufficiently comprehensive to allow the project's significant impacts "to be considered in the full environmental context." 14 Cal. Code Regs. § 15125(c). This should also highlight "environmental resources that are rare or unique to that region and would be affected by the project."[15] The environmental setting should also address "any inconsistencies between the proposed project and applicable general plans, specific plans and regional plans." 14 Cal. Code Regs. § 15125(d).

Here, the Final EIR and R-DEIR's description of the environmental setting fails to describe significant features of the regional setting that have a bearing on the project's potentially significant impacts. For this reason, FCVC's previous comments addressing these deficiencies of the DEIR are also applicable to the R-DEIR and are incorporated herein. *See* App. A. § II. This includes the failure to adequately describe the project's physical setting and important limitations of Cull Canyon as well as failure to adequately describe how the project is situated amidst existing land uses.

FCVC's previous comments identified four physical limitations affecting the project

[15] *Id.*

setting that are not clearly addressed in the Final EIR or R-DEIR: (1) Steep terrain and lack of secondary access roads increases fire risk; (2) Limited water sources and a confined aquifer that have already caused water shortages in the area; (3) Cull Creek is subject to flash floods, which may pose safety hazards; and (4) Risk of liquefaction and seismic features throughout the canyon may impair access/evacuation routes independent of risks on the project site. App. A. § II.A. In addition, Cull Canyon Road is narrow, lacks shoulders or turnouts, and is prone to flooding and landslides, which affects ingress and egress for the canyon's entire population. App. C. These limitations affect the lands surrounding the project site, as well as the project site, and are not adequately addressed in the EIR.

The previous comments also address the R-DEIR's, failure to adequately describe the rural and the agricultural character of the environmental setting, including legal protections enacted to preserve this character, including: (1) Alameda County's agricultural zoning designation; and (2) Measure D. App. A. § II.B. These zoning and land use restrictions are inconsistent with a high density residential camp involving more than 100 people. Notably, the existing caretaker residence had to be approved under a variance because even a single residential home violates the applicable zoning requirements, which only allows residential use on parcels of 100 acres. The proposed Project would add another larger residence as well as facilities to house and feed 108 campers. While the proponents seek to pass this off as a "recreational use" allowed under the Agricultural zoning designation, this ignores the distinction between low-intensity and high-intensity recreation. For example, playing ball in a field is distinguishable from building an indoor stadium. Similarly, building hiking trails and tent campsites would retain the natural character of the land, while in contrast, building a large, 8-bedroom home, with twelve permanent cabins, and a large multi-purpose building would not preserve the land.

Thus, much like the earlier R-DEIR, the final DEIR fails to provide a full and informative description of the environmental setting that recognizes and addresses these important limitations.

Furthermore, the Final EIR also fails to provide an adequate description of the Project. Whether the Project is a camp or a school should not be ambiguous. There is no question that the Mosaic Project's primary activity is educational. Representing this a a recreational camp is ingenuous. As other comments have noted, there is clear evidence of educational mission on the Project's website, and the Project site has few areas that can be used for outdoor recreation due to steep hillsides and proposed buildings. The Project description fails to identify the nature of the project and therefore also violates CEQA.

III. The Project Fails to Comply with the Williamson Act.

As noted above with respect to Agricultural impacts, the Project fails to comply with the Williamson Act.

The Project's primary purpose is not commercial agriculture.

Pursuant to Uniform Rule 1 of Alameda County's Eligibility Requirements for Agricultural Preserves and Williamson Act Contracts for Agriculture, "the contracted land must be devoted to commercial agriculture as the primary use of the land." Uniform Rule 1, § I.C. In

addition, for parcels under 40 acres, "if compatible use is proposed, at least 50% of the parcel must be used for commercial agriculture to ensure that any development is incidental to the agricultural use." *Id.* § I.C.3.(b)(3).

Here, although R-DEIR Appendix K purports to establish otherwise, the Project's primary purpose is not commercial agriculture. Notably, the Mosaic Project's mission has nothing to do with agriculture. The Mosaic Project website describes their actual mission, which is focused on developing skills of community building, empowerment, and peacemaking.[16] The Outdoor Project is described as "immersive, experiential education program" with an "evidence-based, social-emotional learning curriculum is designed to address issues of difference, build self-esteem, and inspire inclusion."[17] There is no mention of agriculture. While the DEIR and R-DEIR include an agricultural element, there is no serious question that the primary purpose of the project is educational, and the overriding goal of the Proposed Project is to establish a permanent site for the Outdoor Project, by building an Outdoor Project Camp. The Project's founder has also stated publicly that the Outdoor Camp is a school and not a summer camp.[18]

Notably, the R-DEIR provides no analysis of how agricultural products will be processed and prepared for distribution, and no discussion of a sanitary facility for preparing goats' milk and cheese for CSA boxes and consumption by children attending camp.[19] There is also no analysis of the water supply required for the Project's agricultural component. In fact, the R-DEIIR's impact analysis states that the Project proposes to rely entirely on gray water and rainwater for irrigation and agricultural activities, but provides no analysis of rainwater catchment or quantity needed to accomplish these objectives. Moreover, there appears to be no contingency plan for drought years where sufficient water may not be available, suggesting that the agricultural purpose would need to be abandoned if not adequately supported by rainwater. These omissions would appear to be highly unusual if the primary purpose of the project was in fact agricultural production, and not an educational children's camp in keeping with the applicant's mission.

Further, the decision to use at least 50% of the land for grazing goats is also accompanied by no rationale or analysis of potential impacts to native plants or wildlife habitat. Appendix K simply states that 25 acres of the 37-acre site will be used for CSA boxes, but provides no analysis to support this arbitrary figure. Again, this appears to be devised solely for the purpose of tacking on an agricultural component in the effort to shoehorn an educational project into the constraints of the Williamson Act.

A. The Project does not meet the Williamson Act's building restrictions.

Compatible uses under the Williamson Act must also meet the requirements of Uniform Rule 2, which requires buildings to comply with maximum building intensity and 2-acre building envelope requirements, consistent with Measure D and the A-Designation. Uniform Rule 2, § I.B. That is, all residential and residential accessory buildings "shall have a maximum floor space of 12,000 square feet" and all buildings "shall be located on a contiguous rectangular

[16] Mosaic Project, "Mission," https://mosaicproject.org/about/mission/ (last visited Jan 14, 2024).
[17] Mosaic Project, "Outdoor Project," https://mosaicproject.org/outdoor-project/ (last visited Jan 14, 2024).
[18] *See e.g.*, Public Comment by Cull Canyon Resident Teddy Seibert (Jan. 18, 2024),
[19] *Id.,* noting the R-DEIR's failure to include a serious analysis of the facilities, equipment, and procedures needed to conduct the proposed commercial agricultural activities.

building envelope not to exceed 2 acres." *Id*. Residential units on contract lands are also restricted to habitation by owners, immediate family members, agricultural employees, seasonal laborers, or caretakers. *Id*. § II.A.1. In addition, passive recreational use "is limited to land in its agricultural or natural state." *Id*. § II.C.2.a.

Here, the Project's proposed buildings are not fully contained within a contiguous *rectangular* 2-acre proposed buildings requirements. As shown in Figure 3-4 of the R-DEIR, the purported building envelope is shaped more like a guitar than a rectangle. While the main cluster of buildings on the west side of the creek appears to be laid out in a more or less rectangular pattern, the "envelope" boundary then traces the road across Cull Creek and widens again to encompass the mobile home site and parking areas on the east side of the creek. This requirement therefore is not met.

In addition, if the cafeteria/mess hall building should be recognized as a residential accessory building, as the sole kitchen and dining hall for guests residing in the cabins, then the total residential floor area therefore exceeds the allowable floor space of 12,000 sq. ft.

It also appears highly unlikely that the Project can comply with the further requirement that all residential buildings be occupied by the property owner, an immediate family members, or agricultural caretakers, or agricultural workers or laborers. Neither the R-DEIR nor Appendix K addresses this issue. While the caretaker residence may meet this requirement, the Project description indicates that the staff residence will be occupied by Mosaic Project staff, at least some of whom are more likely to be educators or Outdoor Project staff rather than agricultural workers. In addition, the cabins provide temporary housing for students and educational support staff or volunteers that are not agricultural workers. Therefore, the Project fails to comply with the Williamson Act.

IV. The Proposed Project is Inconsistent with Applicable Zoning Requirements and Land Use Plans.

As noted in FCVC's comments on the DEIR, the proposed Project fails to comply with important zoning code provisions and applicable land use plan policies. This includes the building intensity restrictions imposed by the A District zoning designation and Measure D. Additional inconsistencies identified in the DEIR also apply to the R-DEIR and are incorporated here by reference. (Exh. A, at 38-41.)

Pursuant to Government Code section 65860, zoning and land use approvals must be consistent with the policies and requirements of the applicable general plan. Land use approvals must also comply with the applicable zoning ordinances.

As noted previously, the Castro Valley General plan designates Cull Canyon as an area where special planning efforts are needed to address unique features, including biological resources and steep terrain. The plan states that "development in this area should be limited to protect these sensitive areas." Castro Valley General Plan at 3-12 (March 2012).

Notably, the proposed Project is still inconsistent with Alameda County General Plan ("ACGP") policies concerning fire safety. In particular, Countywide Safety Element, Policy 8, provides that "[t]he County shall limit residential development to very low densities in high fire

hazard zones identified in Figure 5.," which clearly includes Cull Creek Canyon and the proposed site. Countywide Safety Element, pp. 25, 30. The East County Area Plan ("ECAP") states similarly that '[t]he County shall limit residential development to very low densities in high fire hazard zones as identified by the Fire Hazard Severity Scale." ECAP, p. 76. Because the prosed project is not low-density it conflicts with these general plan policies.

In addition to those points incorporated by reference, the proposed Project also appears to violate the County's Watercourse Ordinance, by including road construction within the riparian setback, or buffer zone. Alameda Cty. Code § 13.12.310-320. This is evident in R-DEIR Figure 3-4, where the road appears to cross more than 15 feet into the setback area. Notably, this fails to address additional impacts from grading to prepare the roadbed and stabilize the shoulders of the proposed road. The proposed parking area on the east side of the creek near the bridge also appears to touch or cross the setback boundary, indicating that construction activities may cross into this area. These violations increase risk of soil erosion and sediment pollution, which is also contrary to Castro Valley General Plan Policy 7.1-5 Riparian Habitat: "New development shall not disturb any riparian habitat." Castro Valley General Plan, at 7-11.

Thus, the updated Project remains inconsistent with multiple zoning ordinances and general plan policies.

V. The R-DEIR Fails To Consider an Adequate Range of Alternatives.

The R-DEIR fails to consider an adequate range of alternatives to the proposed project. It not only fails to consider any alternative locations, but also fails to support its conclusion as to the Environmentally Superior Alternative.

Pursuant to CEQA Guidelines, the "key question and first step in analysis is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR." 14 Cal. Code Regs. § 15126.6(f)(2)(A). If the lead agency concludes that no feasible alternative locations exist, "it must disclose the reasons for this conclusion, and should include the reasons in the EIR." 14 Cal. Code Regs. § 15126.6(f)(2)(B).

Notably, "[t]he process of selecting the alternatives to be included in the EIR begins with the establishment of project objectives by the lead agency. A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings." *In re Bay-Delta*, 43 Cal.4th 1143, 1163 (2008) (internal citations omitted). Project objectives may not be so narrowly defined that no other alternatives can be considered. *We Advocate Thorough Envtl. Review v. Cty. of Siskiyou*, 78 Cal. App. 5th 683, 692-93 (2022). Rather, the failure to consider any other site is prejudicial because "it dismissively rejected anything other than the proposed project . . . [thereby] prejudicially prevent[ing] informed decision-making and public participation." *Id*. at 693.

Here, although the EIR considers additional alternatives for the same site, it still fails to evaluate any alternative location for the project. R-DEIR, 5-3. As with the DEIR, the only rationale offered for rejecting an alternative location states: "An alternative location for the proposed project was considered infeasible due to availability of sites that would support the

project's objectives." *Id*. Again, there is no indication of any effort to identify alternative locations or identification of sites that were considered but found infeasible. Instead, the possibility of an alternative location is dismissed without evidence of due consideration.

In sum, none of the alternatives considered address the larger issues of housing the camp in a box canyon with high fire risk, no secondary evacuation routes, and a limited water supply. Nor does the analysis of alternatives explain why no alternative sites were considered. As a result, the analysis of alternatives is inadequate and prejudicial.

VI. CONCLUSION

For the foregoing reasons, the Final EIR is inadequate. It fails to disclose critical information or to provide supporting evidence for its conclusions, and fails to provide an adequate evaluation of potentially significant environmental impacts, as well as hazardous conditions that could affect the health and safety of Project participants and area residents. The Mosaic Project's educational programs merit a better location with adequate access routes, adequate water supply, fewer safety hazards, and fewer environmental impacts.

Sincerely,

Susann M. Bradford

Greenfire Law, PC

Exhibit A

GREENFIRE LAW, PC

Susann M. Bradford
2748 Adeline Street, Suite A
Berkeley, CA 94703
Phone: (510) 900-9502
Email: sbradford@greenfirelaw.com
www.greenfirelaw.com

January 19, 2024

By Electronic Mail

Albert Lopez, Planning Director
ATTN: The Mosaic Project Recirculated Draft EIR (PLN2020-00093)
Alameda County Community Development Agency
224 W. Winton Avenue, Suite 111
Hayward, CA 94544
Email: albert.lopez@acgov.org

RE: Public Comment on The Mosaic Project Recirculated Draft EIR [PLN2020-00093].

Dear Director Lopez, et al:

Thank you for the opportunity to comment on The Mosaic Project Recirculated Draft Environmental Impact Report (R-DEIR). The following comments are submitted on behalf of Friends of Castro Valley Canyonlands (FCVC). FCVC is an association of concerned citizens and Alameda County residents who advocate for the protection and preservation of the agricultural character and unique qualities of the Castro Valley Canyonlands.

FCVC is extremely concerned that Cull Canyon is an unsuitable location for the Mosaic Project's proposed Outdoor Project Camp ("the Project") due to risks and constraints of the geographical setting. The Project is likely to have significant impacts on the environment, expose children and residents to significant health and safety risks, and is also inconsistent with planning and zoning restrictions and other legal requirements. Moreover, none of these issues are adequately evaluated in the R-DEIR and the majority of impacts cannot be adequately mitigated due to constraints of the physical setting. Proceeding with this location in spite of its serious limitations threatens to cause significant damage to natural resources, harm existing residents and businesses, and jeopardize the health and safety of children and other Project participants.

This comment letter supplements previous comments submitted by FCVC concerning deficiencies of the October 2022 Draft Environmental Impact Report (DEIR).[1] Because many of the issues identified in the previous comments have not been addressed and also apply to the R-DEIR, that letter is appended and incorporated herein as **Appendix A.** This comment also

[1] See Greenfire Law, PC (Nov. 21, 2022), Public Comment; The Mosaic Project Draft EIR (October 2022), SCH No. 2021110301.

identifies additional deficiencies of the R-DEIR, including new inaccuracies stemming from outdated information and issues overlooked in our previous comments.

The R-DEIR, like the preceding DEIR, fails to provide an analysis sufficient to inform decision-makers and the public of the potentially significant environmental impacts of the proposed Outdoor Project Camp ("the Project"). The R-DEIR also fails to consider important site restrictions, omits supporting evidence for several conclusions, downplays or misrepresents inconsistencies with applicable land use plans, ordinances and other legal restrictions, fails to evaluate safety risks related to the proposed site, and fails to provide a meaningful analysis of alternatives.

I. The R-DEIR Fails To Provide an Adequate Analysis of the Proposed Project's Potential Environmental Impacts.

Pursuant to the California Environmental Quality Act (CEQA), the purpose of preparing an Environmental Impact Report (EIR) is to "[i]nform governmental decision makers and the public about the potential, significant environmental effects of proposed activities." CEQA Guidelines § 15002(a)(1).[2] In order to achieve this, an "EIR must include detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project."[3] *Cleveland Natl. Forest Found. v. San Diego Ass'n of Gov'ts*, 3 Cal. 5th 497, 511 (2017). As explained below, the R-DEIR fails to provide adequate information in several subchapters of its assessment of potential environmental impacts.

A. The analysis of the Project's potential impacts to water resources is inadequate.

The R-DEIR fails to support its conclusion that the project's proposed water use will have no significant impact on area groundwater and surface water, fails to provide an accurate estimate of water demand, and fails to analyze the adequacy of proposed fire flows.

1. The R-DEIR fails to show that the proposed water source is reliable and will not impact Cull Creek or neighboring water users.

The R-DEIR fails to provide evidence that the Project has an adequate and reliable water supply. *See* **Appendix B,** Water Supply Comments by Roux Associates. Like the previous draft, the R-DEIR asserts that the project has an ample water source consisting of two on-site wells, but provides no data or analysis to support the conclusion that heavy use of these wells will not adversely impact flow levels in Cull Creek or impair groundwater levels affecting other wells in Cull Canyon. R-DEIR, § 4.14.1.2. This issue was also raised in previous comments addressing the DEIR, which included comments by a certified hydrogeologist who examined the record and found no evidence that potential groundwater impacts and groundwater-surface water interconnection had been adequately evaluated. *See* App. A, Attachment (Roux Associates, Inc. (Nov. 17, 2022)). Despite FCVC's repeated requests that this information be released, the R-DEIR makes the same exact claims, and again provides no supporting data or analysis. App. A, at pp. 1-2; R-DEIR, § 4.14, pp 5-6. The R-DEIR does not acknowledge these prior requests, and

[2] 14 Cal. Code Regs., §15000-15387 are herein referred to as the "CEQA Guidelines."
[3] Cleveland Nat. Forest Foundation, 3 Cal. 5th 497, 511 (2017).

does not explain why this information continues to be withheld from public review.

Like the previous draft, the R-DEIR states only that Balance Hydrologics conducted groundwater exploration and well testing for the Project and asserts on this basis the water supply is adequate. R-DEIR, § 4.14.1.2. But as explained in Appendix B, this is not adequate because neither the R-DEIR nor any of its Appendices provides sufficient information to support its conclusions. App. B at p. 1, 4. For example, there is no indication as to when the wells were tested, how seasonal variations were assessed, or whether the existing draw on the aquifer was evaluated. *Id*. at pp. 2-3. There is also no indication that potential contamination from the nearby septic system and proposed grey water irrigation system, both upstream from the source wells, was at all evaluated. *Id*. Without more detail, there is no way to assess whether the proposed water supply will be reliable. *Id*.

Notably, while the R-DEIR adds more pages to Appendix G: Hydrology Reports (formerly titled *Wastewater Basis of Design*), these additions do not provide additional substantive information to remedy the lack of substantial evidence concerning when and how the hydrologic analysis was conducted. The added pages include a cover letter from Balance Hydrologics, which merely asserts that the work was completed in compliance with 22 C.C.R. § 64554, and states that the results were accurately reported. R-DEIR App. G, *1.[4] No further details regarding the actual data, well reports, or test results are provided. There is also no indication that seasonal variations in the water supply were at all examined. Nor does the R-DEIR provide any information concerning the rationale for the well-test used, historical use of the aquifer, or data from monitoring of other local wells -- all of which are required by § 64554. Notably, such documentation should be available, since it is supposed to be reported to the State Water Board pursuant to § 64554 (e) and (g).

R-DEIR Appendix G also adds a 13-page excerpt of a March 2022 report by SRT Consultants ("SRT Report"), which appears to be the source of information contained in DEIR and R-DEIR sections 4.14.1.2 through 4.14.1.4. This report again references work conducted by Balance Hydrologics but provides no additional data or information about the testing and results than what was already stated in the DEIR and repeated in the R-DEIR. *See* R-DEIR App. G, *2-14. Thus, the additions to Appendix G provide no transparency as to the test results and hydrological information that informed the R-DEIR's conclusion that the proposed use will have no impact on adjacent creek flows or other nearby water users.

Further, as explained in FCVC's previous comments, incorporated herein, one of the project's proposed water sources, well 20-1, is only 100-feet from Cull Creek at places, which may allow well draw-down to impact creek flows. See R-DEIR, Fig. 4.8-4; App. A, § I.A.2. There is no evidence in the R-DEIR that this was adequately examined. In addition, Cull Canyon is a terminal canyon with many water users already relying on a limited aquifer for well water for residential use, agricultural use, and some commercial uses. *Id.* In fact, comments submitted by local residents indicate that well-water is already at risk in the canyon and subject to seasonal variations that can adversely impact agricultural uses.[5] For example, local landowner Rex

[4] An asterix identifies PDF page numbers for documents without citations to pages of documents that do not have page numbers.

[5] See e.g., Public Comment by Keith Seibert (Jan. 18, 2024), noting frequent groundwater water shortages throughout Cull Canyon.

Warren reported drilling two new wells recently that both came up dry, which forced him to reduce the number of cattle he produces.[6] *Id*. There is no evidence in the R-DEIR that impacts on neighboring wells was adequately examined. Accordingly, the R-DEIR is inadequate to support the conclusion that the project's proposed water use is sufficient to meet the needs of the project.

Failure to disclose the basis for the R-DEIR's conclusion that the proposed project – a residential camp serving 108 people in addition to caretakers and residents, plus new agricultural uses – would have no impact on other water users and creek flows is inconsistent with the purposes of CEQA.

2. The R-DEIR fails to provide an accurate estimate of the project's water demand.

The R-DEIR also fails to provide an accurate estimate of the project's expected water demand. The estimate set forth in section 4.14 and Appendix G appears to underestimate the water demand from the camp operations, and completely omits any water use estimate for the proposed agricultural activities, which includes livestock, chickens, and a production garden sufficient to supply a Community Supported Agriculture (CSA) program and provide the camp program with eggs and seasonal produce. R-DEIR App. K. There is also no analysis of how much water is necessary to maintain adequate fire flows for the facility.

Pursuant to California Department of Health regulations, an organized camp is required to provide "[a] dependable supply of potable water adequate to furnish 50 gallons of water per person per day." 17 C.C.R. § 30710. The R-DEIR acknowledges this but nevertheless calculates the project's water demand based on only 25 gpd per person. R-DEIR § 4.14-6; App. G (SRT Report, p. 2). This much lower demand rate is based on a report by NorthStar consulting and an EPA wastewater treatment manual. *Id.* These sources do not focus on water demand but examine the capacity required for an onsite waste treatment (septic) system. App. G at *18-19 (NorthStar Report pp. 2-3). While the NorthStar report includes an anecdotal description of the average water use based on ten days of meter readings at another unspecified camping facility, no details are provided from which to assess the degree of similarity. *Id.* However, even if the facilities are similar, this estimate is wholly inadequate: the adequacy of the water supply is not based on average flows but requires sufficient reliable source capacity to meet the Maximum Daily Demand (MDD). 22 C.F.R. § 64554. The regulation requires MDD estimates based on averages from a similar facility to calculate average daily usage based on the most recent ten *years* of data from that source – not ten days – and then to "multiply [that average] by a peaking factor of 2.25." *Id*., subd. (b)(3) and (4). NorthStar gave a rough estimate based on ten days that does not account for seasonal and annual variations, and clearly does not comply with the water supply regulation.[7] Neither the R-DEIR nor the SRT Report explains this discrepancy – or the decision to disregard the 50 gpd per person requirement set forth in 17 C.C.R. § 30710.

The NorthStar report also cites tables from an EPA OWTS manual, which states that the typical wastewater flow for children's camps with central toilet/bath facilities, like the proposed project, is 45 gpd per person. App G. at *73. However, instead of adopting this figure, NorthStar

[6] Rex Warren, Public Comment Re: Notice of Preparation of and Environmental Impact Report (EIR) - PLN2020-00093 (Dec. 19, 2021).

[7] Notably, even if 19 gpd per person was an accurate estimate of average daily usage, the peaking factor would result in an MDD of 42.75 gpd per person.

averages this rate with a lower rate (25 gpd) listed for "pioneer type" camps, and then reduces this average further, assertedly to adjust for water-saving fixtures. App. G at *18-19, 73. NorthStar provides no explanation for its assumption that the Mosaic Project is operated like a pioneer type camp, which is undefined but commonly refers to primitive camping.[8] And again, there is no calculation of MDD or consideration of peaking factors.

In addition, neither the R-DEIR nor Appendix G provides any estimate of water demand necessary to operate livestock and gardening operations. The DEIR assumes without analysis that collected rainwater and greywater will be adequate to support the proposed agricultural uses throughout the growing season. R-DEIR at 4.14-10. There is no estimate of how much water is necessary to raise goats and chickens, and operate a production garden sufficient to fill CSA boxes, bottle fresh goats' milk, and also provide the camping program with vegetables. *See* R-DEIR App. K. Moreover, since greywater is unsuitable for vegetables and livestock watering, these activities would need to rely solely on rainwater or be abandoned, which seems contradictory to the proponent's assertion that agricultural use is the "primary purpose" of the proposed project. R-DEIR App. K. There is also no analysis of how goats' milk will be handled and provided to customers, and whether health standards require the animals to be cleaned regularly, and bottles to be sanitized. Nor is there any analysis of how much rainwater can be reasonably anticipated based on average local rainfall, and whether this will even fill the proposed irrigation tanks.

The R-DEIR also provides no analysis of water demand necessary to maintain adequate fire flows. For example, the 2016 California Fire Code recommends fire flow capacity of 1,500 gpm (gallon per minute) for a duration of two hours for buildings with (multi-level) floor area between 3600 sq. ft. and 22,700 sq. ft. *See* Cal. Fire Code (2016), App. B, § B105. The R-DEIR indicates only that "[o]ne 38,000-gallon tank would be provided for fire protection," and that this "has been sized to support a fire flow demand of 1,000 gpm." R-DEIR, 4.14-10. The R-DEIR conjectures that this tank would be filled between camping programs and then generate little demand. However, it provides no analysis to establish the adequacy of this quantity of water to provide for the project's 14 residential buildings and 8500 sq. ft. multi-purpose building. There is no description of how the proposed 1,000 gpm flow rate will be achieved – and no consideration of what happens after this tank empties in 38 minutes. *Id*. At minimum, some analysis is needed to assess the adequacy of the proposed water supply to provide for fire flows, but this is lacking.

The R-DEIR's water supply calculations also fail to factor in the high volume of wastewater generated by the onsite water treatment system. The report estimates that backwash and brine from the reverse osmosis (RO) system will total nearly 20,000 gallons of water every two weeks. R-DEIR at 4.14-9. Assuming the estimates are correct, this comes out to an average of 1,415 gallons per day, or nearly a gallon per minute, that will be unusable. Thus, even supposing optimistically that the two wells do reliably produce 7.7 gpm, an estimated 13% of this water will not be available to meet the Project's demand.[9] This water is completely omitted from the R-DEIR's estimate of peak water demand. *Id*., at 4.14-7, Table 4.14-3. The plan to haul

[8] *See e.g*., "What is Pioneer Camping? (The answer and Supply and Setup Tips)," https://glampingorcamping.com/home/what-is-pioneer-camping/.

[9] This estimate may also be low, as many RO systems average 15-30% brine water, and efficiency may vary with temperature and pressure. See EPA, "Overview of Drinking Water Treatment Technologies" (last updated April 13, 2023), https://www.epa.gov/sdwa/overview-drinking-water-treatment-technologies.

wastewater away from the site is also problematic due to weight restrictions on Cull Canyon Road. Even a small tanker truck is likely to exceed the road's 7-ton weight limit, since 2000 gallons of water weighs more than 8-tons, not including the vehicle weight. *See supra* § I.C.

As a result of these errors, the R-DEIR's conclusion that the two on site wells have sufficient capacity to meet the project's water demand is also incorrect. The R-DEIR proposes that the Project's MDD is only 3,975 gpd, but this is simply the sum of the average residential use (1,275 gpd) and the estimated campground use (2700 gpd), when based on average daily usage of only 25 gpd per person. R-DEIR, at 4.14-6. If the projected campground usage is increased to 50 gpd, as required by 17 C.C.R. § 30710, the MDD estimate increases to 6,675 gpd, or 4.64 gpm. Thus, even without factoring in water for agricultural use and fire flows, or applying a peaking factor, the *average* water demand exceeds the capacity of well 17-1 (3.0 gpm), and nearly equals that of well 20-1 (4.7 gpm).[10] And, if we also factor in the average daily volume of treatment system waste flows, this comes up to 8090 gpd, or 5.6 gpm, which exceeds the capacity of either well individually. Thus, contrary to the R-DEIR (*see* 4.8-23, 4.14-7, -10), neither well has sufficient capacity to *individually* meet the Project's MDD, or peak demand, as required by 22 C.C.R § 64554(c), which states that community water systems "shall be capable of meeting MDD *with the highest capacity source offline*." The proposed water supply is thus inadequate to meet the Project's demand, even without factoring in water for fire flows and agricultural production.

There is also no analysis of cumulative impacts to the area water supply to evaluate how the proposed level of groundwater pumping will augment the total burden on the aquifer from existing groundwater pumping for agricultural, residential, and commercial uses that draw on the same aquifer. The R-DEIR concludes that there will be no cumulative impacts but provides no supporting evidence concerning the locations of neighboring wells or the existing water budget of the Cull Creek Canyon aquifer. But without a detailed water balance, there is no support for this conclusion. *See* App. B, at p.3.

In sum, the R-DEIR's analysis of the project's potential impacts on water resources is inadequate because the estimated water demand is inaccurate, violates 17 C.C.R. § 30710, and omits agricultural activities and fire flows, and because the MDD is not calculated correctly, and the source wells are inadequate to meet MDD with the highest-capacity source offline, per 22 CCR § 64554. As a result, the analyses of standards HYD-2, UTIL-1, UTIL-2 and UTIL-7 are inadequate and the conclusions are not supported by substantial evidence.

3. The analysis of the proposed onsite wastewater treatment system (OWTS) is inadequate.

As with the DEIR, the R-DEIR's analysis of potential impacts related to the project's proposed septic system, or OWTS, is also inadequate. *See* Previous comments, App. A, §§ I.A.3 and I.C. In addition to issues raised in previous comments, the OWTS analysis also relies on incorrect water demand estimates, as discussed above. That is, the proposed OWTS was designed to meet system capacity based on average daily water usage of 25 gpd instead of 45 gpd, as indicated for children's camps with central facilities. R-DEIR, App. G at *73 (EPA manual). As a result, the current design has insufficient capacity to meet the actual flows from

[10] These estimates may not be reliable since neither well appears to have been examined for seasonal variations.

the project. In addition, the R-DEIR does not examine potential environmental impacts due to system overflow, such as inadequate filtration or impairment to water quality.

Moreover, the proposed location for the septic system is less than 150 feet from Cull Creek and the two drinking water wells. R-DEIR App. G, p. *35. The appended Geotech Report, also indicates that the water table is only 30-40 feet below the surface, increasing the risk that contaminated wastewater could impact the shallow aquifer. R-DEIR Appendix E, p.13. The proposed septic field is also located up-stream from the wells, especially well 20-1, which raises additional concern that wastewater will flow in that direction and percolate into the water table feeding the well, thereby contaminating the proposed water supply. App. B, p.2. Additional analysis is needed to ensure that the wastewater treatment system is adequately sized and to identify potential impacts related to overflow and site hydrology. *Id*. However, because the actual waste flows may be significantly greater than projected, the proposed site may not have a feasible location for a septic adequate to meet the needs of the facility.

In addition, new information included in Appendix J of the R-DEIR reports that excavations conducted in the area of the proposed staff residence for archaeological surveys identified "the presence of hydric soils indicat[ing] that the area is regularly saturated by water." R-DEIR App. J, pp. 5-6. This area is adjacent to the proposed septic site, raising additional concerns that the proposed location for the OWTS may impair or be affected by perennial water features. This also appears to conflict with the soil analysis prepared for the OWTS, reported in Appendix G, which does not mention hydric soils. R-DEIR App. G., *36-38. The Geotech analysis also examined two soil trenches in this area and noted high moisture content in some samples. App. E, pp. 5, 10-11, 15, and App. C (*76-77), Exploratory Trench Log T19-3, T19-4. More information is needed to reconcile these several soil analyses and to verify whether hydric soils are present and, if so, to examine the risk that this could cause the proposed OWTS to impair water resources.

The R-DEIR also no provides no analysis addressing whether plans to extend the project's driveway/access road over the top of the existing septic field for the caretaker residence could impact the functioning of that system. Moving the road to avoid this issue is also problematic due to the adjacent riparian area and proximity of Cull Canyon Road. This too requires further analysis. Likewise, there is no analysis of the risk of building over the existing culvert, or potential impacts of moving it.

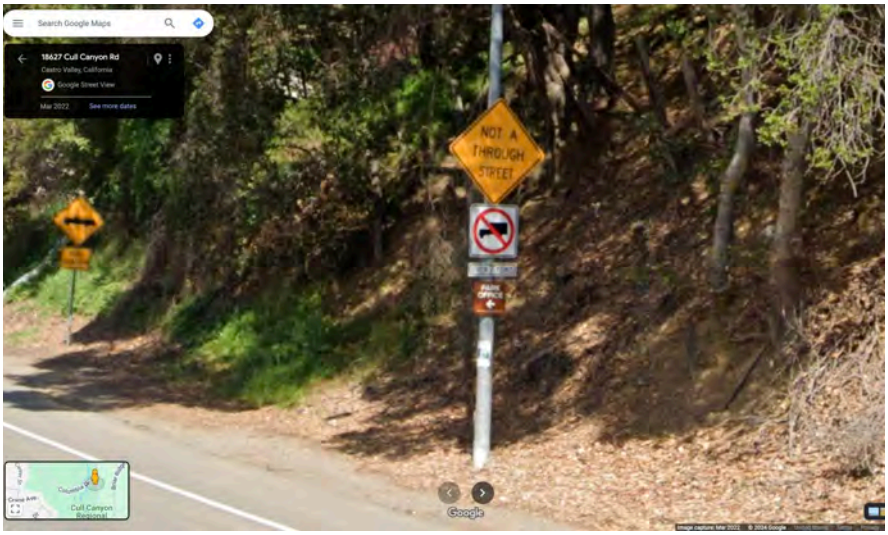
Accordingly, the analyses of standards HYD-1 and UTIL-3 are inadequate and the conclusions are not supported by substantial evidence.

B. The R-DEIR provides an inadequate analysis of potential impacts on wildfire risk.

The Project's potential impacts on wildfire risk were previously addressed in the previous FCVC comments on the DEIR, which are incorporated herein. See App. A § I.B. The R-DEIR makes no substantive changes in response to those comments and continues to ignore the increased risk of human caused wildfires associated with bringing a large number of additional people into a High Risk Fire Zone.

In addition, the proposed evacuation plan, which relies on offsite buses to be called to pick-up children in event of emergency, fails to address vehicle weight restrictions on Cull

Canyon Road and potential contract limitations restricting school bus drivers from entering hazardous areas. R-DEIR § 4.15-17. Notably, Cull Canyon Road is not suitable for school bus travel due to vehicle weight restrictions prohibiting vehicles over 7 tons. *See* **Appendix C**, Flooding ad Road Hazards, p. 3. Most standard (Type C) school buses exceed this limit, particularly when loaded with passengers.[11]



Weight limit sign at intersection of Cull Canyon Road and Columbia Drive.

The use of overweight buses may pose additional hazards for fire fighters and other residents relying on Cull Canyon Road as the sole evacuation route for the entire canyon. Further, because the road is narrow and lacks shoulders and turnouts, it is easily blocked by other large vehicles as well, increasing the risk that evacuation could be blocked or delayed in an emergency. *See* App. C, at 3(a). Emergency vehicles have also blocked the road when responding to emergencies, as in the case of a structure fire in 2019, where fire trucks completely obstructed traffic in both directions. *Id*. at (b). The alternative of using smaller vehicles also poses danger, as this would increase congestion with more vehicle traffic entering a hazardous zone, which could also obstruct outgoing traffic during an evacuation emergency, given the narrow road with no turnouts. It is also unclear that school bus drivers would be allowed to enter hazardous zones under their current contract and OSHA restrictions. Accordingly, the plan to employ buses for evacuation needs further evaluation.

The proposal to rely on the proposed site's existing, below-standard bridge is also extremely concerning, particularly where large number of children could be affected by bridge failure.[12] The project envisions several vehicle parking spaces across the bridge from Cull Canyon Road, and relies on the bridge for pedestrian crossing and fire truck access to the site, should this be necessary. The potential for congestion during an emergency is not evaluated. The R-DEIR suggests that the substandard 14-foot bridge is not a problem, asserting incorrectly that a 20-foot access lane would extend all the way to the cabins. R-DEIR, p. 4.15-17. There is also no evidence that the local fire authority has signed off on this. *See* 14 C.C.R. §§ 1273, *et seq*.

[11] *See e.g.*, "How much does a school bus weigh?", https://weights.guide/school-bus-weight (last visited Jan. 12, 2024).

[12] In fact, FCVC members can attest that a previous bridge at the same site failed and was replaced by the current bridge.

(Fire Safety standards). The R-DEIR's further discussion of road capacity cites a "highway manual" and completely disregards the fact that Cull Canyon Road is not a highway, lacks shoulders and turnouts, and is not suitable for buses and large vehicles. R-DEIR, p. 4.15-17. The analysis is completely inadequate and fails to support the conclusion of no impact.[13]

In addition, the R-DEIR also provides no supplemental analysis to examine the condition of the bridge and its moorings in the wake of the extreme rainfall and atmospheric rivers of winter 2022-23. Cull Canyon experienced extreme flooding and erosion, as well as road damage in January 2023, as a result of severe weather. Some pictures of this damage are provided in Appendix C, at 1.[14] The river channel also eroded in many places, including at the proposed Mosaic site, as shown in Appendix C, at 2. The analysis of the stability and reliability of this structure is based on a Geotechnical report dated September 16, 2019, and has not been updated to ensure the bridge's condition and moorings remain stable. This report also states that it should not be relied on without further review if a period of 24 months has elapsed since the report date and the commencement of construction. R-DEIR App. E, p. *4 (cover letter), and p. 44 (*51). More than four years has elapsed since the report was prepared, indicating that it should not be relied on without further review.

Importantly, the issue of wildfire risk affects the health and safety of everyone who lives and works in Cull Canyon. There is only one evacuation route for all of the residents, making fire season an exercise in trust and shared responsibility. It is well-established that wildfire risk increases when more humans are present in the area, as "nearly 85% of wildland fires in the United States are caused by humans."[15] Campers may not fully appreciate the seriousness of this risk to lives and property. A fire at the Mosaic site would be devastating and likely would travel quickly due to steep hillsides and Canyon winds. The Columbia subdivision at the top of the ridge would also be at risk, which has not been evaluated. The risk to the entire community, and the children, demands a thorough analysis and weighs heavily against the wisdom of placing children in a high risk environment with limited options for evacuation.

C. The R-DEIR fails to provide an adequate analysis of transportation impacts.

As noted above, the R-DEIR fails to address vehicle weight restrictions on Cull Canyon Road. R-DEIR § 4.15-17; Appendix C, at 1. This issue also underscores the inadequacy of the R-DEIR's transportation analysis. § 4.12. Neither the transportation analysis nor Appendix I: Focused Traffic Study identifies the vehicle weight restrictions or provides any analysis of alternatives to school busses for transporting children to and from the project or for emergency evacuation plans. Accordingly, more analysis is needed to address these issues and examine the potential impacts of alternatives to using standard, full size school buses.

Notably, this issue also affects water trucks. The weight restrictions in the road, greatly limits the option of trucking out wastewater. A gallon of water weighs 8.33 lbs., which means a

[13] *See also*, Public Comment by Carolyn Millen (Jan. 18, 2024), noting fire hazards and lack of analysis.
[14] *See also*, Castro Valley Vibe, "Current road conditions" (Jan. 11, 2023), https://youtu.be/8sJLcXRiAew?feature=shared
[15] *See e.g.*, Nat'l Park Service, "Wildfire Causes and Evaluations," https://www.nps.gov/articles/wildfire-causes-and-evaluation.htm (citing 2000-2017 data based on Wildland Fire Management Information (WFMI) and U.S. Forest Service Research Data Archive (https://www.fs.usda.gov/rds/archive/catalog/RDS-2013-0009.4).

trick hauling 2000 gallons of water would weigh over 8 tons, exceeding the 7-ton weight restriction on Cull Canyon Road. The R-DEIR overlooks this restriction completely and fails to examine the limiting aspects of the narrow winding road, which is a significant obstacles to the feasibility of the project as currently designed.

More analysis is also needed to address wait time and emergency response in the event of a medical emergency. The narrow road could cause delays, which is not evaluated. It's also not clear if potential helicopter landing sites have been identified in the event that a life flight was needed. Improved emergency planning is needed to protect the health and safety of the campers.

D. The R-DEIR provides an inadequate analysis of potential impacts on site geology and soils.

The Project's analysis of potential impacts on geology and soils was also addressed in the previous FCVC comments on deficiencies of the DEIR, which are incorporated herein with one exception. See App. A § I.D. The R-DEIR does respond to one issue raised in previous comments; namely, the omission of supporting documents from the Geotech report. The R-DEIR supplements Appendix E: GeoTech by including the previously omitted data from nine soil trenches that informed portions of the 2019 geotechnical analysis. R-DEIR, App. E, pp. *74-82 (App. C to the GeoTech Report). The R-DEIR's analysis is otherwise unchanged.

In addition to comments raised previously, the R-DEIR fails to analyze the GeoTech reports recommendation that significant quantities of subsoil may need to be replaced to provide stable building footings for the project. In addition to expansive soils that would need to be replaced or compressed, the soil trench data also reveals a layer of unknown concrete and asphalt debris located at a depth of 3-5 feet below the surface in trenches 7-9, located at or near the site of the proposed multi-purpose building R-DEIR App. E, pp. 18, *80-82. The report recommends replacing expansive soils and excavating the debris layer, for removal or other treatment, to ensure a stable building surface. Id. at 18, 19-20, 23-25. The R-DEIR does not identify how the project proponents intend to address these issues and provides no analysis of whether soil replacement and treatment will cause additional impacts to soil erosion or loss of topsoil. R-DEIR at 4.5-13, -14 (GEO-2). There is also no discussion as to whether additional soil will be brought in, and if so, where this will be obtained and whether this will cause additional impacts.

As noted above, the 2019 geological report is also outdated and provides no analysis of site changes that may have occurred as a result of the extreme rain events during winter 2022-23, such as landslides and changes to the creek channel. Notably, these types of changes are documented by pictures and videos and also reported in other public comments, which show without doubt that the extreme rain events caused mudslides and channel modifications in other parts of Cull Canyon. Appendix C, at 1-2. There is also no analysis of the risk that children could fall down the steep banks along Cull Creek, or that banks could give way due to overhangs or erosion from flooding. The R-DEIR also fails to examine the possibility that children could be swept into the creek. Recent flooding also raises concerns about construction impacts along the creek, which could further destabilize soils, increasing potential erosion during future flood events.

The R-DEIR, however, downplays risks of flooding and landslides, but provides no updated information concerning the condition of the proposed site after the 2023 floods. The

stability of the steep hillsides above the proposed residential cabins, as well as proposed construction sites bordering both sides of Cull Creek, requires additional surveys to evaluate potential risks and to assess the adequacy of proposed setbacks and stormwater drainage plans. Evidence of landslides or changes to the creek channel may require substantial modification of the current site plan, squeezed between a steep hillside and a riparian zone.

Because the Geotechnical report was prepared in September 2019 and cannot be relied upon without further review after 2 years, an updated analysis is necessary to confirm that no significant changes to the site have occurred and the report's conclusions are still valid. R-DEIR App. E, pp. *4, and 44. The current analysis of Geology and Soils is thus inadequate.

E. The R-DEIR provides an inadequate analysis of potential impacts to Biological Resources.

The R-DEIR's analysis of biological impacts is inadequate because it fails to address potentially significant impacts to sensitive and protected species, including Crotch's Bumble Bee and Mountain lions. It also provides no information concerning the methodology used for site surveys to identify sensitive native plants and animals, or the location and distribution of sensitive plant species. The impact analysis also fails to address potential impacts stemming from the operation of the project, impacts of grading and soil replacement, vegetation and tree removal, and additional impacts of clearing 100-foot fire breaks around the new structures.

1. The R-DEIR fails to examine potential impacts to threatened and endangered species.

a. Crotch's Bumble Bee.

The R-DEIR states incorrectly that Crotch's Bumble Bee, Western bumble bee, and obscure bumble bee are not protected under state or federal Endangered Species Acts. R-DEIR at 4.3-15, -16. In fact, these bumble bee species are currently protected as candidate species under the California Endangered Species Act (CESA), Fish & Game Code §§ 2050 *et seq*., as of September 30, 2022.[16] Under CESA, species classified as a candidate species are afforded the same protection as listed species. 14 C.C.R. § 783.1.

While the R-DEIR acknowledges that occurrences of one or more of these endangered Bumble Bees have been reported in the Castro Valley area, it then concludes without supporting evidence that the presence of such bees at the project site is "highly unlikely" due to the absence of grassland or scrub habitat. R-DEIR at 4.3-16. However, the R-DEIR elsewhere indicates that some grassland and scrub species are present at the site. *Id*. at 4.3-7. In addition, guidance published by the California Department of Fish and Wildlife (CDFW), states that suitable nesting habitat for *bombus* species can include bare ground, abandoned rodent burrows or bird nests, brush piles, rock piles, and fallen logs, as well as manmade structures, and "leaf litter and woody forest edge" provide overwintering habitat.[17] In addition range maps for Crotch's Bumble Bee indicates that it could occur in this area, and that Western Bumble Bee historically occurred in

[16] CDFW, California Natural Diversity Database (CNDDB) (Oct. 2023), p. 5.
[17] CDFW, Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species (June 6, 2023), p. 3, and n.2.

this area.[18] CDFW's Bumble Bee survey guidance also cautions that the "[a]bsence of occurrence records should not be interpreted as absence of the species at or near a given site" and surveys "should be conducted" when there is suitable habitat in the area.[19] Moreover, "[i]t is important to assess habitat both within the proposed project area and in the surrounding landscape . . . [to] help predict whether candidate species could be nesting in adjacent areas and foraging within the project site" or vice versa.[20]

Here, the R-DEIR indicates that no site surveys were conducted to assess the presence of Crotch's Bumble Bee, or any other endangered bumble bee, or to assess the presence of suitable foraging or nesting habitat within the site and surrounding landscape. The R-DEIR should be updated to address this omission by conducting surveys in accordance with CDFW guidelines.

b. Mountain Lion.

The R-DEIR recognizes that Mountain Lions in the project vicinity are a protected species under CESA, and acknowledges that lions may use the project site, but nevertheless fails to examine the Project's potential impacts on Mountain Lions. R-DEIR § 4.3-15. Mountain Lion populations in Southern California and the Central Coast region, including the Central Coast Northern (CC-N) population which includes Alameda County, have been recognized as a candidate species under CESA since April 2020.[21] The R-DEIR affirms that Mountain Lions are known to forage in the area and "most likely forages and moves across the project site and surrounding areas," but provides no impact analysis, instead concluding without evidence that the site and surrounding natural areas are unsuitable for denning and not essential habitat. *Id*.

Given that Mountain Lions are likely to use the site and surrounding area, the Project's potentially significant impacts on Mountain Lions should be examined and mitigated. This includes potential impacts related to increased risk of human-lion conflicts, increased noise and human presence, and impacts to wildlife habitat corridors. Notably, the Project's proposed agricultural activities pygmy goats and chickens could attract mountain lions to the area and lead to conflicts or damage that requires nonlethal or lethal removal of such mountain lions. Pygmy goats released to graze the site, in particular, could be attractive to lions seeking an easy meal. Mature lions, once attracted to the area, could also pose a risk to children and adults; although attacks on humans are rare, they do occur, and generally require the destruction of the animal. These impacts require further analysis to evaluate the risk that lions will be attracted to livestock and develop appropriate mitigation measures. reduce the risk that livestock will attract predators and cause lion conflicts.

In addition, there is also a risk that increased noise and human activity could deter Mountain Lions from using the site as a foraging area or travel corridor. The extent to which Mountain Lions currently use the site is unknown, since no surveys have been conducted. Cull Creek is also "an important corridor for wildlife movement." R-DEIR § 4.3-17. More analysis is

[18] *Id*. at p. 11.
[19] *Id*. at p. 2.
[20] *Id*. at p. 3.
[21] Cal. Fish and Game Comm'n, Notice of Findings: Mountain Lion (Apr. 21, 2020); *see also* Center for Biological Diversity, et al., Mountain Lion Petition (June 25, 2019), https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=171208&inline.

needed to evaluate whether the noise and impacts from construction, and increased noise and human activity from the operation of the Project, will adversely impact the movement of Mountain Lions through the area. Further, the removal of trees and vegetation for grading, and the construction of fuel breaks around structures will also eliminate the cover available to wildlife, which could also impact wildlife movement through the area. The R-DEIR fails to examine these potentially significant impacts to mountain lions, or to evaluate feasible mitigation measures.

c. American Badger.

The R-DEIR concludes on the basis of undisclosed survey methods that badgers are unlikely to occur in the area, reasoning that "suitable grassland foraging habitat is absent from the proposed development area on the site and no evidence of dens or diggings by this species were observed during the field surveys." R-DEIR 4.3-15. However, many surrounding properties do have grasslands and local residents have reported sightings of badgers in the area to CDFW. One canyon resident also found skeletal remains of badger last year. See Appendix D. Accordingly, additional consideration is needed to evaluate whether badgers may use this area for foraging and to assess the need for appropriate mitigation. In addition, wildlife survey methodology, timing, and data should be fully disclosed.

d. Additional Inadequacies.

The R-DEIR also fails to provide any detailed information concerning the scope and methodology used for habitat assessment and plant surveys. The R-DEIR states that native plants were identified through a field reconnaissance survey conducted in March 2021, with follow-up surveys in April and May 2022, but does not disclose the actual data from these surveys showing the dates, locations, and frequency or distribution of the species that were observed. R-DEIR § 4.3-12. There is also no discussion concerning the rationale for the dates selected and whether any of the species screened for would have been difficult to observe at these times. *Id*. Appendix D provides a summation of results consisting of a list of plants that were screened for that indicates whether or not they were observed, but provides no details concerning frequency or distribution. R-DEIR App. D, pp. *3-6. As a result, it is impossible to determine which species are likely to be affected by the grading and clearing activities required by the Project. Notably, in addition to the grading required for building and road construction within the proposed building envelope, fire protection requires additional vegetation clearing extending 100 feet from the structures into surrounding habitat. R-DEIR, § 4.15-20. The Geotech report also indicates that grading required for construction should extend at least ten feet beyond the actual building areas to provide for drainage, also increasing the impact area. R-DEIR, App. E, § 6.1.13. The extent to these additional clearings will impact sensitive species or extend into riparian areas is also not disclosed or otherwise mitigated.

In addition, there is no evaluation of the potentially significant impacts of the proposed activity of grazing pygmy goats on 25 acres of the site. R-DEIR, Appendix K. Goats are relatively unselective herbivores, and grazing may impact sensitive native plants as well as weeds and invasive species. The potential impacts of grazing on native plant communities, sensitive species, and wildlife habitat are not examined anywhere in the R-DEIR.

Similarly, the R-DEIR also provides inadequate information concerning how and when

wildlife surveys were conducted. The R-DEIR states only that "[a] habitat assessment was conducted by the EIR biologist as part of the field surveys of the proposed development area." R-DEIR § 4.3-12. However, no documentation is provided concerning the dates, methodology, or data collected. Appendix D provides only a print-out of species information from the CNNDB database. R-DEIR App. D, pp. *7-16. There is no information from which to ascertain the scope of surveys or whether they were conducted at a time or times when species were likely to be present and observable. The CNNDB print-out also indicates that the reported information expired on Dec. 3, 2022, and is thus no longer reliable. *Id*. at *16.

The R-DEIR also fails to evaluate or mitigate the impacts of tree removal and increased noise on wildlife and birds using the area. The R-DEIR states that approximately 44 trees will need to be removed to make way for project construction, 32 of which are native oaks and redwoods. R-DEIR § 4.3-27. There is no analysis of whether this will impact migratory birds, or endangered birds, bats, or raptors using of the area. The R-DEIR also indicates that the project will generate significant noise, both during construction and as a result of the Project's activities bringing groups of 75-95 kids to the site for camping programs. R-DEIR § 4.10.3. However, there is no discussion of the potential impacts of noise on wildlife use of the area. The potential for large groups to further impair biological resources through trampling and incidental damage is not addressed.

In addition, the DEIR fails to evaluate the presence plants and wildlife that may pose a safety hazard to children. This includes wild pigs, which may use the site for foraging or grubbing. Given that pigs can be aggressive, often travel in groups, and forage at night, this could be a safety risk for children attending camp. Certain plant species also pose risks. Poison hemlock, in particular, is common in this area and can be fatal if ingested.[22] The absence of fences along site boundaries and waterways, while beneficial for wildlife, could also pose risks for children who encounter animals like wild pigs or lions when walking alone or in small groups.

F. The R-DEIR provides an inadequate analysis of noise impacts.

Deficiencies of the Project's analysis of impacts from noise was addressed in FCVC's previous comments on the DEIR. *See* App. A, § I.E. The DEIR failed to support its conclusion that noise generated by the project and its construction would have a less than significant impact on the environment, utilized an incorrect standard, and omitted key details from the impact analysis. *Id*. The proposed site also sits in a bowl that causes sound to amplify and echo. Because the R-DEIR makes no substantive changes to the analysis provided in the DIER (*see* R-DEIR § 4.10.3), those comments also apply to the R-DEIR, and are incorporated herein.

G. The R-DEIR fails to provide an adequate analysis of agricultural impacts.

FCVC's previous comments on the DEIR emphasized the Project's failure to comply with the Williamson Act, inconsistency with agricultural zoning and potential impacts on neighboring agricultural land uses. See App. A. §§ I.F and VI. Those comments also apply to the R-DEIR and are hereby incorporated.

[22] See "Poison Hemlock," https://www.inaturalist.org/taxa/52998-Conium-maculatum (last visited Jan 18, 2024.)

While the R-DEIR supplements the DEIR analysis with a new Appendix K that purports to establish the Project's compatibility with the Williamson Act, the addition provides surprisingly little detail concerning an activity here characterized as the primary purpose of the Project. R-DEIR, App. K. In fact, the primary purpose of the project is to build a residential camp to house the Mosaic Project's Outdoor Camp program, which is a well-established educational program that has never involved a significant agriculture component. Adding a garden and few goats and chickens does not make agriculture the primary purpose of the project. Rather, it appears that the proposal to sell CSA shares has been tacked on solely as a means to generate agricultural income in the effort to meet the requirements of the Williamson Act.

These deficiencies are further elaborated in section III, below.

H. The R-DEIR fails to provide adequate analysis of the Project's inconsistencies with zoning and land use policies.

The Project's analysis of impacts pertaining to land uses also overlooks key provisions of the applicable zoning code provisions and planning documents. R-DEIR § 4.9.3. This includes failure to comply with building requirements of Measure D, failure to comply with residential density restrictions, failure to comply with the riparian buffer zone, and inconsistencies with other general plan policies. These deficiencies were previously noted in FCVC's comments on the DEIR and also apply to the R-DEIR, and are therefore incorporated by reference. *See* App. A, §§ I.G, II.B, and III. These issues are also further elaborated in section IV, below.

In addition, the R-DEIR's analysis of land use impacts fails to evaluate the proposed Project's need for a variance. That is, while the project description notes that the site's existing single family home, the caretaker residence, required a variance due to restrictions on building density in Agricultural zoning districts. R-DEIR, p. 3-3. The variance was necessary because the parcel is only 37 acres rather than 100 acres, which is the minimum building site required in the Agricultural ("A") zoning district. *Id*. Accordingly, the Project's proposed plan to add an additional 8-bedroom residence, is likely subject to the same restriction and will require an additional variance. In other words, the proposed use is inconsistent with the A district's building density requirements. However, the R-DEIR fails to identify this issue, noting only that the existing house will require a site development review, while the Project will require a conditional use permit ("CUP").

The R-DEIR also fails to acknowledge that the previous variance and CUP for the site expired in 2003. R-DEIR at p. 3-3; LUP-2. This is detailed in a Zoning Verification Letter for the property, which notes that Variance V-11293 and CUP C-7540 expired in January 2003, and "the subject use does not have continued conditions of approval [and] is not a conforming use."[23] However, the Land Use analysis omits this information completely and suggests that the proposed use complies with local planning and zoning requirements. It also fails to explain whether an additional variance will be necessary, or why the additional residential building would be exempted from this requirement. There is also no discussion of Measure D, Section 19(c), which prohibits variances for uses inconsistent with Measure D.

[23] Alameda County Community Devlpt. Agency, Revised PLN2018-00027 – Request for a Zoning Verification Letter (for the property at 17015 Cull Canyon Road, APN 085-1200-001-16) (March 15, 2018).

For the above reasons, the R-DEIR fails to provide sufficient evidence and analysis to inform decision-makers and members of the public of the Project's potentially significant environmental impacts, as required by CEQA.

II. The R-DEIR Fails to Provide an Adequate Description of the Environmental Setting.

Under CEQA Guidelines section 15125(a), an EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. 14 Cal. Code Regs. § 15125(a). An EIR's description of this environmental setting should be sufficiently comprehensive to allow the project's significant impacts "to be considered in the full environmental context." 14 Cal. Code Regs. § 15125(c). This should also highlight "environmental resources that are rare or unique to that region and would be affected by the project."[24] The environmental setting should also address "any inconsistencies between the proposed project and applicable general plans, specific plans and regional plans." 14 Cal. Code Regs. § 15125(d).

Here, like the DEIR, the R-DEIR's description of the environmental setting fails to describe significant features of the regional setting that have a bearing on the project's potentially significant impacts. For this reason, FCVC's previous comments addressing these deficiencies of the DEIR are also applicable to the R-DEIR and are incorporated herein. *See* App. A. § II. This includes the failure to adequately describe the project's physical setting and important limitations of Cull Canyon as well as failure to adequately describe how the project is situated amidst existing land uses.

FCVC's previous comments identified four physical limitations affecting the project setting that are not clearly addressed in the DEIR or R-DEIR: (1) Steep terrain and lack of secondary access roads increases fire risk; (2) Limited water sources and a confined aquifer that have already caused water shortages in the area; (3) Cull Creek is subject to flash floods, which may pose safety hazards; and (4) Risk of liquefaction and seismic features throughout the canyon may impair access/evacuation routes independent of risks on the project site. App. A. § II.A. In addition, Cull Canyon Road is narrow, lacks shoulders or turnouts, and is prone to flooding and landslides, which affects ingress and egress for the canyon's entire population. App. C. These limitations affect the lands surrounding the project site, as well as the project site, and are not adequately addressed in the R-DEIR.

The previous comments also address the DEIR's, and R-DEIR's, failure to adequately describe the rural and the agricultural character of the environmental setting, including legal protections enacted to preserve this character, including: (1) Alameda County's agricultural zoning designation; and (2) Measure D. App. A. § II.B. These zoning and land use restrictions are inconsistent with a high density residential camp involving more than 100 people. Notably, the existing caretaker residence had to be approved under a variance because even a single residential home violates the applicable zoning requirements, which only allows residential use on parcels of 100 acres. The proposed Project would add another larger residence as well as facilities to house and feed 108 campers. While the proponents seek to pass this off as a

[24] *Id.*

"recreational use" allowed under the Agricultural zoning designation, this ignores the distinction between low-intensity and high-intensity recreation. For example, playing ball in a field is distinguishable from building an indoor stadium. Similarly, building hiking trails and tent campsites would retain the natural character of the land, while in contrast, building a large, 8-bedroom home, with twelve permanent cabins, and a large multi-purpose building would not preserve the land.

Thus, much like the earlier DEIR, the R-DEIR, fails to provide a full and informative description of the environmental setting that recognizes and addresses these important limitations.

III. The Project Fails to Comply with the Williamson Act.

As noted above with respect to Agricultural impacts inadequately addressed in the R-DEIR, the Project fails to comply with the Williamson Act.

A. The Project's primary purpose is not commercial agriculture.

Pursuant to Uniform Rule 1 of Alameda County's Eligibility Requirements for Agricultural Preserves and Williamson Act Contracts for Agriculture, "the contracted land must be devoted to commercial agriculture as the primary use of the land." Uniform Rule 1, § I.C. In addition, for parcels under 40 acres, "if compatible use is proposed, at least 50% of the parcel must be used for commercial agriculture to ensure that any development is incidental to the agricultural use." *Id.* § I.C.3.(b)(3).

Here, although R-DEIR Appendix K purports to establish otherwise, the Project's primary purpose is not commercial agriculture. Notably, the Mosaic Project's mission has nothing to do with agriculture. The Mosaic Project website describes their actual mission, which is focused on developing skills of community building, empowerment, and peacemaking.[25] The Outdoor Project is described as "immersive, experiential education program" with an "evidence-based, social-emotional learning curriculum is designed to address issues of difference, build self-esteem, and inspire inclusion."[26] There is no mention of agriculture. While the DEIR and R-DEIR include an agricultural element, there is no serious question that the primary purpose of the project is educational, and the overriding goal of the Proposed Project is to establish a permanent site for the Outdoor Project, by building an Outdoor Project Camp. The Project's founder has also stated publicly that the Outdoor Camp is a school and not a summer camp.[27]

Notably, the R-DEIR provides no analysis of how agricultural products will be processed and prepared for distribution, and no discussion of a sanitary facility for preparing goats' milk and cheese for CSA boxes and consumption by children attending camp.[28] There is also no analysis of the water supply required for the Project's agricultural component. In fact, the R-DEIIR's impact analysis states that the Project proposes to rely entirely on gray water and rainwater for irrigation and agricultural activities, but provides no analysis of rainwater

[25] Mosaic Project, "Mission," https://mosaicproject.org/about/mission/ (last visited Jan 14, 2024).
[26] Mosaic Project, "Outdoor Project," https://mosaicproject.org/outdoor-project/ (last visited Jan 14, 2024).
[27] *See e.g.*, Public Comment by Cull Canyon Resident Teddy Seibert (Jan. 18, 2024),
[28] *Id.,* noting the R-DEIR's failure to include a serious analysis of the facilities, equipment, and procedures needed to conduct the proposed commercial agricultural activities.

catchment or quantity needed to accomplish these objectives. Moreover, there appears to be no contingency plan for drought years where sufficient water may not be available, suggesting that the agricultural purpose would need to be abandoned if not adequately supported by rainwater. These omissions would appear to be highly unusual if the primary purpose of the project was in fact agricultural production, and not an educational children's camp in keeping with the applicant's mission.

Further, the decision to use at least 50% of the land for grazing goats is also accompanied by no rationale or analysis of potential impacts to native plants or wildlife habitat. Appendix K simply states that 25 acres of the 37-acre site will be grazed, but provides no analysis to support this arbitrary figure. Again, this appears to be devised solely for the purpose of tacking on an agricultural component in the effort to shoehorn an educational project into the constraints of the Williamson Act.

B. The Project does not meet the Williamson Act's building restrictions.

Compatible uses under the Williamson Act must also meet the requirements of Uniform Rule 2, which requires buildings to comply with maximum building intensity and 2-acre building envelope requirements, consistent with Measure D and the A-Designation. Uniform Rule 2, § I.B. That is, all residential and residential accessory buildings "shall have a maximum floor space of 12,000 square feet" and all buildings "shall be located on a contiguous rectangular building envelope not to exceed 2 acres." *Id*. Residential units on contract lands are also restricted to habitation by owners, immediate family members, agricultural employees, seasonal laborers, or caretakers. *Id*. § II.A.1. In addition, passive recreational use "is limited to land in its agricultural or natural state." *Id*. § II.C.2.a.

Here, the Project's proposed buildings are not fully contained within a contiguous *rectangular* 2-acre proposed buildings requirements. As shown in Figure 3-4 of the R-DEIR, the purported building envelope is shaped more like a guitar than a rectangle. While the main cluster of buildings on the west side of the creek appears to be laid out in a more or less rectangular pattern, the "envelope" boundary then traces the road across Cull Creek and widens again to encompass the mobile home site and parking areas on the east side of the creek. This requirement therefore is not met.

In addition, if the cafeteria/mess hall building is recognized as a residential accessory building, as the sole kitchen and dining hall for guests residing in the cabins, then the total residential floor area is 18,173 sq. ft., which exceeds the allowable floor space of 12,000 sq. ft.

It also appears highly unlikely that the Project can comply with the further requirement that all residential buildings be occupied by the property owner, an immediate family members, or agricultural caretakers, or agricultural workers or laborers. Neither the R-DEIR nor Appendix K addresses this issue. While the caretaker residence may meet this requirement, the Project description indicates that the staff residence will be occupied by Mosaic Project staff, at least some of whom are more likely to be educators or Outdoor Project staff rather than agricultural workers. In addition, the cabins provide temporary housing for students and educational support staff or volunteers that are not agricultural workers. Therefore, the Project fails to comply with the Williamson Act.

IV. The Proposed Project is Inconsistent with Applicable Zoning Requirements and Land Use Plans.

As noted in FCVC's comments on the DEIR, the proposed Project fails to comply with important zoning code provisions and applicable land use plan policies. This includes the building intensity restrictions imposed by the A District zoning designation and Measure D. *Supra* §§ I.G, III.B. Additional inconsistencies identified in the DEIR also apply to the R-DEIR and are incorporated here by reference. *See* App. A. § III.

Pursuant to Government Code section 65860, zoning and land use approvals must be consistent with the policies and requirements of the applicable general plan. Land use approvals must also comply with the applicable zoning ordinances.

As noted previously, the Castro Valley General plan designates Cull Canyon as an area where special planning efforts are needed to address unique features, including biological resources and steep terrain. The plan states that "development in this area should be limited to protect these sensitive areas." Castro Valley General Plan at 3-12 (March 2012).

Notably, the proposed Project is still inconsistent with Alameda County General Plan ("ACGP") policies concerning fire safety. In particular, Countywide Safety Element, Policy 8, provides that "[t]he County shall limit residential development to very low densities in high fire hazard zones identified in Figure 5.," which clearly includes Cull Creek Canyon and the proposed site. Countywide Safety Element, pp. 25, 30. The East County Area Plan ("ECAP") states similarly that '[t]he County shall limit residential development to very low densities in high fire hazard zones as identified by the Fire Hazard Severity Scale." ECAP, p. 76. Because the prosed project is not low-density it conflicts with these general plan policies.

In addition to those points incorporated by reference, the proposed Project also appears to violate the County's Watercourse Ordinance, by including road construction within the riparian setback, or buffer zone. Alameda Cty. Code § 13.12.310-320. This is evident in R-DEIR Figure 3-4, where the road appears to cross more than 15 feet into the setback area. Notably, this fails to address additional impacts from grading to prepare the roadbed and stabilize the shoulders of the proposed road. The proposed parking area on the east side of the creek near the bridge also appears to touch or cross the setback boundary, indicating that construction activities may cross into this area. These violations increase risk of soil erosion and sediment pollution, which is also contrary to Castro Valley General Plan Policy 7.1-5 Riparian Habitat: "New development shall not disturb any riparian habitat." Castro Valley General Plan, at 7-11.

Thus, the updated Project remains inconsistent with multiple zoning ordinances and general plan policies.

V. The R-DEIR Fails To Consider an Adequate Range of Alternatives.

The R-DEIR fails to consider an adequate range of alternatives to the proposed project. It not only fails to consider any alternative locations, but also fails to support its conclusion as to the Environmentally Superior Alternative.

Pursuant to CEQA Guidelines, the "key question and first step in analysis is whether any

of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR." 14 Cal. Code Regs. § 15126.6(f)(2)(A). If the lead agency concludes that no feasible alternative locations exist, "it must disclose the reasons for this conclusion, and should include the reasons in the EIR." 14 Cal. Code Regs. § 15126.6(f)(2)(B).

Notably, "[t]he process of selecting the alternatives to be included in the EIR begins with the establishment of project objectives by the lead agency. A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings." *In re Bay-Delta*, 43 Cal.4th 1143, 1163 (2008) (internal citations omitted). Project objectives may not be so narrowly defined that no other alternatives can be considered. *We Advocate Thorough Envtl. Review v. Cty. of Siskiyou*, 78 Cal. App. 5th 683, 692-93 (2022). Rather, the failure to consider any other site is prejudicial because "it dismissively rejected anything other than the proposed project . . . [thereby] prejudicially prevent[ing] informed decision-making and public participation." *Id*. at 693.

Here, although the R-DEIR considers one additional alternative as compared to the DEIR, it still fails to evaluate any alternative location for the project. R-DEIR, 5-3. As with the DEIR, the only rationale offered for rejecting an alternative location states: "An alternative location for the proposed project was considered infeasible due to availability of sites that would support the project's objectives." *Id*. Again, there is no indication of any effort to identify alternative locations or identification of sites that were considered but found infeasible. Instead, the possibility of an alternative location is dismissed without evidence of due consideration.

Accordingly, the failure to examine alternative sites, as elaborated in FCVC's comments on the DEIR also applies to the R-DEIR, and are incorporated here by reference. *See* App. A, § V.

In addition to the "No Project Alternative," the R-DEIR considers the Reduced Capacity Alternative"(formerly called the "Reduced Development Alternative") and adds an additional option called the "Reduced Building Footprint Alternative." R-DEIR, 5-3. While the Reduced Capacity would reduce the building footprint and lower the number of students in each program from 95 to 50, the Reduced Building Footprint Alternative would modify the site plan by moving the council ring out of the riparian setback and reducing the building size but still maintain 95 students in each camp program. *Id*.

The analysis of alternatives concludes that the Reduced Building Footprint Alternative is the Environmentally Superior Alternative, because it would allow the same number of students to attend the program. Notably, this fails to consider the potential benefits of the Reduced Capacity Alternative in relation to water supply and hydrology, or limitations on using large buses for transportation and emergency evacuation plans. Fewer participants could also reduce potential noise impacts on neighbors and wildlife. Clearly, a smaller population intensity could reduce a variety of potential impacts. However, despite admitting that both alternatives would meet *all* of the Project's objectives, the Reduced Capacity Alternative was rejected solely because it would not serve as many students. R-DEIR, 5-22. The R-DEIR fails to explain how a larger number of students using water and creating waste, for example, would not result in

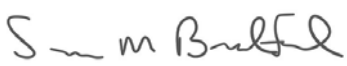
greater environmental impacts than a smaller number. Accordingly, the conclusion appears to be illogical and arbitrary.

In sum, none of the alternatives considered address the larger issues of housing the camp in a box canyon with high fire risk, no secondary evacuation routes, and a limited water supply. Nor does the analysis of alternatives explain why no alternative sites were considered. As a result, the analysis of alternatives is inadequate and prejudicial.

VI. CONCLUSION

For the foregoing reasons, the R-DEIR is inadequate. It fails to disclose critical information or to provide supporting evidence for its conclusions, and fails to provide an adequate evaluation of potentially significant environmental impacts, as well as hazardous conditions that could affect the health and safety of Project participants and area residents. The Mosaic Project's educational programs merit a better location with adequate access routes, adequate water supply, fewer safety hazards, and fewer environmental impacts.

Sincerely,



Susann M. Bradford
Greenfire Law, PC

Enclosures:

Appendix A: FCVC Public Comment on The Mosaic Project Draft EIR (Nov. 21, 2022)

Appendix B: Water Supply Comments by Roux Associates, Inc.

Appendix C: Flooding and Road Hazards

Appendix D: Appendix D: Evidence of Badger Activity in Area

Appendix A

FCVC Public Comment on The Mosaic Project Draft EIR (November 21, 2022)

GREENFIRE LAW, PC

JESSICA L. BLOME
2748 Adeline Street, Suite A
Berkeley, CA 94703
Phone: (510) 900-9502
Email: jblome@greenfirelaw.com
www.greenfirelaw.com

November 21, 2022

By Electronic Mail

Sonia Urzua, Senior Planner
County of Alameda, Planning Department
224 W. Winton Avenue #111
Hayward, CA 94544
Email: sonia.urzua@acgov.org

RE: Public Comment; The Mosaic Project Draft EIR (October 2022), SCH No. 2021110301

Dear Ms. Urzua, et al.,

Thank you for the opportunity to comment on The Mosaic Project Draft EIR ("DEIR"). The following comments are submitted on behalf of Friends of Castro Valley Canyonlands ("FCVC"). FCVC is an association of concerned citizens and Alameda County residents who advocate for the protection and preservation of the agricultural character and unique qualities of the Castro Valley Canyonlands.

In this comment, FCVC identifies significant deficiencies in the DEIR's analysis of the proposed project, multiple inconsistencies with applicable planning documents, and potential violations of state and local law. The DEIR fails to inform decision-makers and the public of all the potentially significant environmental impacts the project is likely to have, fails to provide substantial evidence supporting several of its conclusions, fails to identify inconsistencies with the Alameda County General Plan ("General Plan"), Castro Valley Area Plan ("Area Plan"), East County Area Plan ("ECAP"), and fails to address restrictions imposed by state law and County ordinances. The DEIR also fails to provide for alternative sites, including potential sites within the Urban Growth Boundary applicable to the Castro Valley Canyonlands.

In addition, FCVC previously requested that the County release the proponent's hydrological study prepared by Balance Hydrologics, which is referenced in the DEIR at Section 4.14.1.2 but not included in the DEIR as an attachment or within the appendices.[1] FCVC and this

[1] DEIR at 4.14-5.

firm formally request that the County extend public comment to allow public review and comments on this critical document, which has yet to be released. Because California Environmental Quality Act ("CEQA") requires that a DEIR must "[i]nform governmental decision makers and the public about the potential, significant environmental effects of proposed activities,"[2] omitting "material necessary to informed decision making and informed public participation" subverts the purposes of CEQA and is a fundamental and prejudicial error.[3] There can be no doubt that the County's failure to produce a complete Draft EIR for public review and comment renders any future decision approval of a final EIR vulnerable to vacatur and reversal upon judicial review.[4]

I. The DEIR fails as an informational document because it fails to provide sufficient analysis and supporting evidence from which to evaluate the project's potential environmental impacts.

An "EIR must include detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project."[5] The present DEIR fails to provide key information in several subchapters of its assessment of potential environmental impacts.

A. The DEIR omits key information concerning the proposed site's hydrology and available water supply.

The DEIR omits key information concerning the proposed site's hydrology. The DEIR states that "Balance Hydrologics was retained to conduct groundwater exploration and identify potential water supply sources for the project."[6] However, only conclusions are described and the actual study on which these are based is not provided. As a result, the proponent's claim to have secured an adequate water supply for the project is not supported by substantial evidence.

Moreover, due to the County's failure to produce the Balance Hydrologics report with the Draft EIR, FCVC's environmental consultant, Dr. Andrew Zdon with Roux Consulting Services, could not complete his review of the Draft EIR before the comment deadline ended on November 21, 2022. I am attaching a letter Dr. Zdon prepared highlighting the information the Draft EIR appears to have failed to consider, while lamenting the fact that he could not complete his review of the Draft EIR due to the missing report.[7] Indeed, the hydrology report would have contained several pieces of critical information related to well depth, groundwater levels, and hydrologic connections between groundwater and surface water that are necessary to inform any analysis on water availability for both routine and emergency uses and pollution pathways. The County simply must release the report and allow the public time to review and consider the information within it before it can close the comment period on the Draft EIR.

---

[2] 14 Cal. Code Regs, § 15002(a)(1) (14 Cal. Code Regs., §15000-15387 are referred to hereafter as the "CEQA Guidelines").
[3] *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 946 (citations omitted).
[4] *Id.*
[5] Cleveland Nat. Forest Foundation, 3 Cal. 5th 497, 511 (2017).
[6] DEIR at 4.14-5.
[7] Attachment A: Andy Zdon, Roux Associates, Inc. Memorandum Re: Water Supply Comments (Nov. 17, 2022).

1. A transparent analysis of site hydrology is necessary to identify whether the project has identified a sufficient water supply.

Before approving any project, the County must determine that sufficient water is available to support the proposed use and satisfy all public health and safety mandates, including fire flow requirements.[8] The County also has an affirmative duty to protect the health and safety of existing residents, as well as the public rights to drinking water and the protection of public trust resources.[9] The DEIR fails to provide sufficient information to make these determinations.[10]

The DEIR states that the two existing onsite wells have the combined capacity to produce 7.7 gallons per minute (gpm), which equals 462 gallons per hour.[11] The DEIR concludes that these wells, combined with storage tanks, limited rainwater catchment, and seasonal greywater, are sufficient to provide an adequate water supply for the proposed project. However, these conclusions are not adequately explained due to the omission of supporting documentation.

The DEIR also fails to provide clear support for its estimates of projected daily water use associated with the project. The DEIR is consistent with County guidelines in estimating 150 gallons per day (gpd) per bedroom for the 9-11 bedrooms of the proposed residences but adopts a much lower estimate of 25 gpd per person for the 108 cabin occupants.[12] The reason for this is unclear but references the sewage outflow estimates utilized in Appendix G, the wastewater treatment system analysis.[13] A close inspection of this source shows that the estimate is not for daily water demand at all, but is based on estimated wastewater flows for a "pioneer type" campground,[14] which is not defined, but appears to refer to rustic campsites that may have toilets and a spigot for water, but no other plumbing or access to showers or kitchens.[15] Because the proposed project includes flush toilets and showers for all of the camp participants, as well as access to a community kitchen, this estimate is outrageously low.

Because the cabins are essentially additional dormitory-style bedrooms that each sleep up to ten people, whereas a standard bedroom would typically sleep 1-2 people, it would appear more reasonable to estimate water use based on an equivalence of each cabin to 4-5 bedrooms. Even a conservative estimate that equates each cabin to only 2 bedrooms per 10 people would increase the estimated daily water demand by 180 gpd, while treating each cabin as the equivalent of 3 bedrooms per 10 people would double the DEIR's current estimate from 2700 gpd to 5400 gpd, not including the additional 1360 gpd estimated for nine bedrooms in the permanent residences.[16]

In addition, the water supply calculations make no mention of fire flows. While the DEIR suggests that rainwater and graywater would offset demand for irrigation water, this has no

[8] Cal. Water Code § 10910; *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal. 4th 412, 433 (2007).
[9] *See* Water Code § 106.3; *Envtl. Law Found. v. State Water Res. Control Bd.*, 26 Cal. App. 5th 844, 859 (2018).
[10] Attachment A: Andy Zdon, Roux Associates, Inc. Memorandum Re: Water Supply Comments (Nov. 17, 2022).
[11] DEIR at 4.14-5.
[12] DEIR at 4.14-6 to 4.14-7.
[13] *Id.*
[14] USEPA, Onsite Wastewater Treatment Systems Manual, Table 3-6, at p. 3-9.
[15] *See e.g.*, Georgia Dept. of Natural Resources, State Parks and Historic Sites, "Primitive Camping," http://explore.gastateparks.org/primitive-camping (last visited Nov. 18, 2022).
[16] 108 x 25 gpd = 2700 gpd; whereas 24 x 150 gpd = 2880 gpd; and 36 x 150 gpd = 5400 gpd.

bearing on the overall demand from the wells, which does not appear to include irrigation water for the garden or stock water for livestock. Given that rainwater is unlikely to last for the entire dry season, and neither food crops nor animals can use graywater, the overall demand estimates also appears to omit agricultural uses altogether.[17]

Overall, the DEIR's numbers appear to be completely unreliable and to egregiously underestimate the average daily demand as well as peak demand, or maximum daily demand, which the DEIR inexplicably asserts is just 3975 gpd.[18] Notably peak demand is the critical factor for ascertaining the adequacy of the water supply. The DEIR goes on to base its conclusions concerning the adequacy of the water supply on these extremely low estimates of actual water use. In addition, the DEIR appears to omit any consideration of how many hours a day the water pumps would operate and whether this would limit the overall daily supply.

In sum, the DEIR is inadequate because it fails to provide sufficient information from which to determine whether the onsite wells comprise an adequate water supply. Without a hydrologic analysis or a reasonable estimate of peak demand, there is no way to tell if the water supply is sufficient to meet the public health and safety requirements, including fire flows.[19]

2. A transparent analysis of site hydrology is necessary to evaluate the potential impacts of proposed wells on underlying groundwater, other water users, and Cull Creek.

The proposed use of well-water as a primary water supply for more than a hundred additional residents, or guests equivalent to residents, will inevitably have some impact on available groundwater. Cull canyon has a limited aquifer that is shared and relied on by the other valley residents and agricultural water users. Previous comments submitted by residents indicate that well-water is already at risk in this canyon and subject to seasonal variations that can adversely impact agricultural uses. For example, local landowner Rex Warren reported drilling two new wells recently that both came up dry, which forced him to reduce the number of cattle he produces.[20] The amount of water necessary to support the project may further impair the availability of groundwater and exacerbate these types of problems. The DEIR lacks sufficient analysis of the aquifer and site hydro-geology from which to assess the likely impact on neighboring water users and residential wells.

A transparent analysis of site hydrogeology is also necessary to assess the interconnection between the site's groundwater wells and surface waters.[21] Depleting groundwater by pumping thousands of gallons per day may have a direct impact on surface waters in Cull Creek. Wells located near creeks, and in shallow water tables, can create cones of depression that draw in

[17] Failure to consider agriculture in the context of water supply also suggests that the proposed agricultural use is not a primary objective of the project.
[18] DEIR at 4.14-7.
[19] **Attachment A**: Andy Zdon, Roux Associates, Inc. Memorandum Re: Water Supply Comments (Nov. 17, 2022).
[20] Rex Warren, Public Comment Re: Notice of Preparation of and Environmental Impact Report (EIR) - PLN2020-00093 (Dec. 19, 2021).
[21] USGS California Water Science Center, Sustainable Groundwater: Interconnected Surface-Water Depletion, https://ca.water.usgs.gov/sustainable-groundwater-management/interconnected-surface-water-depletion.html (last visited Nov. 18, 2022).

subterranean creek waters causing reduced surface flows.[22] The U.S. Geological Survey's Circular on "Streamflow Depletion by Wells" is provided as Attachment B.[23] One of the project's proposed wells is within one hundred feet of Cull Creek, and the other is within a few hundred feet.[24] Decreased surface flows could have a significant adverse impact on wildlife and downstream surface water users. This watershed also feeds the County's urban water supply. An adequate analysis of site hydrology is therefore critical to protecting the health and safety of existing residents, as well as the public rights to drinking water and the protection of public trust resources.

3. A transparent analysis of site hydrology is necessary to evaluate the potential impacts of the project's proposed septic system.

The proposed project also includes plans for a septic system to treat wastewater from more than 100 people per day. The proposed location of the septic system is within two hundred feet of Cull Creek.[25] Based on the DEIR's Geotechnical Engineering Investigation Report, localized groundwater data indicates that the water table is very high, only 30-40 feet.[26] This suggests a potential risk that contaminated wastewater could come in contact with the shallow aquifer. If the drainage area is connected to the creek by underground flows, this could also bleed into surface waters. Cull Creek is also subject to seasonal flooding, which further increase the risk that flood water could contaminate wells or cause wastewater to become exposed to groundwater.[27] The proponent's analysis of the proposed septic system evaluated soil samples but did not examine subsurface flows or hydrogeology.[28] Given the proximity of the septic system to the creek, a thorough analysis of the site's hydrogeology is necessary to assess potentially significant impacts of the proposed onsite septic system on groundwater and surface waters.

Accordingly, the DEIR is inadequate because failure to disclose hydrologic studies undermines the sufficiency of the DEIR as an informational document. Without this information, neither decision-makers nor members of the public can make informed determinations concerning whether the project has sufficient available water, whether the proposed use will deplete groundwater causing significant adverse impacts on other water uses, or whether the proposed septic system will threaten water quality. Unless this information is provided promptly and the current comment period extended to allow for adequate review, as requested by FCVC, the DEIR should be amended with this information and recirculated for additional public comment to address this substantial omission.

---

[22] *Id.*
[23] **Attachment B**: USGS Groundwater Resources Program Circular 1376, *Streamflow Depletion by Wells—Understanding and Managing the Effects of Groundwater Pumping on Streamflow* (2012).
[24] DEIR, Figure 3-4, Proposed Project Site Plan.
[25] Proposed Site Plan, DEIR Figure 3-4.
[26] DEIR at 4.8-11; DEIR Appendix E: Geotechnical Engineering Investigation Report, at 12-13.
[27] EPA, Septic System Impacts on Water Sources, https://www.epa.gov/septic/septic-system-impacts-water-sources (Aug. 23, 2022).
[28] DEIR Appendix G: Wastewater Basis of Design, at 9.

B. The conclusion that the proposed project would have less than significant impacts on fire risk and public services is not evident from the DEIR.

The DEIR includes a fire plan that consists of drills and training but fails to fully examine the substantial increase in fire risk that the project would impose,[29] both on the camp participants and staff and on surrounding residents. The location of the site is in a high fire risk zone in a terminal box canyon with a single access road,[30] which currently constitutes the sole evacuation route for approximately 140 residents. Bringing another 119 people into this canyon, the majority of whom are children, will substantially increase the risk to the entire community.

The project relies on a training program and fire drills to reduce the risk, and a plan to bring busses to the site if and when an evacuation is required.[31] The busses would not be stationed at the site but would need to travel several miles from a local school to arrive at the site in the event of an emergency. This plan fails to account for potential traffic hazards, including emergency vehicle traffic, other residents evacuating, large vehicles evacuating livestock, livestock or debris in the road, and the possibility that the road could be blocked by fire. There are many factors that could delay or prevent school busses from reaching the site promptly. Even if there was sufficient parking space to keep dedicated busses onsite when children are present, a smooth evacuation could still be impaired by potential road obstructions. The proposed plan also fails to address the speed with which wildfires can travel through steep woody areas such as the proposed site and surrounding areas. Placing children in this situation in the belief that fire drills would be adequate to reduce the risk of fire danger is irresponsible.

The DEIR also fails to provide evidence that the proposed water supply would be adequate to meet fire flow standards.[32] This requires a sufficient volume and higher water pressure than standard plumbing. While the DEIR asserts that these standards will be met, this is impossible to verify without access to a detailed hydrologic analysis of well capacity, that addresses seasonal variations, peak flows, and possible impacts related to wells on neighboring properties. Notably, the County Environmental Health Department has identified Cull Canyon as an area of concern for groundwater replacement due to steep rocky terrain,[33] and the proposed site and wells are situated at the base of a steep hillside.

The impact analysis also fails to support its conclusion that the proposed project would have less than significant impact on public services. The DEIR acknowledges that the project would have as many as 119 people on site during programs, but nevertheless concludes that this would have a less than significant impact on existing Fire Department resources.[34] This conclusion is not supported by any substantive analysis. The DEIR recites some facts about average response times and the distance to the nearest station, and then asserts without explanation that the proposed fire plan will be adequate because the residential camp programs are not continuous.[35] There is no analysis of how this substantial increase in population could impact the larger community or potentially strain fire department resources in event of a wildfire

[29] DEIR, Appendix F: Draft Fire Safety and Emergency Response Plan.
[30] Castro Valley General Plan, Figure 10-1.
[31] DEIR at 3-24 to 3-26.
[32] *See* DEIR section 4.14.1.4.
[33] LAMP, Table 2-4, at 27.
[34] DEIR at 4.11-6 to 4.11-7.
[35] DEIR at 4.11-7.

emergency. There is also no analysis to explain how the short gaps between programs, and change in participants from week to week, would reduce or eliminate the potentially significant impact on emergency services during the periods when the residential programs are in session.[36] The DEIR's conclusion that the project would have a less than significant impact on fire department services is unsupported by substantial evidence.

The DEIR is similarly dismissive of any potential impact on local police services.[37] The DEIR provides no analysis of the potential need for additional police services in the Canyon due to the influx of 119 people. Instead, the report asserts that any impact would be less than significant because the children and staff live somewhere in the County. This fails to consider the potential need for police response to issues that could arise from bringing a large number of children into a concentrated area at a remote site with no medical or security facilities. The report also fails to consider potential safety issues related to siting a residential camp for children next to a drinking establishment, such as drunk driving. There is no discussion as to whether this might warrant additional patrols or other measures that would impact police services. Accordingly, the DEIR fails to provide a reasoned basis for its conclusions that the project would have less than significant impacts on fire risk and public services.

C. The DEIR's conclusion that the proposed waste treatment system would have less than significant effect on the environment is not evident from the DEIR.

The sufficiency of the project's proposed septic system is not supported by substantial evidence. The project proposes to upgrade the existing septic system with an onsite waste treatment system ("OWTS") that would be designed to accommodate a flow of 3525 gallon per day ("gpd"), based on an estimated average daily flow of 2820 gpd.[38] Although this flow capacity is based in part on a site investigation, the estimates for daily flow appear to be significantly less than those recommended in the Alameda County Local Management Program for OWSTs ("LAMP"). An adequate justification for the lower estimates is not explained in the supporting documents of the DEIR.

As discussed above, the sewage outflow estimates are based on DEIR Appendix G, the wastewater treatment system analysis.[39] Appendix G indicates that the estimates used in the report are based on average wastewater flows for a "pioneer type" campground, which is only 25 gpd per camper.[40] As noted above in Section I.A.1, pioneer camping typically refers to a rustic campsites with limited amenities such as pit toilets and a spigot for water, but no showers or kitchens.[41] Because the proposed project includes flush toilets and showers for all of the camp participants, as well as access to a community kitchen, this estimate is outrageously low. Notably, the EPA source document that Appendix G relied on estimates wastewater flows for boarding schools at the much higher rate of 75 gpd per student,[42] which would be 8100 gpd for 108 campers. The DEIR fails to explain why the lower estimate was used and fails to show that the estimates are reasonable or based on substantial evidence. As a result, the DEIR fails to show

[36] *Id.*
[37] DEIR at 4.11-8
[38] DEIR at 4.8-18; Appendix G: Wastewater Basis of Design at 9.
[39] Appendix G: Wastewater Basis of Design at 9.
[40] *Id.*
[41] USEPA, Onsite Wastewater Treatment Systems Manual, Table 3-6, at p. 3-9.
[42] *Id.* Table 3-5, at p. 3-8.

that the proposed septic system is sufficient to meet the needs of the proposed project.

In addition, the LAMP indicates that Cull Creek Canyon is a potential area of concern due to "[d]evelopment in steep-sided canyon, rocky soils, steep terrain, encroachment within stream terraces, [and] limited replacement area."[43] It also estimates the combined discharge from 36 other existing OWTS units in Cull Creek Canyon is approximately 5400 gpd, based on 150 gpd per residence.[44] The proposed project thus may generate more waste than all of the other properties in the canyon combined, which further illustrates that the project is a high-density use with potentially significant impacts on water use and groundwater quality. As discussed above in section I.A.3, this concentrated waste would be dispersed through a septic system that is located within 200 feet of Cull Creek and above a shallow aquifer that is only 30-40 feet below the surface.[45] The DEIR fails to assess the potential risk to water quality and fails to support its conclusion that the impacts would be less than significant with substantial evidence.

D. The DEIR omits information necessary to evaluate risks related to liquefaction.

The DEIR's conclusion that the risk of liquefaction is minimal is not supported by substantial evidence. While the DEIR bases this conclusion on a geotechnical report that assessed site stability for the proposed buildings, including risk of seismic activity and liquefaction, the detailed data on which this conclusion was based is not included in the DEIR.[46] In particular, the report concludes that liquefaction risk is extremely low for the type of clay soils observed in the site investigation.[47] While the geotechnical report is attached to the DEIR as Appendix E, the report provides only a generalized profile of soil rock and groundwater conditions.[48] It states that detailed descriptions of information collected from soil trenches is provided in exploratory trench logs, which are said to be attached to the report as Appendix B or Appendix C to the Geotechnical Report.[49] However, only the cover page for this information is actually included.[50]

While additional tests were conducted to assess liquefaction risks at the proposed building site, the omission of detailed soil profile data is significant for two reasons: (1) because the generalized information provided in the report appears to conflict with the results of an independent soil analysis conducted for the proposed OWST report, and (2) the geotechnical report's conclusion that risk of liquefaction is extremely low for the proposed site conflicts with geological survey data that identifies the Canyon's bottomlands as relatively high risk for liquefaction.[51] While the Geotechnical report concluded that the soils in the building area were predominantly clay soils and relatively stable, the OWTS evaluation found loam soils as well as

---

[43] Alameda County Dept. of Env't Health, Alameda County Local Management Program for Onsite Waste Treatment Systems ("LAMP"), Table 2-4, at p. 27 (June 5, 2018).
[44] *Id.*, Table 2-5, at p. 28.
[45] DEIR Figure 3-4; DEIR Appendix E: Geotechnical Engineering Investigation Report, at 12-13.
[46] DEIR at 4.5 - 10.
[47] DEIR Appendix E, at 16-17.
[48] *Id.* at 11.
[49] *Id.*
[50] *Id.* at 48.
[51] Castro Valley General Plan at 10-25, citing California Division of Mines and Geology, Seismic Hazard Zones, Hayward Quadrangle (July 2003); *See also* California Department of Conservation, California Geological Survey, Earthquake Zones of Required Investigation (2016), https://maps.conservation.ca.gov/cgs/EQZApp/.

clay soils in the adjacent area where the septic system would be located.[52]

Without detailed information from the various trenches that were located at different site around the property, it is impossible to assess whether the generalized soil findings are representative of the whole site or whether those trenches located at lower elevations corroborate the Geological Survey findings, in which case structures near the creek, including the one lane bridge that constitutes the sole access to the proposed campground could be at risk for instability. Because impairment of the bridge would impede emergency vehicle access and evacuation routes, as well as normal ingress and egress, this is critical information. The possibility of unstable soils surrounding the proposed septic system could also be a factor on its proper functioning. The DEIR also fails to respond to comments by local residents concerning the potential risk of liquefaction or landslides occurring on the steep hillside above the cabins and causing trees or debris to slide into the cabins.[53] The DEIR fails to explain these discrepancies or to provide data that would enable decision-makers to assess whether there is a greater risk of liquefaction in the site's uplands or lowlands that could impact critical site infrastructure, including the sole access route and OWTS.

E. The DEIR fails to show that noise from the project would have a less than significant effect on the environment.

The DEIR fails to support its conclusion that the noise generated by the project and its construction would have a less than significant impact on the environment. Although the DEIR includes projections of the noise likely to be generated from construction and project activities, there are critical details omitted from both of these analyses.

The DEIR's estimates of construction noise were based on a Roadway Construction Noise Model and the Federal Highway Administration Construction Noise Handbook (August 2006) using CalEEMod default values for the mix of equipment.[54] Based on these sources, the noise level for heavy equipment, such as haul truck and dozers, was estimated to be 85 decibels (dBA) at 50 feet.[55] The model was then used to calculate how much this would diminish over the distance between the grading, paving and building sites and the nearest sensitive receptors, including a winery to the north and residences to the east and south.[56] These values were then compared to the Federal Transit Administration's standard of significance, which was identified as 80 dBA at the sensitive receptor property lines.[57] The DEIR states that it used federal standards because Alameda County does not have an established standard for construction noise, beyond restricting time of day.[58] However, the DEIR does not mention the Castro Valley General Plan's Noise Element, which notes that Association of Bay Area Governments identified any level above 70 dBA as a significant impact on residential land uses, and adopts this level as a

[52] DEIR Appendix G: Wastewater Basis of Design, at 22-24.
[53] Dick Schneider, Jewell Spaulding, and Glenn Kirby, Public Comment Re: Project Referral Case No. PLN2020-00093-Conditional Use Permit and Site Development Review, at 7 (July 16, 2020) (citing Castro Valley General Plan, Figure 10-4).
[54] DEIR at 4.10-10.
[55] DEIR at 4.10-11.
[56] *Id.*
[57] DEIR at 4.10-9; the modeling data for construction noise is attached to DEIR Appendix E at PDF p. 32-40.
[58] *Id.* at 4.10-7 and 4.10-9; Alameda Cty. Code § 6.60.070 (E).

threshold for determining whether mitigation is needed when siting noise sensitive uses.[59]

With respect to the anticipated noise to be generated by the proposed project, or stationary noise, the DEIR refers to an Environmental Noise Assessment that it includes as Appendix H.[60] This document provides data for the assessment of baseline noise levels from Cull Canyon Road, which were tested at two onsite locations on April 9-10, 2020.[61] The Noise Assessment explains that its predictions were generated using the "SoundPLAN noise prediction model" based on inputs for the anticipated "sound power levels for noise-generating outdoor activity areas, existing and proposed buildings, topography, terrain type, and locations of sensitive receptors.[62] However, none of the specific input values are identified or included with this document. The results provide sound projections for anticipated noise from two onsite locations, a "Sports Field Area" located along the east side of the cabins just south of the staff residence, and the Campfire Area located to the east of the driveway near the creek.[63] The assessment concludes that the projected noise levels will not exceed county standards for the nearest sensitive receptor, the residence located across the road to the east of the proposed project. Based on noise contour graphs generated by the models it appears that the noise level of the Sports Area was estimated to have a median value near 60 dBA and a maximum value near 80 dBA, while the noise level at the campfire area was estimated to have a median value near 55 dBA and a maximum value near 75 dBA.[64] The assessment concludes that the projected noise levels will not exceed county standards for the nearest sensitive receptor, the residence located across the road to the east of the proposed project.[65] Notably, although the County noise standards identify specific time limits for different noise levels that impact residential and commercial receptors, with acceptable time limits inversely proportional to the magnitude of the noise,[66] the report includes no information as to how long or how often the anticipated noise levels would be expected to occur.[67]

Here the DEIR is inadequate for multiple reasons. First, with respect to construction noise, there is no discussion of the Castro Valley General Plan's Noise Element and no explanation of why the 80 dBA federal standard was used as the threshold of significance rather than the local standard of 70 dBA. Notably, the modelling results show that construction noise from site preparation, grading, and construction would be likely to exceed 70 dBA at the residential receptors located to the north of the project.[68] This implies that there would be a similar impact on the adjacent commercial winery. Even in the absence of a specific county standard for construction noise, the impact on residential receptors and a neighboring business warrants some evaluation. There is also no indication that the modelling projections considered whether the location of the site at the base of a steep hill would cause noise to be reflected and amplified into the valley, or how the sound would echo throughout the canyon. Without this information, the evaluation of sound impacts on valley residents is incomplete and insufficient to

[59] Castro Valley General Plan (CVGP) at 11-3, 11-9.
[60] DEIR Appendix H: Environmental Noise Assessment (Saxelby Acoustics LLC, May 21, 2020).
[61] DEIR at 4.10-12; DEIR Appendix H: Environmental Noise Assessment at 8.
[62] DEIR Appendix H: Environmental Noise Assessment at 8.
[63] *Id.* at 9-12.
[64] *Id.*
[65] *Id.* at 13-14.
[66] Exterior Noise Standards, CVGP at 11-4; Alameda Cty. Code § 6.60.040.
[67] DEIR Appendix H: Environmental Noise Assessment.
[68] DEIR at 4.10-12, Table 4.10-6.

determine whether mitigation measures are warranted.

Second, with respect to anticipated project noise, the Noise Assessment provides no specific data on the inputs used to generate the projections. There is also no information concerning how often or how long the noise from activities would occur. The DEIR Project Description does not mention the Sports Area but suggests that the Campfire Area would be used in the evening when programs are in session and possibly also in the morning. The Noise Assessment provides no information from which to determine whether the length or frequency of noise was factored into the projections. It also provides no information concerning how the noise levels for these activities were determined, stating only that it made the assumption that noise from the sports field "shall not exceed 61 dBA L50 and 80 dBA Lmax at a distance of 50 feet to the east of the sports field boundary," and noise from the campfire area "shall not exceed 58 dBA L50 and 77 dBA Lmax at a distance of 50 feet to the east of the campfire area as measured from the rear of the campfire area stage."[69] The sufficiency of these assumptions is never examined. Notably, research on actual noise generated by crowds of 10-100 people has found that the noise generated by a group of one hundred people can exceed 100 dBA, and maximum levels can exceed 110 dBA.[70] This study is included as Attachment C. While crowd noise can vary based on factors including vocal effort (i.e., whether the people are talking or shouting), direction, age, and synchronization, even random crowd noise without music or amplification was found to exceed 100dBA.[71] Accordingly, it's quite possible that coordinated activities during the evening will lead to noise levels significantly greater than those levels assumed by the DEIR. In the absence of any clear analysis explaining how the DEIR's assumptions were selected, this is impossible to determine.

In addition, the DEIR's Noise Assessment fails to correlate its predicted noise levels to the time limits set forth in the County Standards. The document projects that noise from the sports field would range from 40.4 dBA to 61.4 dBA at the site of residential receptors, and that noise from the campfire area would range from 42.8 dBA to 61.8 dBA at the site of residential receptors.[72] The County Standards limit maximum continuous daytime noise at 50 dBA for 30 minutes, 55 dBA for 15 minutes, 60 dBA for 5 minutes, 65 dBA for 1 minute and 70 dBA for 0 minutes.[73] Even if supporting evidence were to show that the Assessment's assumptions were reasonable, there is no information from which to determine whether these time limits would be exceeded. There is also no information as to whether the calculations considered the size of the crowds or whether the activities would include synchronized chants or songs, or amplification. Therefore, the DEIR's analysis of the proposed project's noise impacts is inadequate because it fails to consider the Castro Valley General Plan or the potential effect of terrain on amplification, fails to address time limits in applicable County's external noise standards, and fails to disclose key assumptions and inputs on which the noise projections were based.

[69] DEIR Appendix H: Environmental Noise Assessment at 13.
[70] **Attachment C**: M.J. Hayne, J.C. Taylor, et al., *Prediction of Noise from Small to Medium Sized Crowds*, 5-6. Paper No. 133, Proceedings of Acoustics 2011 (Nov. 2-4, 2011).
[71] *Id.*
[72] DEIR Appendix H: Environmental Noise Assessment at 13.
[73] Exterior Noise Standards, CVGP at 11-4; Alameda Cty. Code § 6.60.040.

F. The DEIR is inadequate because it fails to identify significant impacts to agriculture.

The DEIR concludes that the proposed project for a residential school would have no significant impacts on agricultural uses.[74] This conclusion is contrary to substantial evidence.

The applicable county zoning designation for the entirety of Cull Canyon is Agricultural. This designation is intended to preserve and protect existing agricultural uses and allows other "nonurban" uses "where more intensive development is not desirable or necessary."[75] The permitted land uses in such zones are uniformly low density. Residential buildings are limited to one single-family dwelling, and up to one secondary dwelling allowed for parcels exceeding 25 acres.[76] Any secondary dwelling must also be within the same building envelop as the primary unit and may not to exceed 2000 square feet for parcels under 100 acres.[77] These requirements underscore the clear intent to restrict any new housing unless it is extremely low density. While limited exceptions exist for higher density housing for agricultural workers,[78] this exception is clearly tied to an agricultural purpose and would not apply to the proposed project.

Here the proposed project would add 16,967 square feet of additional housing and support facilities to a 37-acre site that already has one residential building, for use as a residential school facility.[79] Adding a few goats and chickens does not make this an agricultural use. The proposed new construction is also not located within the existing residential building envelope but would be located across the creek on a hillside that would require extensive grading and vegetation removal that would disrupt the existing landscape.[80] This would provide residential accommodations for 119 people and thus constitutes a high-density use. The DEIR fails to seriously acknowledge these restrictions or the larger purpose behind these zoning restrictions -- to protect agricultural areas from encroachment by high-density urban development. It also fails to assess how the project's reliance on groundwater could potentially stress existing water supplies for the true agricultural uses that already exist in the surrounding Canyonlands.

The DEIR also fails to address the proposed project's inconsistency with Measure D, which established an Urban Growth Boundary (UGB) to prevent urban development "in most of the rural areas of the county, including the canyonlands surrounding Castro Valley."[81] Under Measure D, the proposed site is classified as Resource Management area.[82] The Resource Management designation requires a minimum parcel size of 100 acres, with only one single family home per parcel.[83] The proposed fails to meet this parcel-size requirement and already had to seek a variance to allow the one existing residence.[84] In addition, permitted uses within Resource Management areas are restricted to "agricultural uses, recreational uses, habitat

---

[74] DEIR at 4.1-3 to 4.1-6. *See also* Great Nonprofits, "The Mosaic Project" profile (explaining that project is an outdoor school), https://greatnonprofits.org/org/the-mosaic-project (last visited Nov. 21, 2022).
[75] Alameda Cty. Code § 17.060.010.
[76] *Id.* at § 17.060.030 (A), (H).
[77] *Id.* at § 17.060.030 (H).
[78] *Id.* at § 17.060.030 (K).
[79] DEIR at 3-21;
[80] DEIR Appendix E: Geotechnical Engineering Investigation Report, at 19-32.
[81] Castro Valley General Plan at 1-2.
[82] *Id.* at Figure 1-2.
[83] Castro Valley General Plan Appendix A at A-1.
[84] DEIR at 3-3.

protection, watershed management, public and quasi-public uses, areas typically unsuitable for human occupation due to public health and safety hazards such as earthquake faults, floodways, unstable soils, or areas containing wildlife habitat and other environmentally sensitive features, secondary residential units, active sand and gravel and other quarries, reclaimed quarry lakes, and similar and compatible uses."[85] The physical features of the Canyonlands and Cull Canyon in particular, make the area susceptible to risks that are unsuitable for high-density development. While outdoor recreation, such as hiking or fishing, would be in no conflict, building a residential school campus for 119 people would be a direct violation of the Measure D prohibition on high-density residential development outside of the UGB.

The DEIR also concludes incomprehensibly that there would be no conflict with Williamson Act. The Williamson Act was enacted by the California Assembly in 1965 to protect farmland by creating tax incentives for restricting non-agricultural development.[86] Here, the proposed property is subject to a Williamson Act Contract that was entered into in 2016.[87] While the DEIR attempts to claim that the proposed use is consistent with the preservation of farmland because it plans to include a few goats and chickens and outdoor activities, the project would not only conflict with agricultural building restrictions but would destroy the natural character of the building site by removing existing soil and vegetation to make way for an intensive use that would also potentially threaten surrounding agricultural lands as a result of increased water extraction and fire risk. There is no question that the intended construction of housing and dormitories with event spaces for 120 people and a new road and parking areas would exceed the applicable restrictions. Because the DEIR fails to identify these substantial conflicts and inconsistencies between the proposed use and measures intended to protect the agricultural character of the area, it is inadequate as an informational document.

G. The DEIR is inadequate because it fails to identify significant inconsistencies with existing land use and zoning requirements.

The DEIR also concludes that the proposed project for a residential outdoor school would have no significant impacts on existing land use restrictions.[88] This conclusion is contrary to substantial evidence.

As noted above, the DEIR fails to identify direct conflicts between the proposed use as a residential school facility and the site's existing planning and zoning designations. The proposed project is inconsistent with zoning requirements and other provisions contained in Alameda County General Plan, the Castro Valley General, and the East County Area Plan. These conflicts are discussed in greater detail below in sections II.B and III. Because the DEIR fails to identify or address these conflicts it is inadequate.

By reason of these many deficiencies, the DEIR fails as an informational document.

---

[85] Castro Valley General Plan Appendix A at A-1.
[86] Cal. Dept. of Conservation, Williamson Act Overview, https://www.conservation.ca.gov/dlrp/wa/Pages/wa_overview.aspx.
[87] DEIR at 4.1-3 (referencing Williamson Act Contract No. 2015-56); DEIR at 4.9-3 (referencing Williamson Act contract No. 2016-56 (May 3, 2016)).
[88] DEIR at 4.9-4, 4.9-5. See also Great Nonprofits, "The Mosaic Project" profile (explaining that project is an outdoor school), https://greatnonprofits.org/org/the-mosaic-project (last visited Nov. 21, 2022).

II. The DEIR fails to adequately describe the environmental setting.

Under CEQA Guidelines section 15125(a), an EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective.[89] An EIR's description of this environmental setting should be sufficiently comprehensive to allow the project's significant impacts "to be considered in the full environmental context."[90] This should also highlight "environmental resources that are rare or unique to that region and would be affected by the project."[91] The environmental setting should also address "any inconsistencies between the proposed project and applicable general plans, specific plans and regional plans."[92]

Here, the DEIR's description of the environmental setting fails to describe significant features of the regional setting that have a bearing on the project's potentially significant impacts. The DEIR also fails to identify several inconsistencies between the proposed project and local planning documents. The DEIR's discussion of environmental setting is also distributed across the project description and each subsection of the environmental analysis, resulting in a segmented description that limits consideration of some features to specific potential impacts. This structure ultimately supports a false narrative that the proposed use would not have significant impacts on Cull Canyon residents and would be fully compatible with the low-density agricultural character of the valley, which is not the case. This also obscures the importance of examining alternative sites.

A. Physical limitations of the proposed site make it inappropriate for the proposed project and other uses that would be facilitated by its approval.

The project description fails to address several important physical features of the site and the surrounding area that are necessary to understand the proposed project's potentially significant impacts on the surrounding community.

1. Lack of secondary access roads and steep terrain increases high fire hazard risk to all residents.

There is no question that the proposed site is located on a terminal access road in a box canyon or that the entire area is designated as High Risk State Response Area. While these facts are clear from site maps, the DEIR never examines the existing fire risk or adequacy of evacuation routes within the canyon surrounding the proposed site. This is a critical aspect of the setting that needs to inform the baseline for determining whether the addition of a high-density residential camp for children would significantly increase the fire risk to area residents or impact the sufficiency of evacuation routes and other fire response resources.

The DEIR also fails to consider whether the steep terrain would increase fire risk or whether a high concentration 10-12 year-olds would place the community at greater risk of human caused fires. The DEIR also fails to identify any proximate safe zones for children in the

[89] 14 Cal. Code Regs. § 15125(a).
[90] 14 Cal. Code Regs. § 15125(c).
[91] *Id.*
[92] 14 Cal. Code Regs. § 15125(d).

event of a fast-moving fire sweeping through the area with little notice.

2. Limited water sources and a confined aquifer has already caused water shortages in this area.

The environmental setting fails to consider the geology of the Cull Creek Canyon as it relates to other water users. There is no discussion of the number of wells that exist or whether these tap the same aquifer as those the project proposes to use. There is also no discussion of the number of residents that rely on these wells or the number of agricultural operations that rely on these wells. While the document acknowledges that the area is zoned for Agricultural use and designated as a Resource Management area subject to Measure D restrictions, this is never discussed as an important feature of the proposed location and surrounding community. Water use is fundamental to the preservation of agriculture, as well as the domestic use by existing residents, and therefore needs to inform the baseline for determining the potential impact of the proposed project on the surrounding community.

3. Cull Creek is subject to flash floods that pose increase health and safety risks to children.

The DEIR's analysis of potential flood risk is cursory and fails to address public comments submitted on the NOP, that indicate Cull Creek has a propensity for seasonal flooding. Comments by area residents expressed concerns that the steep rocky canyon is subject to flash flood events that could inundate parts of the proposed site seasonally.[93] The DEIR fails to acknowledge these concerns or to provide any information on seasonal water levels and flood events in Cull Creek Canyon. This is important information for evaluating health and safety risks, as well as potential impacts on water quality and proposed parking sites adjacent to the creek, potential impacts to the sole access bridge, and potential implications for emergency services.

4. Risk of liquefaction from seismic activity

The DEIR also fails to address potential seismic activity as a feature of the canyon. While the document provides some analysis of the immediate area surrounding the proposed building site, there is no considered discussion of the area's potential seismic risks or whether this could impact the limited access road or septic system stability. According to the Castro Valley General Plan: "The areas susceptible to liquefaction in Castro Valley are, for the most part, low-lying lands along the creeks that flow into San Lorenzo Creek. These include lands within areas that are also in the FEMA-mapped flood plains along Chabot, Castro Valley, Cull, and Crow Creeks and in Eden and Hollis Canyon in the eastern part of the planning area."[94] The nature and extent of this risk merits broader consideration.

[93] Diana Hanna & Dick Schneider, Public Comment Re: [NOP] The Outdoor Project Camp, PLN2020-00093, at 5 (Dec 19, 2021).
[94] CVGP at 10-25, citing California Division of Mines and Geology, Seismic Hazard Zones, Hayward Quadrangle (July 2003).

B. The DEIR fails to adequately describe the rural character and existing land uses in Cull Canyon.

The DEIR fails to adequately address the agricultural character of the environmental setting, which includes legal protections enacted to preserve this character. The DEIR is very dismissive of the community's interests in maintaining this character by limiting the density of new developments. The DEIR asserts that the proposed use is consistent with this because it includes plans for a few goats and chickens and a garden, and because "outdoor recreation" is a potential use that could be allowed under conditional use permit for such areas. The DEIR glosses over the fact that the proposed building footprint exceeds allowable limits, and the proposed "outdoor recreation" activities involve construction of housing for up to 119 people. The proposed use as a high-density residential outdoor school conflicts with the agricultural character of the surrounding community. While the DEIR acknowledges some surrounding land uses and access issues, the analysis of significant effects is mostly limited to immediately adjacent properties. The potential for the project to conflict with the agricultural character of the canyon or to impact this by substantially increasing water use, fire risk, traffic, and noise, is an important aspect of the analysis that needs to begin with adequate consideration of how this informs the environmental setting.

1. Alameda County's agricultural zoning designation for the proposed location is inconsistent with the proposed use.

The DEIR fails to develop a considered discussion of the existing zoning requirements that are intended to protect agricultural uses by prohibiting high density developments in these areas. The applicable county zoning designation for the entirety of Cull Creek Canyon is Agricultural. This designation is intended to preserve and protect existing agricultural uses and allows other "nonurban" uses "where more intensive development is not desirable or necessary."[95] The permitted land uses in such zones are uniformly low density. Residential buildings are limited to one single-family dwelling, and up to one secondary dwelling allowed for parcels exceeding 25 acres.[96] Any secondary dwelling must also be within the same building envelop as the primary unit and may not to exceed 2000 square feet for parcels under 100 acres.[97] These requirements underscore the clear intent to restrict any new housing unless it is extremely low density. While limited exceptions exist for higher density housing for agricultural workers, this exception is clearly tied to an agricultural purpose and would not apply to the proposed project.

Here the proposed project is on a 37-acre site that already has one residential building and 16, 967 square feet of additional housing and support facilities to accommodate residential camping by as many as 119 people when camp is in session. The proposed new construction is also not located within the existing residential building envelope, but would be located across the creek on a hillside that would require extensive grading and vegetation removal that would disrupt the existing landscape. The DEIR fails to seriously acknowledge these restrictions or the larger purpose behind these zoning restrictions -- to protect agricultural areas from encroachment

[95] Alameda Cty. Code § 17.060.010.
[96] *Id.* at § 17.060.030 (A), (H).
[97] *Id.* at § 17.060.030 (H).

by high-density urban development.

2. The Castro Valley General Plan incorporates Measure D to protect agricultural areas from high density developments.

The DEIR also fails to discuss how the setting is informed by deliberate policies and zoning restrictions enacted in the Castro Valley General Plan ("CVGP"). The CVGP was amended in 2000 when County voters enacted Measure D, which established an Urban Growth Boundary (UGB) to prevent urban development "in most of the rural areas of the county, including the canyonlands surrounding Castro Valley."[98] Cull Canyon, including the proposed site is located outside of the UGB on lands that were intended to be protected by passage of Measure D. As a direct decision of the voters, this must not be lightly waived.

Under Measure D, the proposed site is classified as Resource Management area.[99] While the DEIR notes that the site is not designated a high value farming land, this does not mean that high density residential development should be allowed there. The Resource Management designation requires a minimum parcel size of 100 acres, with one single family home per parcel – so long as all other County standards are met for adequate road access, sewer and water facilities, building envelope location, visual protection, and public services."[100] Residential development and accessory buildings must also be limited to maximum floor space of 12,000 square feet and "shall be located on a contiguous development envelope not to exceed 2 acres."[101] Permitted uses are restricted to "agricultural uses, recreational uses, habitat protection, watershed management, public and quasi-public uses, areas typically unsuitable for human occupation due to public health and safety hazards such as earthquake faults, floodways, unstable soils, or areas containing wildlife habitat and other environmentally sensitive features, secondary residential units, active sand and gravel and other quarries, reclaimed quarry lakes, and similar and compatible uses."[102]

By failing to explain that Measure D is an important feature of the environmental setting, the DEIR effectively trivializes the fact that the proposed site is located in an area that has been protected by voters. The physical features of the Canyonlands and Cull Canyon in particular, make the area susceptible to risks that are unsuitable for high-density development. While outdoor recreation, such as hiking or fishing, would be in no conflict, building a residential campus for 119 people would be a direct violation of the Measure D development restrictions. Measure D makes clear that high-density development outside of the UGB is not to be allowed, except perhaps under exceptional circumstances where this is found to be necessary for the public interest.

III. The Proposed Project is Inconsistent with Applicable Planning Documents and would violate the State Planning and Zoning Law if Approved.

Pursuant to Government Code section 65860, all zoning and land use approvals are required to be consistent with an adopted general plan. Here the proposed site is subject to

[98] Castro Valley General Plan at 1-2.
[99] *Id.*, Figure 1-2.
[100] Castro Valley General Plan, Appendix A at A-1.
[101] *Id.* at A-2.
[102] *Id.*

provisions of the Alameda County General Plan, the Castro Valley General Plan, and the East County Area Plan. As discussed above in section II.B.1 and II.B.2, the proposed project is inconsistent with several zoning requirements contained in these plans. The project would also conflict with several other mandatory policies articulated in these plans.

Notably, the Castro Valley General plan incorporates Measure D, which means that any approval of a project that is inconsistent with Measure D could expose the County to risk of litigation. The Castro Valley General plan also designates Cull Canyon as an area where special planning efforts are needed to address unique features, including biological resources and steep terrain. The plan states that "development in this area should be limited to protect these sensitive areas."[103]

The proposed project is inconsistent with General plan policies concerning fire safety. The Alameda County General Plan provides that "[t]he County shall limit residential development to very low densities in high fire hazard zones identified in Figure 5.," which clearly includes Cull Creek Canyon and the proposed site.[104] The East County Area Plan states similarly that '[t]he County shall limit residential development to very low densities in high fire hazard zones as identified by the Fire Hazard Severity Scale."[105] Because the prosed project is not low-density it conflicts with these general plans.

The proposed project is also inconsistent with the following Castro Valley General Plan policies, enumerated below:

Policy 7.1-1 Major Wildlife Corridors Protection. "Protect the major wildlife corridors that run through or are adjacent to Castro Valley: (2) along creeks."[106] The proposed project would locate a high-density activity with significant noise impacts and livestock in the middle of an important riparian wildlife corridor.

Policy 7.1-5 Riparian Habitat. "New development shall not disturb any riparian habitat."[107] Here the proposed project would potentially allow new construction to extend into the riparian zone. Scraping and grading of native soils could also encroach into riparian habitat.

Policy 9.2-5 Reduce Fire Risk. "Plan new public and private buildings to minimize the risk of fires and identify measures to reduce fire hazards to persons and property in all existing development."[108] Here the best way to reduce fire risk is to comply with existing zoning restrictions and by refraining from siting high density uses and vulnerable populations within a high risk fire zone.

Policy 9.2-4 Defensible Space. "Incorporate defensible space principles for fire protection in new development."[109] The DEIR would place a residential camp next to a steep wooded area. Incorporation of defensible space requires additional consideration and might

[103] Castro Valley General Plan at 3-12 (March 2012).
[104] Alameda Cty. Gen. Plan, Safety Element, Policy No. 8 and Figure 5 (map, p. 25) .
[105] East County Area Plane ("ECAP"), Policy 318, p. 76. (May 2002)
[106] Castro Valley General Plan at 7-11.
[107] *Id.*
[108] Castro Valley General Plan at 9-12.
[109] *Id.*

require substantial tree removal, increasing the project footprint and causing significant disturbance of the site's values as a Resource Management area.

Policy 10.2-1 Groundwater. "Reduce the use of groundwater and facilitate additional recharge opportunities."[110] Here, the proposed project does the opposite by introducing a substantial new use of groundwater that could significantly impact other area water users.

Accordingly, the DEIR is inadequate because it fails to examine several inconsistencies between the proposed project and applicable general plans.

IV. The proposed project would violate the Williamson Act.

The Williamson Act was enacted by the California Assembly in 1965 to protect farmland by creating tax incentives for restricting non-agricultural development.[111] The program utilizes contracts between landowners and local governments, to restrict development in exchange for a reduction in property taxes.[112] "Private land within locally-designated agricultural preserve areas is eligible for enrollment under contract. The minimum term for contracts is ten years. However, since the contract term automatically renews on each anniversary date of the contract, the actual term is essentially indefinite."[113] Exiting contracts is more complicated.

Exiting contracts can be initiated at the option of the landowner or the local government by issuing a Notice of Nonrenewal.[114] This starts a nine-year process or count-down to the expiration of the contract, or nineteen-year countdown in the case of Farmland Security Zone contracts[115] Each year the taxes increase until they are fully reinstated at the end of the nonrenewal period.[116] The land remains subject to all the requirements of the contract until it expires.[117] "Under a set of specifically defined circumstances, a contract may be cancelled without completing the process of term nonrenewal. Contract cancellation, however, involves a comprehensive review and approval process, and the payment of a fee by the landowner equal to 12.5 percent of the full market value of the property in question."[118]

Failure to comply with Williamson Act contracts can constitute a material breach. "Government Code section 51250(b) defines a material breach on land subject to a Williamson Act contract as a commercial, industrial or residential building(s), exceeding 2,500 square feet that is not permissible under the Williamson Act, contract, local uniform rules or ordinances, and which was permitted or built after January 1, 2004. If the city or county determine a material breach exists, one option for correcting the breach is termination of the portion of the contract that is not in compliance, and a monetary penalty of 25% of the unrestricted fair market value of

[110] Castro Valley General Plan at 10-16.
[111] Cal. Dept. of Conservation, Williamson Act Overview, https://www.conservation.ca.gov/dlrp/wa/Pages/wa_overview.aspx.
[112] *Id.*
[113] *Id.*
[114] Cal. Dept. of Conservation, Williamson Act Contract Removal, https://www.conservation.ca.gov/dlrp/wa/Pages/removing_contracts.aspx.
[115] *Id.*
[116] *Id.*
[117] *Id.*; Cal. Gov't Code § 51245.
[118] Cal. Dept. of Conservation, Williamson Act Overview, https://www.conservation.ca.gov/dlrp/wa/Pages/wa_overview.aspx.

the affected portion of the land."[119]

Here, the proposed property is under a Williamson Act Contract that was entered into in 2016.[120] This means that the initial ten-year contract period is still accruing and nonrenewal is not yet an option. Moreover, even if nonrenewal was initiated, the contract would still remain in effect for at least nine years. While the DEIR attempts to claim that the proposed use is consistent with the preservation of farmland because it plans to include a few goats and chickens and outdoor activities, on this rationalization an urban apartment complex would be permissible on such lands as long as it included a few goats and chickens and a walking trail. The proposed project is a residential outdoor school, the construction of which would not only exceed the residential limit, it would destroy the natural character of the building site by removing existing soil and vegetation to make way for an intensive use that would potentially threaten surrounding agricultural lands as a result of increased water extraction and fire risk. There is no question that the intended construction of housing and dormitories with event spaces for 120 people and a new road and parking areas would exceed the applicable restrictions.

The DEIR's conclusion that there is no conflict with the Williamson Act contract appears to be a case of wishful thinking. This is not a low-density use and would not be consistent with the intent and purpose of protecting agricultural lands. The DEIR completely fails to address the fact that approval of the project would expose the County to a breach of contract claim.

V. The DEIR fails to consider a reasonable range of alternatives.

Under CEQA Guideline section 15126.6(f)(2)(A), the "key question and first step in analysis is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR."[121] If the lead agency concludes that no feasible alternative locations exist, "it must disclose the reasons for this conclusion, and should include the reasons in the EIR."[122]

"The process of selecting the alternatives to be included in the EIR begins with the establishment of project objectives by the lead agency. A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings."[123] Project objectives may not be so narrowly defined that no other alternatives can be considered.[124]

Here, the DEIR considered no alternative locations for the project.[125] The only rationale offered for this decision states simply that "[a]n alternative location for the proposed project was considered infeasible due to availability of sites that would support the project's objectives."[126]

---

[119] Cal. Dept. of Conservation, Williamson Act Contract Removal, https://www.conservation.ca.gov/dlrp/wa/Pages/removing_contracts.aspx; Cal. Gov't Code § 51250(b).
[120] DEIR at 4.9-3 (referencing Williamson Act contract No. 2016-56 (May 3, 2016)).
[121] 14 Cal. Code Regs. § 15126.6(f)(2)(A).
[122] 14 Cal. Code Regs. § 15126.6(f)(2)(B).
[123] *In re Bay-Delta*, 43 Cal.4th 1143, 1163 (2008) (internal citations omitted).
[124] *We Advocate Thorough Envtl. Review v. Cty. of Siskiyou*, 78 Cal. App. 5th 683, 692-93 (2022).
[125] DEIR at 5-3.
[126] *Id.* at 5-4.

There is no indication that the lead agency or project proponents made any actual effort to identify alternative locations but then found these to be infeasible. Rather, the report makes general observations about *potential issues* with other locations but then ultimately explains that the proponents made no serious effort to examine alternatives because they thought the preferred site would meet their objectives.[127] The only reason offered is the proponent's view that "the current proposed project site achieves the project objectives of supporting small agricultural uses and providing recreational trails in a way that would not conflict with allowed land use or surrounding uses."[128] But this only explains why no serious effort was made to identify alternatives – not why alternative sites were infeasible.

The failure to examine alternative sites also appears to ignore or downplay several actual conflicts between the proposed project and the proponents desired location, such as inconsistency with Measure D, the Williamson Act, and agricultural zoning restrictions. The DEIR appears to downplay and dismiss these conflicts in order to justify the desired location, effectively stacking the deck against other possible locations by leaving them out of the running. The County's failure to consider any other site is prejudicial because "it dismissively rejected anything other than the proposed project . . . [thereby] prejudicially prevent[ing] informed decision-making and public participation.[129]

In addition, some of the project objectives appear to be tailored to the current site rather than the project's primary educational purposes, e.g., selling produce, converting roads to trails,[130] replacing utilities, installing a greywater system.[131] To the extent that secondary or non-essential objectives could serve to restrict consideration of otherwise reasonable alternative locations, the project objectives should be reconsidered and revised as needed to eliminate any prejudicial effect and "help the lead agency develop a reasonable range of alternatives."[132]

The DEIR's remaining evaluation of alternatives considered two options: the Reduced Development Alternative, which consists of building a somewhat smaller project on the same site, and the No Project Alternative.[133] After a brief comparison to the proposed project, based on its previous impact analysis the report concludes that both alternatives are "environmentally superior" to the proposed project.[134] The report also concludes that the Reduced Development Alternative, which would reduce the size of the project's educational programs from 100 to 50, would still meet all of the projects objectives.[135] However, while this alternative would require fewer cabins and result in less intensive impacts, it would not resolve conflicts between the proposed use and the site's zoning designations or the Williamson Act. Placing a somewhat smaller camp on the same site would also still raise serious health and safety concerns due to limited access, high fire risk, questionable water supply, and other factors. This alternative thus

---

[127] *Id.*
[128] *Id.*
[129] *We Advocate Thorough Envtl. Review v. Cty. of Siskiyou*, 78 Cal. App. 5th 683, 693 (2022).
[130] Whether the proposed site actually has roads that could be converted to trails is also questionable due to the steep terrain.
[131] DEIR at 3-6, 3-7 and 5-12, 5-13.
[132] *In re Bay-Delta*, 43 Cal.4th 1143, 1163 (2008).
[133] DEIR at 5-3.
[134] DEIR at 5-13; 14 Cal. Code Regs. § 15126.6.
[135] DEIR at 5-13

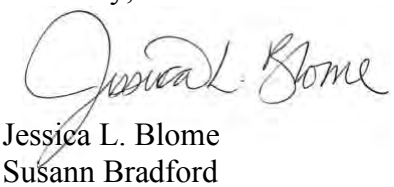
does not offset the prejudicial effect of failing to examine any other possible location.

Accordingly, the DEIR is inadequate because it fails to consider any other locations for the proposed project, thereby preventing informed decision-making and frustrating the purpose of CEQA. The DEIR should be revised to include one or more reasonable alternative locations that would meet the project's primary objectives and recirculated for additional public comment.

CONCLUSION

For the foregoing reasons, the DEIR is inadequate.

Sincerely,



Jessica L. Blome
Susann Bradford
Greenfire Law, PC

ATTACHMENT A

MEMORANDUM

Date: November 17, 2022

To: Jessica L. Blome, Greenfire Law, LLC

From: Andy Zdon, P.G., C.E.G., C.Hg.

Subject: **Water-supply Comments**
Mosaic Project DEIR
Cull Canyon Road, Alameda County, California

Roux Associates, Inc. (Roux) is pleased to provide the following information regarding our review of groundwater conditions/water-supply for the proposed Mosaic Project (Mosaic) as described in the Mosaic Project Draft Environmental Impact Report (DEIR, County of Alameda, 2022). The DEIR summarizes the wells present on site, those being five groundwater wells of which two will be used for project water-supply purposes. The remaining three wells would be abandoned per California well regulations. The wells are reportedly completed in the Miocene-aged Monterey Formation and therefore rely on fractures in the bedrock for groundwater flow. Fractured-rock aquifers are generally of low porosity, and groundwater levels may fluctuate widely based on seasonal and annual precipitation conditions and groundwater use in the catchment watershed.

Based on the above detailed information relating to well construction, aquifer parameters, and overall watershed hydrology including estimates of precipitation/recharge and existing water usage in the watershed are important for evaluating a sustainable water-supply for a given project. The DEIR on Page 4.14-5 notes that *"Balance Hydrologics was retained to conduct groundwater exploration and identify potential water supply sources for the project. Two wells were identified as potential production sources. Both wells are screened in consolidated sedimentary bedrock and were constructed in accordance with the requirements of Title 22 of the California Code of Regulations (CCR). A description of the wells is provided in Table 4.14-1, Production Well Description."* The text continues to describe the results of aquifer testing of those wells and makes statements at various locations in the DEIR that well interference was not identified.

At this time, Roux cannot evaluate the analysis and assertions related to water-supply as a report by Balance Hydrologics describing their work, conclusions and recommendations does not appear in the DEIR or its appendixes. Methodologies used for aquifer testing including location of well discharge relative to monitored wells, groundwater-level hydrographs of monitoring wells used during aquifer testing, and other information to evaluate the completeness and accuracy of the water-supply analysis are not provided. Additionally, it is unclear if an evaluation of the existing watershed groundwater usage and the incremental changes in groundwater budget for the watershed has been prepared.

Beyond the review of specific water-supply/hydrogeology aspects related to the DEIR, we are unable to comment on the potential water-supply available for fire-flows to be supplied by the wells if required by Alameda County and if sufficient flow would be available to meet those requirements either for instantaneous fire flows or to support any on-site storage that may be required. Additionally, absent the Balance Hydrologics report, we cannot comment if we believe additional groundwater wells may be required in the future and the implications of those needs relative to the 2022 Drought Executive Order N-7-22 issued by the State of California, and its implications relating to the drilling of new water-supply wells. Although the site is outside of the area of a Groundwater Sustainability Agency, it is Roux's experience that counties are adhering to the 2022 Drought Executive Order for permitting or denying permits for new groundwater-supply wells.

555 12th Street, Suite 250 ■ Oakland, California 94607 ■ +1.415.967.6000 ■ www.rouxinc.com
California ■ Illinois ■ Massachusetts ■ New Jersey ■ New York ■ Texas ■ Virginia

Based on the above, we, or any other consultant, are unable to provide further substantive review relative to water-supply and the proposed Mosaic Project based on the information provided in the DEIR. We appreciate the opportunity to comment on the DEIR. Should you need further assistance, please contact me at (925) 640-7807, or by email azdon@rouxinc.com.

ROUX

PROFESSIONAL PROFILE

Andrew Zdon, P.G., C.Hg., CEG

Technical Director

TECHNICAL SPECIALTIES

Providing services for governmental agencies (federal, state, and local), non-profit and for-profit corporations, and private individuals. Providing services ranging from water resource/supply investigations, impact analyses related to NEPA and CEQA analyses, groundwater modeling, water sourcing investigations, water supply management plans, mine hydrology investigations, minerals remoteness assessments, restoration project management, and environmental investigations.

EXPERIENCE SUMMARY

Mr. Zdon has more than 30 years of experience in a variety of geology and hydrogeology-related projects. He is a California Professional Geologist, Certified Hydrogeologist and Certified Engineering Geologist. Mr. Zdon is a recognized subject matter expert in numerical groundwater flow modeling and has been an instructor at California State University, Los Angeles in Groundwater Models and Management (1995).

Mr. Zdon was also appointed in 2013 by the Inyo County Superior Court as Watermaster for a surface water system in the Owens Valley. His specialties include basin analyses and relationships with spring systems, numerical groundwater modeling including, flow, groundwater/surface water interactions including spring flow, contaminant transport and dual-phase flow in both basin fill and fractured rock environments. Investigations in these areas can be in support of CEQA/NEPA analyses, water resource development evaluations, or providing third party review, supervision of UST identification, abandonment and removal.

He has served as an expert witness on many cases and has provided both depositions and court testimony. Mr. Zdon was appointed to serve on the first Technical Advisory Committee for the newly combined California Board for Engineers, Land Surveyors and Geologists. He also received Certificates of Commendation and Appreciation for his volunteer service as a Subject Matter Expert for the former California Board for Geologists and Geophysicists.

CREDENTIALS

State of California, Professional Geologist (No. 6006)

State of California, Certified Engineering Geologist (No. 1974)

State of California, Certified Hydrogeologist (No. 348)

State of Arizona, Registered Geologist (No. 33686)

State of Utah, Professional Geologist (No. 11907683-2250)

B.S., Geology, Northern Arizona University, Flagstaff, Arizona, 1984

Assessment, Use and Management of Groundwater in Areas of Limited Supply, 2006, Groundwater Resources Association of California

Introduction to ArcGIS9 and Environmental Applications of GIS, 2005, Northwest Environmental Training

Application of Risk Assessment for Environmental Decision Making at Contaminant Release Sites, 2005, University of California, Riverside – University Extension

Conceptual Site Models and the Data Necessary to Make Technical Decisions Regarding Cleanup and Site Closure, University of California, Riverside – University Extension

Model Calibration and Uncertainty Analysis Using PEST, 2003, Groundwater Resources Association of California

KEY PROJECTS

Environmental Forensics related to Desert Riparian Habitats. Principal investigator on forensic evaluations of spring water sources for multiple locations in Mono, Inyo, San Bernardino and Kern Counties, California. Methodologies used in these analyses have included stable isotope analysis of waters, water age-dating (using tritium and carbon-dating methods), noble gas analysis, general chemistry, and remote sensing techniques inclusive of Landsat imagery time-series analysis associated with Normalized Difference Vegetation Index (NDVI) signals, and changes in NDVI over time. The results of these studies have been published in the peer-reviewed journals Hydrology, Environmental Forensics and the International Journal of Water Resources and Environmental Management.

Spring Survey, Mojave and Sonoran Deserts, San Bernardino, Los Angeles, Kern and Inyo Counties, California. Principal investigator for Mojave Desert-wide spring survey for the Barstow, Needles and Ridgecrest U.S. Bureau of Land Management Districts. Also included lands owned by project partner land trusts. Work consisted of records search (inclusive of technical data, water rights information, BLM records search, and cultural historic information), field inspection of more than 300 springs, and preparation of a comprehensive report and catalog of springs that serves as the most comprehensive and temporally consistent investigation of springs ever to occur in the region. Field data included refining location information, field water quality parameters and flow, collection and analysis of water samples for stable isotope analysis, identification of vegetation present including invasive species, identification of wildlife use including use by non-native animals, types of spring disturbance, and general geological observations. Subsequent work has included extensive isotopic characterizations including stable isotope, tritium and radiocarbon analyses to evaluate regional aquifer connections with springs and working cooperatively with biologists conducting vegetation mapping and environmental DNA analyses on selected springs. This project was reported on in several publications including USA Today.

Technical Expert, Pine Valley and Wah Wah Valley Groundwater Basins, Utah. Serving as technical expert to the Beaver County Board of Commissioners regarding proposed groundwater export project by the Central Iron County Water District. The project proposes to export groundwater from proposed wells on public lands managed by the U.S. Bureau of Land Management to

555 12th Street, Suite 250 | Oakland, CA 94607
Main: (415) 967-6000 | Direct: (415) 967-6039
E-mail: azdon@rouxinc.com | Website: www.rouxinc.com

alleviate overdraft and related subsidence issues in the Cedar City area. Work involves evaluating the effects of proposed groundwater production on springs and other resources in Beaver County, and to prepare comments to upcoming environmental impact statement.

Technical Expert, Orange County Groundwater Basin, California. Served as an expert witness and provided deposition regarding hydrogeologic conditions and numerical groundwater flow and transport modeling associated with the shallow, principal and deep aquifers of the Orange County Groundwater Basin. Focus was on groundwater flow, Irvine Ranch Water District well field-caused hydraulic gradient changes, and the potential for shallow contamination to reach the principal and deep aquifers.

Technical Expert – Hydrogeology of Proposed Yucca Mountain Nuclear Waste Repository, Nevada. Technical expert representing the County of Inyo, California relating to potential impacts to water resources in the County of Inyo including downgradient groundwater/spring water users in the communities of Shoshone and Tecopa and ecological resources associated with springs and the federally designated Amargosa Wild and Scenic River and Death Valley National Park. Work has included reviewing existing numerical groundwater flow and transport modeling for the region, and running the carbonate-aquifer model (which covers portions of California, Nevada and Utah) developed by the U.S. Geological Survey to evaluate the effect of pumping related to Southern Nevada Water Authority water rights and applications on vertical hydraulic gradients beneath Yucca Mountain and preparation of comments to Supplemental Environmental Impact Statement for Groundwater (prepared and submitted during 2015).

Project Management and Water-Supply Well, Feather River Basin, Plumas County, California. Project management and hydrogeological services related to a restoration of the historic Heart K Ranch project along Indian Creek in the Feather River headwaters for the Feather River Land Trust. Work included organizing hydrogeological (including production well drilling) and engineering and irrigation subcontractors to complete infrastructure for the project in a brief timeframe (less than six months). Successful siting of the well resulted in yield more than two times greater than client expectations.

Groundwater Recharge Operations, San Joaquin Valley, California. Technical and operational review of groundwater recharge/replenishment operations throughout the San Joaquin Valley, California. Work included identifying all non-private groundwater replenishment facilities in the San Joaquin Valley, providing technical review of operations including periodicity of use, spreading-basin geometry, and reviewing surrounding environment (including potential liabilities) associated with the potential use of the operations as water-bird habitat.

Hydrogeologic Evaluation, Amargosa River Basin, California and Nevada. Principal in Charge and project manager for ongoing basin-wide investigation of the resources of the California-portion of the Amargosa River basin. Investigations have ranged from baseline data collection efforts to wide-ranging geochemical investigations (including isotope studies) of groundwater issuing from springs, from the Amargosa River, and from existing wells. Results have been groundbreaking and have resulted in ongoing reevaluation of the conceptual model of this part of the basin (more than 2,000 square miles) that had been held for nearly 50 years. Being a spring-fed river, the investigations along the Amargosa River highlight the evaluation interactions between surface water and groundwater. These data have been incorporated into multiple peer-reviewed journal articles and in U.S. Geological Survey report on the Lower Amargosa River Valley (Scientific Investigations Report 2018-5151).

Hydrogeologic Characterization and Flow Modeling, Big Valley Groundwater Basin, Lake County, California. Conducted numerical modeling analysis of the Big Valley Groundwater Basin (inclusive of Soda Bay) in Lake County, California as part of environmental review/feasibility study related to using the Kelseyville water system as an alternative water supply review for the Soda Bay area. The Soda Bay area is in complex volcanic terrain and has been previously served primarily by surface water from Clear Lake which is seasonally problematic due to water quality issues. Additionally, the numerical modeling provided estimates of streamflow depletion in Kelsey Creek due to groundwater pumping addressing concerns related to the Clear Lake Hitch, a California-state listed threatened species fish (also under federal review).

Hydrogeologic Characterization and Flow and Transport Modeling in Volcanic Terrain, Mono County, California. Served as expert witness and manager of environmental activities at 7,000-gallon gasoline release that occurred in faulted, volcanic terrain upgradient of a town water-supply well field. Work conducted at the site also included characterization of rock units including the use of rotary drilling and oriented-core drilling, surface and down-hole geophysical surveys, and extensive vapor and groundwater sampling. Developed a conceptual model and follow-up numerical groundwater flow and transport model to evaluate potential timing and magnitude of impacts to down-gradient town water-supply wells and associated remediation scenarios both to evaluate on-site remedial effectiveness and risk reduction associated with water supply.

Well Siting along the San Andreas Fault Zone, Lake Elizabeth area, Los Angeles County, California. Provided technical review and recommendations for future well siting in the Lake Elizabeth area. The Lake Elizabeth area is situated along the San Andreas Fault Zone, the lake being a manifestation of the fault zone (sag pond). Groundwater in this complex area is highly compartmentalized, and differences in well yields and groundwater quality can vary substantially in short distances. This work successfully informed the Lake Elizabeth Mutual Water Company in new well siting after previous well construction attempts.

555 12th Street, Suite 250 | Oakland, CA 94607
Main: (415) 967-6000 | Direct: (415) 967-6039
E-mail: azdon@rouxinc.com | Website: www.rouxinc.com

Andrew Zdon, P.G., C.Hg., CEG
Technical Director

Watershed Assessment, Flow Modeling and Impact Analysis for Potential Well-field, Sierra Nevada, Mono County, California. Consultant to Mammoth Mountain Ski Area in a joint project with the Mammoth Community Water District regarding water resources issues associated with a proposed land transfer with the Inyo National Forest, and the potential development of a water supply in an eastern Sierra watershed. Work involved developing conceptual model and associated preliminary numerical groundwater flow model of an eastern Sierra watershed, conducting field investigations to evaluate hydrogeologic parameters (including aquifer testing of potential water-supply wells) identified to be sensitive in the numerical model, and finalizing the numerical groundwater flow model through updating parameters and boundary conditions based on data obtained from the field investigations and performing a transient calibration. The final numerical model was used to evaluate potential groundwater impacts of the proposed project.

Seepage Modeling, Multiple Projects, New Zealand. Provided technical oversight for finite element groundwater seepage modeling (SEEP/W) and hydrogeologic evaluation of tailings mitigation, Coeur Gold Golden Cross Mine Tailings Impoundment, New Zealand. Modeling was conducted to evaluate practicability of tailings dam dewatering schemes. Additionally, conducted seepage modeling to evaluate effects and feasibility of dewatering for the Mangare Waste Treatment Plant Upgrade. This would ultimately lead to the biggest environmental restoration program to be undertaken in New Zealand including removing 500 hectares of oxidation ponds (the subject of the modeling) and restoring 13 kilometers of coastline.

Numerical Flow Modeling, Owens Valley, Inyo County, California. Hydrogeologic consultant for the Owens Valley Indian Water Commission through the development of hydrogeologic data gathering, development of conceptual models for the Lone Pine Reservation, Big Pine Reservation and Bishop Reservation areas of the Owens Valley, and development of numerical groundwater models for each of these areas. The models developed provide these Paiute/Shoshone tribes with tools to evaluate the impacts on local reservations of water resource activities conducted by outside agencies. This U.S. Geological Survey – peer reviewed modeling effort provided strong water management tools for the tribal community of the Owens Valley.

Water-Supply Feasibility Study, Inyo County, California. Principal in Charge for hydrogeologic services associated with a feasibility study for a potable water supply and fire-flow system for the community of Tecopa in Inyo County, California. Work was conducted under a California Department of Water Resources grant (Integrated Regional Water Management Planning – Proposition 84). Waters in the area typically have elevated dissolved solids and metals such as arsenic and residents routinely obtain water from distant sources. The study was being conducted under a grant from the California Department of Water Resources, and because of this work, a grant to implement the water system has been received and the facility constructed and operational.

Water Resource Assessments, Mono County, California. Served as consultant to Mono County conducting groundwater availability assessments for several Mono County communities including: Antelope Valley (West Walker River); Mono City and Lee Vining (Mono Basin), Crowley and the Tri-Valley areas (Owens River). Work included conducting field reconnaissance activities, developing groundwater recharge estimates, evaluating local groundwater budgets, identifying potential future impacts due to regional growth, water quality issues, etc. He has also provided hydrogeologic support to the County of Mono with respect to reviewing and evaluating groundwater modeling conducted to evaluate potential impacts caused by expansion of a geothermal plant in Mono County.

Groundwater-Supply Feasibility Study, San Mateo County, California. Currently conducting a feasibility/well siting study related to the development of a groundwater supply for the La Honda area in the northern Santa Cruz Mountains of San Mateo County. The area has relied on surface water for its water supply and groundwater is being considered as a supplemental source of water for the San Mateo County Community Service Area No. 7 water system.

Vineyard Water Resource Assessment, Lake County, California. Served as consultant to Shannon Vineyards to evaluate water supply for existing and future development of vineyards in Lake County, California. Investigation identified a previously unidentified aspect to the hydrologic conceptual model indicating that more groundwater may be available to support future development and potentially alleviate long-term concerns for local impacts to springs. Additional data collection and analysis was recommended to support these new findings.

Well Siting Analysis, Los Angeles County, California. Conducted analyses including fracture trace analysis to identify potential production well sites for the Elizabeth Lake Mutual Water Company. The area of the well will be within the trace of the San Andreas Fault Zone, resulting in a complex fracture analysis and review of existing of wells and springs.

PUBLICATIONS

Zdon, A., Love, A.H. (2020). "Groundwater Forensics Methods for Differentiating Local and Regional Springs in Arid Eastern California, USA." Environmental Forensics. https://doi.org/10.1080/15275922.2020.1836075.

Parker, S.S., Zdon, A., Christian, W.T., Cohen, B.S., Mejia, M.P., Fraga, N.S., Curd, E.E., Edalati, K., and Renshaw, M.A. (2020). "Conservation of Mojave Desert Springs and Associated Biota: Status, Threats and Policy Opportunities." Biodiversity and Conservation. https://doi.org/10.1007/s10531-020-02090-7.

555 12th Street, Suite 250 | Oakland, CA 94607
Main: (415) 967-6000 | Direct: (415) 967-6039
E-mail: azdon@rouxinc.com | Website: www.rouxinc.com

Andrew Zdon, P.G., C.Hg., CEG
Technical Director

Zdon, A. (2019). "An inventory of operational and planned groundwater recharge basins in the San Joaquin Valley, California." Prepared for Point Blue Conservation Science. https://data.pointblue.org/apps/data_catalog/dataset/california-ecological-data-layers.

Zdon, A., Rainville, K., Love, A.H., Buckmaster, N., and Parmenter, S. (2019). "Identification of source-water mixing in the Fish Slough spring complex, Mono County, California, USA." Hydrology 2019, 6. 26. https://www.mdpi.com/2306-5338/6/1/26.

Love, A.H., Zdon, A. (2018). "Use of Radiocarbon Ages to Narrow Groundwater Recharge Estimates in the Southeastern Mojave Desert, USA." Hydrology 2018, 5, 51. https://www.mdpi.com/2306-5338/5/3/51.

Zdon, A., Davisson, M.L., and Love, A.H. (2018) "Understanding the source of water for selected springs within Mojave Trails National Monument, California." Environmental Forensics, Volume 19, No. 2, 99-111. https://doi.org/10.1080/15275922.2018.1448909.

Zdon, A. (2017). "Water in the Desert? A Survey of Springs 2015-2016." Desert Report: News of the Desert from Sierra Club California and Nevada Desert Committee. June.

Potter, Christopher, Zdon, A., and Weigand, J. (2017) "Monitoring Springs in the Mojave Desert using Landsat Time Series Analysis. International Journal of Water Resources and Environmental Management, Volume 8, No. 2. December.

Zdon, A., Davisson, M. L., and Love, A.H. (2015) "Testing the Established Hydrogeologic Model of Source Water to the Amargosa River Basin, Inyo and San Bernardino Counties, California." Environmental forensics, v. 16,.4 pp. 344-355. https://doi.org/10.1080/15375922.2015.1091406.

Zdon, A. (2014) "Wading Deep: The Importance of Hydrological Monitoring." California Council of Land Trusts, Conservation Frontiers, Volume 5.3, July. 8 p.

Traylor, R.L., Zdon, A., Zawadki, A. (2001) "Identification of Areas for Potential Recharge Projects, New Well Siting Areas and Basin Source Water Assessment." Proceedings of the XXXI International Association of Hydrogeologists Congress Munich, Germany, 10-14 September 2001: New Approaches Characterizing Groundwater Flow. Pages 657-661.

Brothers, K., Tracy, J., Kaufmann, R. F., Stock, M., Bentley, C., Zdon, A., and Kepper, J. (1992) "Hydrology and Interactive Computer Modeling of Ground and Surface Water in the Lower Virgin River Valley, primarily in Clark County, Nevada." Las Vegas Valley Water District, Cooperative Water Project, Series Report No. 1, 90 p.

Brothers, K., Buqo, T. S., Tracy, J., Kaufmann, R. F., Stock, M., Bentley, C., Zdon, A., and Kepper, J., 1993, Hydrology and steady state ground-water model of Cave Valley, Lincoln and White Pine Counties, Nevada: Las Vegas Valley Water District, Cooperative Water Project, Series Report No. 11, 48.

Zdon, A., ed. (1991) "Geology of the Las Vegas Region." American Association of Professional Geologists, Nevada Section, 1991 Field Trip Guidebook. Las Vegas, Nevada.

PROFESSIONAL AFFILIATIONS

National Ground Water Association

Geological Society of America

Society for Mining, Metallurgy and Exploration

SPEAKING ENGAGEMENTS

Edalati, E., Yuerong, M., Shih, B., Curd, E., Renshaw, M., Mejia, M.P., Wayne, R., Fraga, N., Zdon, A., Parker, S. (2020). "Environmental DNA and Biodiversity Assessment of Mojave Desert Springs." 2020 California Aquatic Bioassessment Workgroup and California Society for Freshwater Science Meeting. October 13.

Palacios, M., Edalati, K., Curd, E., Renshaw, M., Fraga, N., Zdon, A., Wayne, R., Parker, S. (2020). "Assessing Biodiversity of Mojave Desert Springs using Environmental DNA, Botanical Surveys, Geology and Ecoregion." Poster Presentation, 2020 California Aquatic Bioassessment Workgroup and California Society for Freshwater Science Meeting. October 13.

Rosen, S., Zdon, A. (2020). "PFAS in Eastern California." Webinar presented to Transition Habitat Conservancy and regional agencies and NGOs. May 12.

Zdon, A. (2019) "Current efforts for Baseline Understanding of Groundwater-dependent Ecosystems in Arid California," Oral Presentation, Los Angeles County Bar Association-Environmental Law Section Spring Symposium, Los Angeles, California (April 12, 2019).

Zdon, A. (2019) "Increasing our Understanding of Eastern California Springs: the Amargosa and Beyond." Oral Presentation, University of California White Mountain Research Station public lecture series, Bishop, California. (March 12, 2019).

Zdon, A. (2018). "Water – California's most precious resource," Oral Presentation, Oakland Museum of California, Oakland, California. (November 5, 2018).

Zdon, A. (2017) "Hydrologic Processes in a Shifting Climate in the Arid Southwest," Oral Presentation, 2017 University of California, Davis – California Department of Water Resources – Point Blue Conservation Science Riparian Summit, Davis, California. (October 18, 2017).

Zdon, A. (2017) "Spring Surveys for Land Trusts - Lessons Learned from a Regional Survey," Oral Presentation, 2017 California Council of Land Trusts,

555 12th Street, Suite 250 | Oakland, CA 94607
Main: (415) 967-6000 | Direct: (415) 967-6039
E-mail: azdon@rouxinc.com | Website: www.rouxinc.com

2017 Land Conservation Conference, University of California, Davis (March 2017).

Davisson, M.L., A. Zdon (2015) "Constraints on the Recharge Sources, Flowpaths, and Ages of Groundwater in the Amargosa River Valley", Oral Presentation with Abstract, 2015 Jim Deacon Memorial Devil's Hole Annual Workshop, Ash Meadows National Wildlife Refuge, Nevada. (May 7, 2015).

Belcher, W., D. Sweetkind, C. Hopkins, M. Poff, A. Zdon, L. Davisson (2015) "Evaluating Groundwater Flow Paths in Lower Amargosa Valley, Nye County, Nevada and Inyo County, California: Conceptual Model." Oral Presentation with Abstract, 2015 Jim Deacon Memorial Devil's Hole Annual Workshop, Ash Meadows National Wildlife Refuge, Nevada. (May 7, 2015 – Joint presentation with U.S. Geological Survey).

Love, A.H., A. Zdon (2015) "Assessing Limited Water Resources - Water Resources Forensics." 25th Annual International Conference on Soil, Water, Energy, & Air, San Diego, CA. Oral Presentation presented March 24, 2015.

Zdon, A., A.H. Love (2015) "Legal and Regulatory Considerations for Land/Water Conservation Science." California Council of Land Trusts Land Conservation Conference, Sacramento, CA. Oral Presentation presented March 6, 2015.

Zdon, A. (2015). "Southern California Water: Issues Facing the Conservation Community." California Council of Land Trusts Land Conservation Conference, Sacramento, CA. Oral Presentation presented March 5,2015.

Zdon, A., W. Belcher, D. Sweetkind, M. Poff, C. Hopkins (2015) "Hydrologic Characterization: A Crucial Component for Protecting Wildlife Habitat along the Amargosa Wild & Scenic River." Abstract and Oral Presentation, 2015. Amargosa Vole Working Group Meeting, Western Section of the Wildlife Society, Santa Rosa, CA. January 27. (Joint paper with U.S. Geological Survey).

Zdon, A. (2014) "Baseline Hydrologic Characterization of Springs in the California Desert: A Critical Component for Water Resource Management." Abstract and Oral Presentation, Devil's Hole Conference, Death Valley National Park. Presented April 30, 2014.

Zdon, A. (2014) "Understanding Your Water Resources." Workshop, California Council of Land Trusts Land Conservation Conference, Sacramento, California. March 5.

Zdon, A. (2013) "In the Footsteps of Early Researchers: Evolving Hydrologic Understanding in the California Desert." The 2013 National Ground Water Association Summit: The National and International Conference on Groundwater, San Antonio, Texas. June 1, 2013. Oral Presentation with Abstract.

Love, A.H., Zdon A., Philipp, J.R. (2013) "Testing the Established Regional Hydrologic Conceptual Model in the Amargosa River Basin, California and Nevada." The 2013 National Ground Water Association Summit: The National and International Conference on Groundwater, San Antonio, Texas. June 1, 2013. Oral Presentation with Abstract.

Zdon, A. (2013) "Water: The Missing Element in Land Conservation." The 2013 California Land Conservation Conference, California Council of Land Trusts, Sacramento, California. March 19, 2013. Concurrent Session leader and presenter.

Zdon, A. (2013) "Baseline Hydrologic Investigation and Monitoring, Amargosa River Wild and Scenic River System, California and Nevada." The 2013 California Land Conservation Conference, California Council of Land Trusts, Sacramento, California. March 19, 2013. Oral presentation.

555 12th Street, Suite 250 | Oakland, CA 94607
Main: (415) 967-6000 | Direct: (415) 967-6039
E-mail: azdon@rouxinc.com | Website: www.rouxinc.com

Appendix B

Water Supply Comments by Roux Associates, Inc.

Date: January 18, 2024

To: Jessica L. Blome, Greenfire Law, LLC

From: Andy Zdon, P.G., C.E.G., C.Hg.

Subject: **Water-supply Comments**
Mosaic Project Recirculated DEIR
Cull Canyon Road, Alameda County, California

Roux Associates, Inc. (Roux) is pleased to provide the following information regarding our review of the groundwater conditions/water-supply for the proposed Mosaic Project (Mosaic), as described in the Mosaic Project Recirculated Draft Environmental Impact Report (RDEIR, County of Alameda, 2023). The Mosaic Project is proposed as an "Outdoor Project Camp," a recreational facility including twelve 400-square foot cabins, an 8,500-square foot dining and meeting facility, a restroom/shower building, a 2,600-square foot dwelling, and 1200-square foot caretaker's unit. Two water-supply groundwater wells would be used to support the facility including a waste treatment system. Water uses would include domestic, agricultural, livestock and recreational uses. Three other wells on-site would be destroyed/abandoned.

Due to the absence of key hydrogeologic data and report(s), there are substantial data gaps that must be addressed for a reliable evaluation of water-supply, and project impact and feasibility to be presented. Absent that, the Recirculated RDEIR presents an inadequate account of water resource conditions and related project impacts.

Water-Supply Wells and Conditions

The RDEIR summarizes the several wells present on site, which includes five groundwater wells, only two of which will be used for the project water-supply, for the purposes described above. The remaining three wells will be abandoned per California-state well regulations. The two active wells are reportedly completed in the Miocene-aged Monterey Formation and therefore rely on fractures in the bedrock for groundwater flow. Fractured-rock aquifers are generally of low porosity, and groundwater levels may fluctuate widely based on seasonal and annual precipitation conditions and groundwater use within the catchment watershed.

The project site is next to Cull Canyon Creek, a stream that flows north to south. The RDEIR does not describe the characteristics of Cull Canyon Creek beyond its surface features and does not describe whether the stream "gains" streamflow from groundwater (is a gaining stream) or is a "losing" stream that recharges the aquifer. The water-supply wells are found in the lowermost, downgradient portions of the property. Waste-water treatment, gray-water use for agriculture or other purposes, agricultural and livestock operations, and other functions would occur upgradient of the two source wells.

The RDEIR provides limited information, such as well depth, and yield. However, more data relating to well construction, aquifer parameters, and overall watershed hydrology, including estimates of precipitation/recharge and existing water usage in the watershed, are necessary for evaluating the sustainability of water-supply for the given project.

The RDEIR on Page 4.14-5 notes that *"Balance Hydrologics was retained to conduct groundwater exploration and identify potential water supply sources for the project. Two wells were identified as potential production sources. Both wells are screened in consolidated sedimentary bedrock and were constructed in accordance with the requirements of Title 22 of the California Code of Regulations (CCR). A description of the wells is provided in Table 4.14-1, Production Well Description."* The text continues to

describe the results of aquifer testing of those wells and makes statements at various locations in the RDEIR that well interference was not observed, but the basis for these statements cannot be determined from the RDEIR.

At this time, Roux cannot evaluate the accuracy of the analysis and assertions related to water-supply as the RDEIR-referenced report by Balance Hydrologics describing their work, conclusions and recommendations does not appear in the RDEIR or its appendices. The Balance Hydrologic report serves as a foundational document, a basis for the design and feasibility of the project. Methodologies used for aquifer testing, including location of well discharge relative to monitored wells, groundwater-level hydrographs of well monitoring data recorded during aquifer testing, and other information required to evaluate the completeness and accuracy of the water-supply analysis are not provided. Understanding the timing of the testing, and whether and to what extent the wells have been used since those tests, are all important for understanding the condition and potential yield of those wells in current time.

Additionally, it is unclear if an evaluation of the existing watershed groundwater usage and the incremental changes in groundwater budget for the watershed has been prepared. As described in a Local Climate Change Snapshot (Cal-adapt, 2024) increasing ambient temperatures will occur in the coming decades. Increasing temperatures will also result in greater evaporation and decreased groundwater recharge despite relatively constant precipitation conditions.

Groundwater Conditions

Groundwater levels in fractured-rock aquifers can vary widely seasonally and year to year. Two important limiting factors on well output are interactions between groundwater and surface water, and conditions that may buffer those effects. The RDEIR provides undated point in time groundwater levels for each of the two water-supply wells. Point in time groundwater levels are of little purpose for this analysis, as it ignores natural seasonal and annual fluctuations associated with changes in precipitation and groundwater recharge. This is particularly difficult to interpret if the date of the groundwater level is of substantial age and bears little relevance to current conditions. Further, when groundwater levels drop (e.g., during drought periods), the transmissivity (a parameters describing the aquifer's ability to transmit water) of the water-bearing zone will also drop, as that parameter is a function of saturated thickness of the zone. Decreased transmissivity will result in greater drawdown for a given well yield. Therefore, hydrographs of groundwater levels and/or elevation over time in each of the wells should be provided to assure that sufficient water is present in the wells to sustain the project. Further, the water-well logs should be attached to the report (and are likely in the Balance Hydrologics Report) to enable the implications of groundwater level to well depth and construction to be independently evaluated. Well logs are not proprietary information in California.

Additionally, based on the provided comments, it is unclear if an evaluation of the existing watershed groundwater usage and the incremental changes in groundwater budget for the watershed has been previously prepared. This is important to assess whether there is sufficient groundwater present to accommodate added stress on the bedrock aquifer being pumped.

Hydrology

The Balance Hydrologics report is not referenced in RDEIR Section 4.8, assessing impacts on hydrology and water quality. This appears to be an oversight, as the interactions between groundwater and surface water in an environment such as this is critical to understanding project impacts to water quantity and quality. For example, as described earlier, the wells are located along the downgradient section of the project site. Absent an understanding of groundwater and surface water interactions, including septic systems and gray-water use, there is considerable uncertainty concerning potential impacts to groundwater quality within the area of the water-supply wells' groundwater capture zone as a capture analysis does not appear to have been conducted.

Water Use

Correlating groundwater availability to projected water-supply needs is critical. The Balance Hydrologic report that is referenced in the RDEIR may provide key information for this determination. For example, what are the assumptions behind the "rated capacity" of each well as presented in Table 4.14-1? Based on our experience in water-supply related projects and given the low well yields (less than 5 gallons per minute) we do not believe that one of these single low-capacity wells could be relied upon to provide for all uses (particularly during drought periods) inclusive of maintaining sufficient water in storage for fire flows, while the other well is simply used as a backup supply. Are there alternatives for backup supply inclusive of trucking in water? Were there limitations or recommendations noted by Balance Hydrologics that do not appear in the RDEIR? These are questions that the RDEIR leaves unanswered. Additionally, wells are not designed to run 24 hours per day, 365 days per year. Periods of downtime for well maintenance, power interruptions, and other events can all affect overall well production.

A more-detailed project water balance is necessary but lacking here. The water balance is needed to provide an adequate accounting of the projected water supplies and uses, and the assumptions behind them. Such a water balance would not only include inflow and outflows (supplies and uses) for the project, but for the Cull watershed as well. If the groundwater in the watershed is already in a stressed condition, how the cumulative effects of the additional groundwater used by the project effects the watershed water balance is important for evaluating the project impacts.

Fire Flows

Based on the limited data provided in the RDEIR, and absence of the Balance Hydrologics report as an appendix, we are unable to evaluate the potential water-supply available for fire-flows to be supplied by the wells, or whether sufficient flow would be available from wells to meet those requirements. More detail is needed to evaluate the robustness of the water use estimates, and if the usage values provided may be underestimated. If so, greater reliance on storage for domestic and other uses would limit the volume of water stored to support fire flows, and impact whether the existing wells have sufficient yield to support sufficient water storage for all uses.

This is likely to be an increasingly critical part of the water-supply infrastructure. Based on the Cal-Adapt Climate Change Snapshot for Castro Valley, California (2024), by 2060, the average annual burned acreage in the area is predicted to double from current conditions. Absent the Balance Hydrologics report, and a review of the data related to the aquifer testing, the ability for the wells to maintain an adequate fire-flow water supply is wholly speculative.

Closing

Given the absence of detailed data, we are unable to provide further substantive review to assess the proposed water-supply for the proposed Mosaic Project based on the information provided in the RDEIR. Methodologies used for aquifer testing, including the location of well discharge relative to the monitored wells, groundwater-level hydrographs of monitoring wells used during aquifer testing, and other information necessary to evaluate the completeness and accuracy of the water-supply analysis are not provided. Additionally, the presence of detailed information concerning testing of the site for septic system use, while not providing the same standard of detail for water-supply indicates a substantial data gap that should be addressed to provide for a reliable water-supply, project impact, and feasibility evaluation. In its present form the Recirculated RDEIR presents an inadequate review of water resource conditions and related project impacts.

We appreciate the opportunity to comment on the RDEIR. Should you need further assistance, please contact Andy Zdon at (925) 640-7807, or by email azdon@rouxinc.com.

References

Cal-Adapt, 2024. Local Climate Change Snapshot, Castro Valley, California, 94552. January 13.

County of Alameda, 2023. The Mosaic Project Recirculated Draft EIR for Alameda County. December.

Local Climate Change Snapshot

Castro Valley

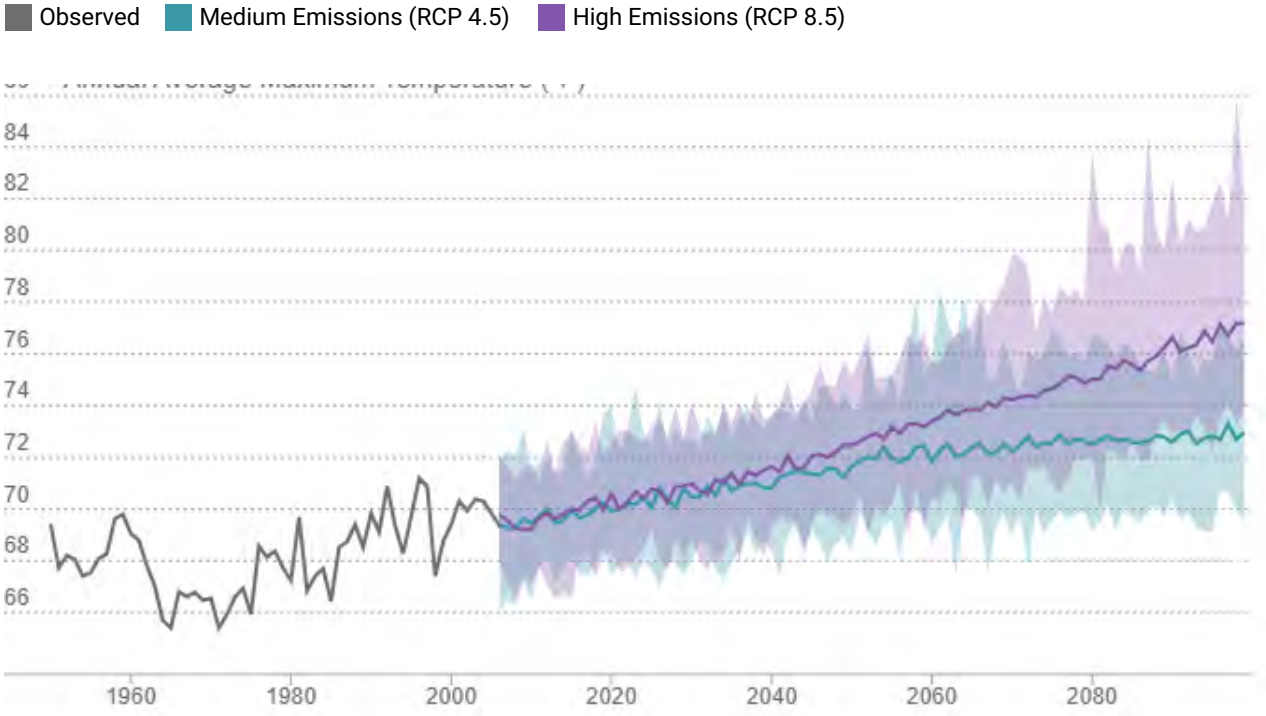
California 94552, United States

Temperature

Overall temperatures are projected to rise in California during the 21st century. While the entire state will experience temperature increases, the local impacts will vary greatly with many communities and ecosystems already experiencing the effects of rising temperatures.

Annual Average Maximum Temperature

Average of all the hottest daily temperatures in a year.



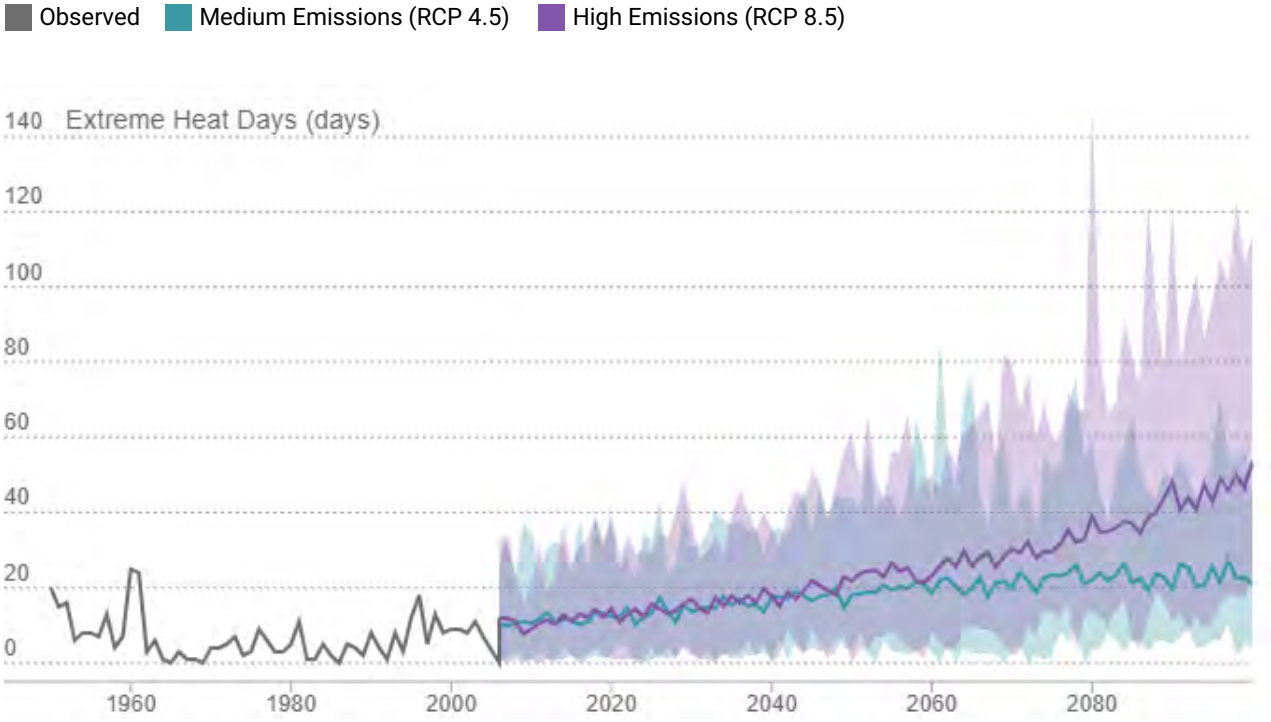
Observed (1961-1990) 30yr Average: 67.4 °F

	Change from baseline ⓘ	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	68.1 °F	67.9 - 68.4 °F
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	+3.5 °F	71.6 °F	70.2 - 73.1 °F
HIGH EMISSIONS (RCP 8.5)	+4.3 °F	72.4 °F	70.7 - 74.3 °F
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+4.6 °F	72.7 °F	70.9 - 75.0 °F
HIGH EMISSIONS (RCP 8.5)	+7.5 °F	75.6 °F	72.9 - 79.6 °F

1. Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.
2. Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.
3. Data presented is for LOCA grid cell (~ 6km x 6km resolution) at -122.038548,37.701431.

Extreme Heat Days

Number of days in a year when daily maximum temperature is above a threshold temperature



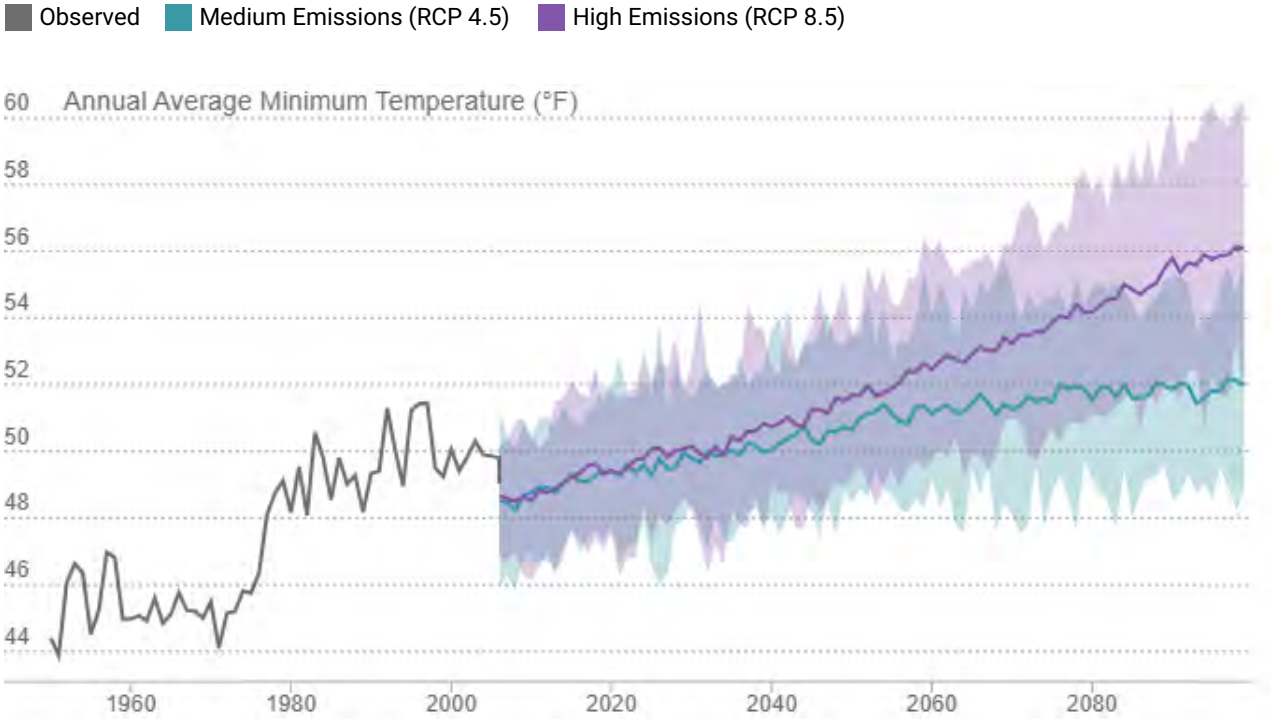
Observed (1961-1990) 30yr Average: 4 days

	Change from baseline ⓘ	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	6 days	4 - 7 days
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	+12 days	18 days	12 - 29 days
HIGH EMISSIONS (RCP 8.5)	+16 days	22 days	14 - 33 days
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+17 days	23 days	15 - 38 days
HIGH EMISSIONS (RCP 8.5)	+32 days	38 days	23 - 73 days

1. Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.
2. Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.
3. Data presented is for LOCA grid cell (~ 6km x 6km resolution) at -122.038548,37.701431.

Annual Average Minimum Temperature

Average of all coldest daily temperatures in a year. of 91.2 °F



Observed (1961-1990) 30yr Average: 47.0 °F

	Change from baseline ⓘ	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	47.4 °F	47.2 - 47.7 °F
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	+3.3 °F	50.7 °F	49.1 - 52.1 °F
HIGH EMISSIONS (RCP 8.5)	+4.2 °F	51.6 °F	49.9 - 53.1 °F
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+4.4 °F	51.8 °F	49.4 - 53.9 °F
HIGH EMISSIONS (RCP 8.5)	+7.4 °F	54.8 °F	51.9 - 57.8 °F

1. Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.
2. Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.
3. Data presented is for LOCA grid cell (~ 6km x 6km resolution) at -122.038548,37.701431.

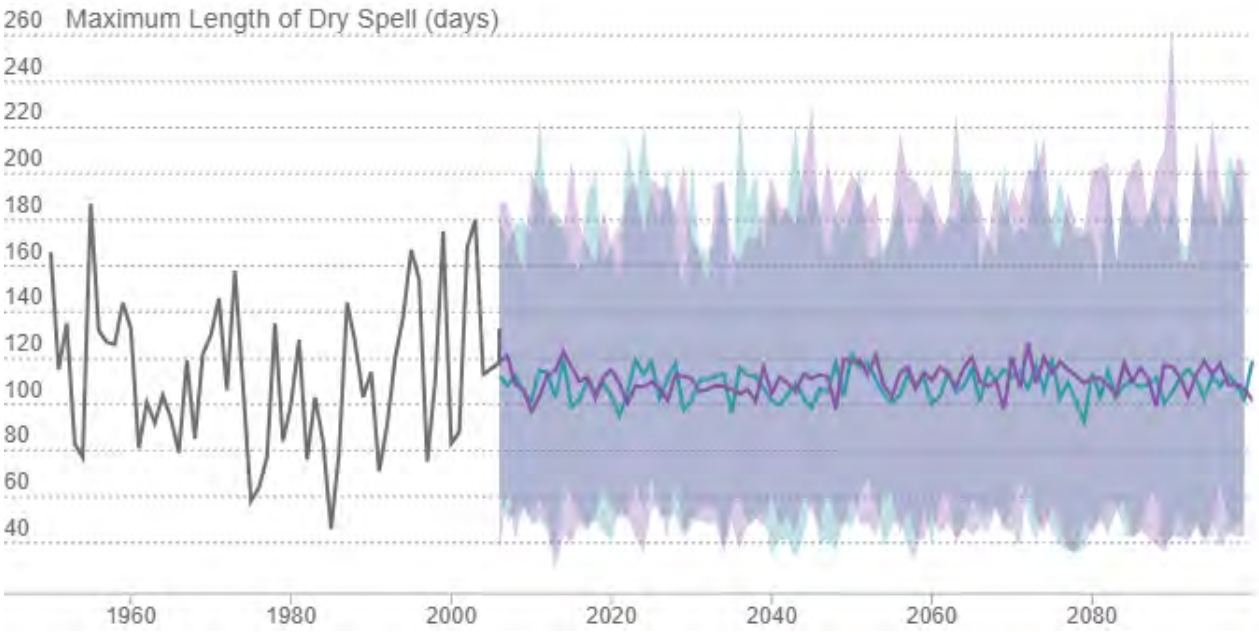
Precipitation

California's climate varies between wet and dry years. Research suggests that for much of the state, wet years will become wetter and the dry years will become drier. Dry years are also likely to be followed by dry years, increasing the risk of drought. While California does not see the average annual precipitation changing significantly in the next 50-75 years, precipitation will likely be delivered in more intense storms and within a shorter wet season. We are already seeing some of the impacts from a shift towards larger year to year fluctuations.

Maximum Length of Dry Spell

The maximum length of dry spell for each year. In other words, the maximum number of consecutive days with precipitation < 1mm for each year.

Observed Medium Emissions (RCP 4.5) High Emissions (RCP 8.5)



Observed (1961-1990) 30yr Average: 102 days

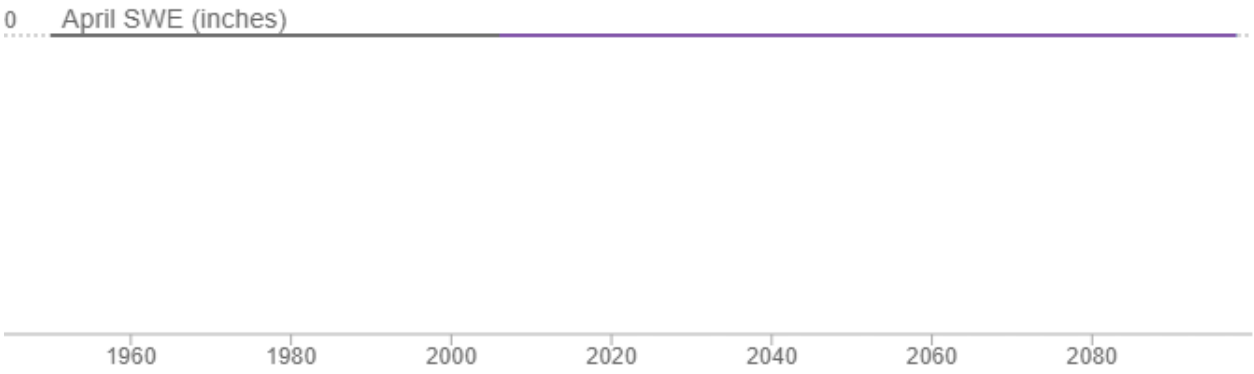
	Change from baseline ⓘ	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	103 days	90 - 120 days
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	+5 days	108 days	83 - 131 days
HIGH EMISSIONS (RCP 8.5)	+8 days	111 days	86 - 129 days
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+5 days	108 days	86 - 132 days
HIGH EMISSIONS (RCP 8.5)	+10 days	113 days	86 - 155 days

1. Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.
2. Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.
3. Data presented is for LOCA grid cell (~ 6km x 6km resolution) at -122.038548,37.701431.

April SWE

Snow Water Equivalent (SWE), is a commonly used measurement used by hydrologists and water managers to gage the amount of liquid water contained within the snowpack.

Observed Medium Emissions (RCP 4.5) High Emissions (RCP 8.5)



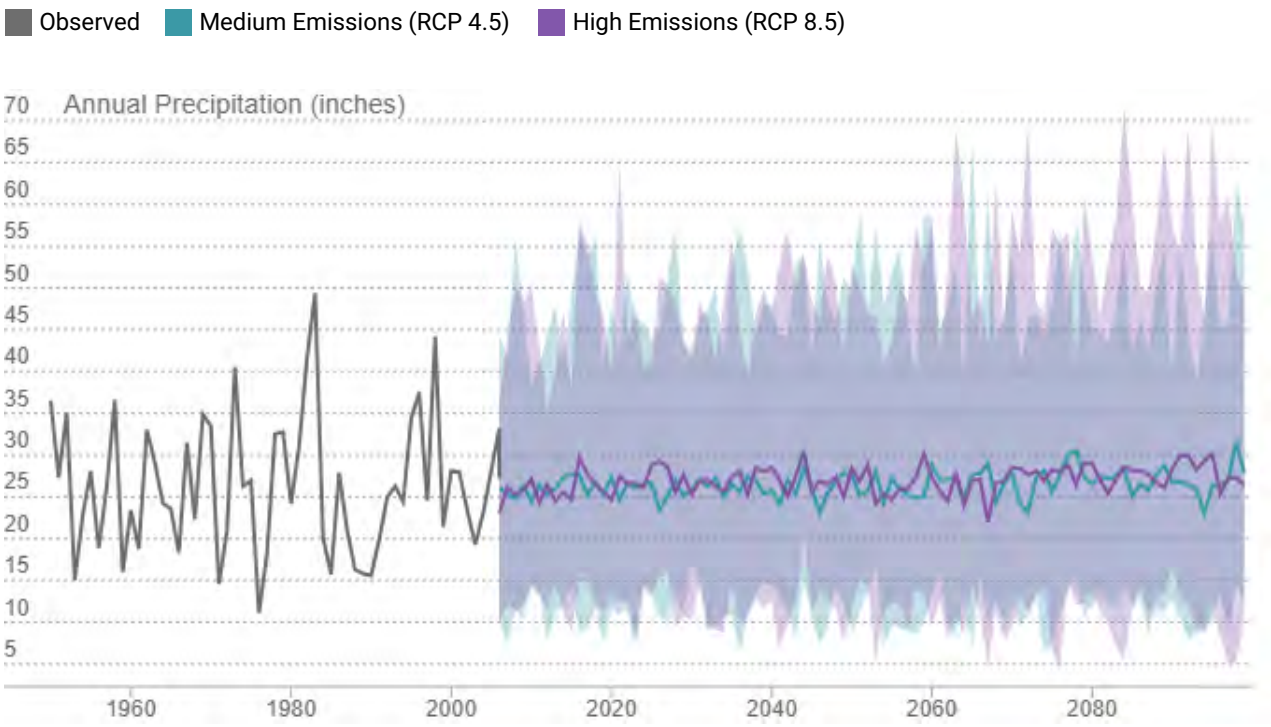
Observed (1961-1990) 30yr Average: 0.0 inches

	Change from baseline ⓘ	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	0.0 inches	0.0 - 0.0 inches
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	-	0.0 inches	0.0 - 0.0 inches
HIGH EMISSIONS (RCP 8.5)	-	0.0 inches	0.0 - 0.0 inches
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	-	0.0 inches	0.0 - 0.0 inches
HIGH EMISSIONS (RCP 8.5)	-	0.0 inches	0.0 - 0.0 inches

1. Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.
2. Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.
3. Data presented is for LOCA grid cell (~ 6km x 6km resolution) at -122.038548,37.701431.

Annual Precipitation

Total precipitation projected for a year



Observed (1961-1990) 30yr Average: 25.7 inches

	Change from baseline ⓘ	30yr Average	30yr Range
Baseline (1961-1990)			
MODELED HISTORICAL	-	26.4 inches	24.2 - 28.7 inches
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	-0.2 inches	26.2 inches	22.8 - 35.3 inches
HIGH EMISSIONS (RCP 8.5)	+0.4 inches	26.8 inches	22.0 - 34.4 inches
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+0.6 inches	27.0 inches	22.3 - 34.1 inches
HIGH EMISSIONS (RCP 8.5)	+1.5 inches	27.9 inches	19.2 - 37.7 inches

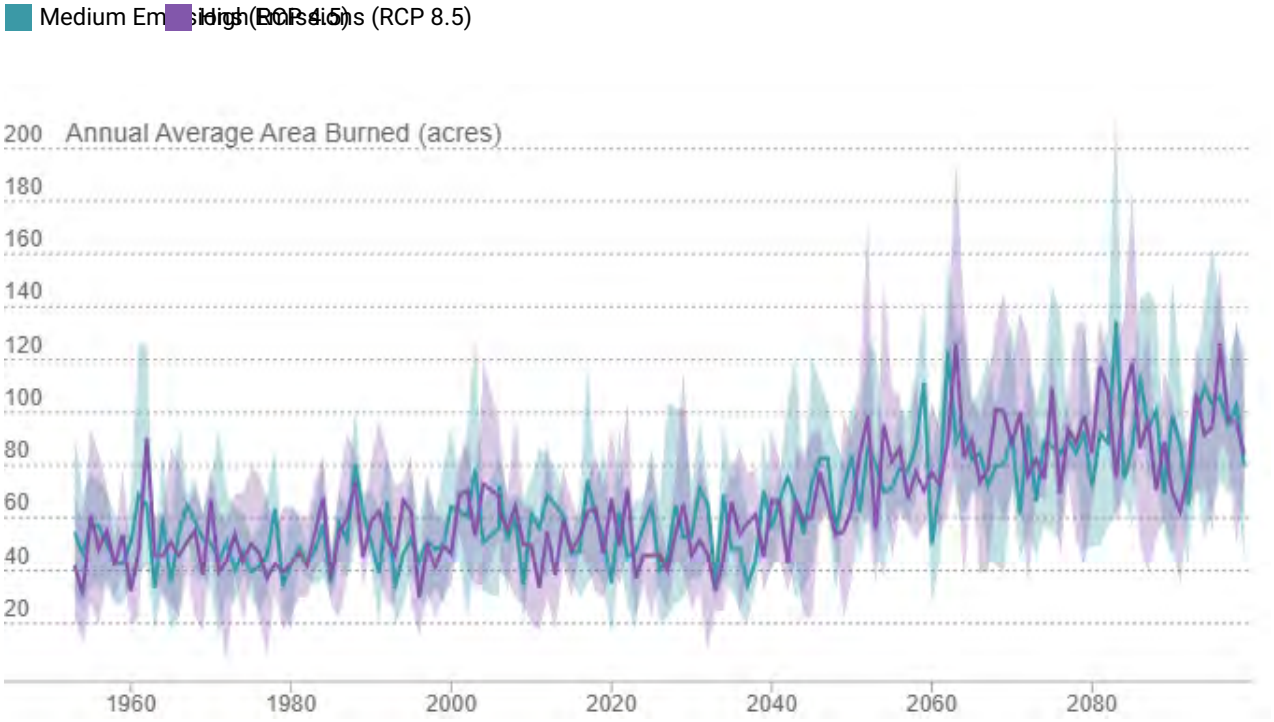
1. Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.
2. Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.
3. Data presented is for LOCA grid cell (~ 6km x 6km resolution) at -122.038548,37.701431.

Wildfire

The frequency, severity and impacts of wildfire are sensitive to climate change as well as many other factors, including development patterns, temperature increases, wind patterns, precipitation change and pest infestations. Therefore, it is more difficult to project exactly where and how fires will burn. Instead, climate models estimate increased risk to wildfires. The Annual Average Area Burned can help inform at a high level if wildfire activity is likely to increase. However, this information is not complete - many regions across the state have no projections (such as regions outside combined fire state and federal protection responsibility areas), and more detailed analyses and projections are needed for local decision-making. These projections are most robust for the Sierra Nevada given model inputs. However, as we have seen in recent years, much of California can expect an increased risk of wildfire, with a wildfire season that starts earlier, runs longer, and features more extreme fire events. Fire danger is complex. It is impacted by human activity, vegetation, wind, temperature, relative humidity, atmospheric stability, etc. The Keetch-Byram Drought Index (KBDI) represents a simplified proxy for favorability of occurrence and spread of wildfire but is not itself a predictor of fire.

Annual Average Area Burned

Average of the area projected to be at risk to burning in a year.



	Change from baseline	30yr Average	30yr Range
Baseline (1961-1990)			
MEDIUM EMISSIONS (RCP 4.5)	-	50.8 acres	48.2 - 53.0 acres
HIGH EMISSIONS (RCP 8.5)	-	50.5 acres	49.1 - 53.4 acres
Mid-Century (2035-2064)			
MEDIUM EMISSIONS (RCP 4.5)	+21.4 acres	72.2 acres	67.9 - 76.2 acres
HIGH EMISSIONS (RCP 8.5)	+20.3 acres	70.8 acres	68.9 - 73.6 acres
End-Century (2070-2099)			
MEDIUM EMISSIONS (RCP 4.5)	+39.6 acres	90.4 acres	80.8 - 106.0 acres
HIGH EMISSIONS (RCP 8.5)	+40.7 acres	91.2 acres	86.9 - 99.3 acres

1. Data derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment. Details are described in Pierce et al., 2018.
2. Observed historical data derived from Gridded Observed Meteorological Data. Details are described in Livneh et al., 2015.
3. Data presented is for LOCA grid cell (~ 6km x 6km resolution) at -122.038548,37.701431.

Appendix C: Flooding and Road Hazards

1. Images of flooding on Cull Canyon Road (January 2023).






2. Cull Creek flooding at proposed Mosaic site.

(a) Photo showing erosion of bank and erosion barrier fence submerged; as viewed from road (January 2023).

(b) Link to video showing road hazards and flooding at Mosaic site and adjacent properties to north (January 2023): https://app.box.com/s/kb5npc83s9xh7zp1krbhsa6io0873cub.

3. Cull Canyon Road Restrictions and Additional Hazards.

(a) Vehicle weight restrictions and no secondary access routes or shoulder and turnouts above intersection with Columbia Drive.

(b) Emergency vehicles blocking road during fire emergency response in 2019.

(c) Link to video of school bus attempting to make turn into swimming area at wide section of road (below Columbia Drive): https://app.box.com/s/umvxcfr2zc126av5wjpgnv037vo8sk5s.

Appendix D: Evidence of Badger Activity in Area

Badger skull found in Cull Canyon by local resident (November 2022).

Exhibit B

WILDFIRES

Climate-linked escalation of societally disastrous wildfires

Calum X. Cunningham[1]*, John T. Abatzoglou[2], Crystal A. Kolden[2], Grant J. Williamson[1], Markus Steuer[3], David M. J. S. Bowman[1]

Climate change and land mismanagement are creating increasingly fire-prone built and natural environments. However, despite worsening fire seasons, evidence is lacking globally for trends in socially and economically disastrous wildfires, partly due to sparse systematic records. Using a 44-year dataset (1980 to 2023) we analyze the distribution, trends, and climatic conditions connected with the most lethal and costly wildfires. Disastrous wildfires occurred globally over this period but were concentrated in the Mediterranean and temperate conifer biomes. Disaster risk was highest where highly energetic daily fire events intersected affluent, populated areas. Economic disasters increased sharply from 2015 onward, with 43% of the 200 most damaging events occurring in the last decade. Disasters coincided with increasingly extreme climatic conditions, highlighting the urgent need to adapt to a more fire-prone world.

Wildfires are a fundamental Earth system process that influences ecosystem dynamics, biogeochemical cycling, and socioecological systems (*1*, *2*). Humans and our congeners have coexisted with fire for at least 400,000 years (*1*) and every continent except Antarctica has fire-adapted biomes (*3*). Despite this long coexistence with fire, anthropogenic climate change is now rapidly altering fire conditions around the world, presenting major challenges for inhabiting flammable landscapes (*4*, *5*).

Climate change has already caused fire weather to depart from its historical variability across ~20% of burnable land area globally (*6*), driven by rising temperatures and increasing vapor pressure deficit (*7*, *8*), leading to drier fuels (*9*), more extreme fire weather (*10*), and prolonged fire seasons (*11*). In some areas, these changes are compounded by high fuel loads stemming from a constellation of factors including long-term fire suppression, curtailment of Indigenous burning, spread of exotic species, and changes in land use and management (*12*). Consequently, fire activity is increasing in some regions, including the temperate forests of western Canada (*13*), Australia (*14*), the western United States (*15*), and high latitudes (*16*, *17*), contributing to a doubling of energetically extreme fires over the last 10 years (*17*). The societal effects of changing fire regimes, which emerge as outcomes of interactions among biophysical and social systems (*18*), are further compounded by increasing exposure caused by human population growth and an expanding and densifying the wildland-urban interface (WUI) (*19*–*22*).

Scientific papers and the media are pervaded by the notion that societally disastrous wildfires—those that cause major economic losses or deaths—are becoming increasingly common (*23*). Prior analyses do not support this view, with the most prominent analysis of fire disasters based on a long-term global disaster database, Emergency Events Database (EM-DAT), reporting no temporal trends in direct economic losses (1987 to 2014) and fatalities (1977 to 2014) caused by wildfires (*23*). The period since that analysis, however, has been punctuated by major fire disasters with disturbing regularity: In 2016, the Fort McMurray Fire caused 4 billion USD in damage, the costliest in Canadian history (*24*). In 2017, several major fires in California caused a combined 17 billion USD in damages, the largest losses at the time (*25*). In 2018, the Camp Fire [Paradise, California; 16 billion USD (*26*)] destroyed ~18,000 structures and killed 85 people, only to be eclipsed in 2023 by the Lahaina Fire (Hawaii) that caused 102 fatalities, the most lethal in modern US history. In January 2025, the urban conflagration in Los Angeles (Palisades and Eaton fires) was likely the costliest fire disaster in history, estimated at a combined 65 billion USD in direct losses (*27*). Outside of North America, major events have also occurred in Portugal (2017), eastern Australia (2019/2020), Algeria (2021), Greece (2018, 2021, and 2023), and Chile (2017, 2023, and 2024), with the most recent major Chilean event in Valparaíso causing 133 fatalities (*28*). In the context of this apparent string of wildfire disasters, there remains no systematic evidence of global changes in the frequency or magnitude of societally disastrous wildfires (*23*), which has likely been hampered by a lack of long-term, georeferenced global data on the socioeconomic impacts of fire, with many governments around the world keeping such information publicly unavailable (*29*, *30*).

We analyze systematic records of wildfire disasters from 1980 to 2023 to identify geographic and temporal trends in wildfire disasters. To do this, we harmonized two systematic global disaster databases that report economic losses and fatalities associated with wildfires. NatCatSERVICE (*31*) is one of the world's most comprehensive (but private) global disaster datasets compiled by Munich Re, a leading global reinsurance company. It follows a standardized methodology, with the dataset suitable for trend analysis from 1980 onwards (*31*). To complement NatCatSERVICE, we also incorporated the publicly available EM-DAT, compiled by the Centre for Research on the Epidemiology of Disasters (*32*). Using these data, we identified major disasters, defined here as events either causing 10 or more fatalities (matching EM-DAT's criteria) or the 200 largest economic losses (insured plus uninsured) as a percentage of a country's gross domestic product (GDP) at the time, providing an economic measure that is comparable across economies. Using this dataset, we (i) quantify changes in the frequency and magnitude of major wildfire disasters, (ii) characterize the pyrogeography of major wildfire disasters, and (iii) identify the climatic conditions associated with wildfire disasters and evaluate whether such conditions have become increasingly common.

Upward trend of disastrous wildfires

Across multiple metrics, there was strong evidence that wildfire disasters are increasingly burdening societies around the world. The frequency of major economic disasters caused by wildfires increased by a factor of ~4.4 from 1980 to 2023 ($P < 0.0001$, Fig. 1A). Of the 200 most damaging events, 43% occurred in the last 10 years (Fig. 1A). There was no evidence that the increasing trend is confined to a particular continent (table S3 and fig. S6).

Damage as a percentage of global GDP peaked in 2018 at 5.1 times higher than the 44-year average, totaling 28.3 billion USD and 0.03% of global GDP (Fig. 1, D and E). The large increase in absolute damage costs was strongly driven by North America (Fig. 1D), where prices are comparatively high. Total damage costs were strongly influenced by singular events (fig. S7), primarily in the western US, typifying the skewed distributions characteristic of natural disasters (*33*). There have been 43 billion-dollar events (2022 USD) since 1980, of which 51% occurred in the last 10 years (Fig. 1C). Although this trend was similarly dominated by North America, billion-dollar events also occurred in Asia, southern Australia, and Europe in the last decade (Fig. 1C).

The frequency of major fatality events causing 10 or more deaths ($n = 85$ events) increased by a factor of 3.1 from 1980 to 2023 ($P = 0.004$; Fig. 1B), during which the human population increased by a factor of 1.8. This increase in major fatality events highlights the most serious gap in the disaster adaptation pathway, wherein improved communication and evacuation planning can more effectively protect human lives (*34*). This may carry added benefits for saving property

[1]Fire Centre, School of Natural Sciences, University of Tasmania, Hobart, Australia. [2]Department of Management of Complex Systems, University of California, Merced, Merced, CA, USA. [3]Geo Risks, Munich Re, Königinstr. 107 Munich, Germany. *Corresponding author. Email: calum.cunningham@utas.edu.au

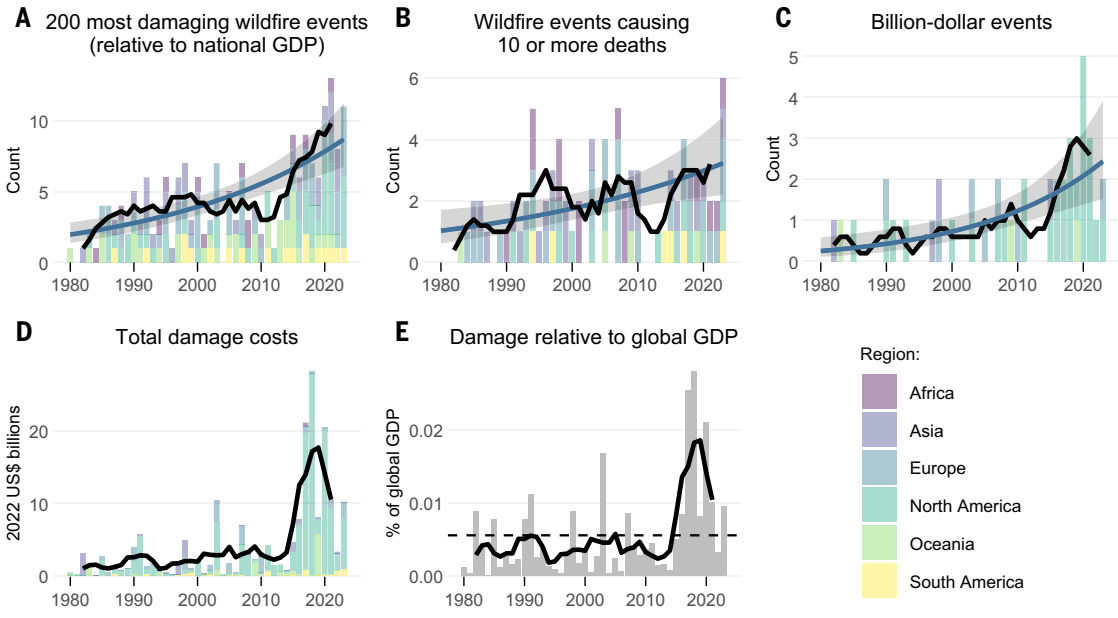


Fig. 1. Increasing frequency and severity of wildfire disasters. In each panel, the black lines show the 5-year rolling average. (**A**) Temporal distribution of the 200 most damaging wildfire events, measured as a percentage of a country's contemporaneous GDP. The blue line shows the fit of a generalized linear model (GLM) [± 95% confidence interval (CI)]. (**B**) Temporal trends in wildfire events that led to large losses of life, defined by EM-DAT as at least 10 fatalities, with the blue line showing the fit of a GLM (± 95% CI). (**C**) The annual frequency of billion-dollar events (2022 USD). (**D**) Total damage costs of wildfire disasters, calculated from all events (not just the top 200). (**E**) Total damage costs expressed as a percentage of global GDP, with the dashed line indicating the 44-year mean. See fig. S6 for separate regional graphs of (A) and table S4 for model coefficients for (A) to (C).

because firefighting resources can be redirected from search and rescue to structure protection (*35*).

Pyrogeography of major wildfire disasters

Major wildfire disasters occurred globally, but they had distinct pyrogeographic patterns and biome specificity (Fig. 2 and Fig. 3). Disasters were heavily concentrated in the Mediterranean forest, woodland, and scrub biomes (Europe, southern South America, western US, South Africa, and southern Australia) and the temperate conifer forest biome (mostly western North America), where disasters occurred 12.1 and 4.3 times more than expected based on the areas of those biomes, respectively (Fig. 2). Relative to the population sizes of the biomes, the temperate conifer forest, Mediterranean, and boreal forest biomes experienced 8.6, 6.7, and 8.6 times more disasters than expected based on their population sizes, respectively (Fig. 2).

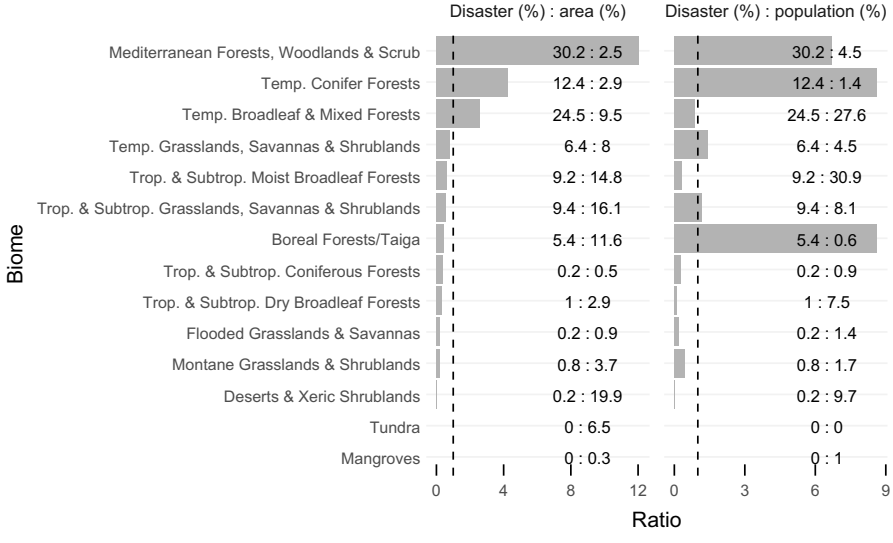


Fig. 2. Patterns in the distribution of major wildfire disasters relative to the areas and populations of biomes. The ratio was calculated by dividing the percentage of all major disasters occurring in a biome (left numbers in each subplot) by the percentage of the global area or global population in each biome (right numbers in each subplot). Values >1 (dashed vertical lines) indicate more disasters than expected based on the biome's area or population size, and values <1 indicate a lower-than-expected disaster rate. Biome population sizes in each year were based on the nearest available year (1990, 1995, 2000, 2005, 2015, and 2020) using the Gridded Population of the World datasets, v3 and v4 (*79*).

Building on these descriptive patterns, we constructed a disaster distribution model (Fig. 3), analogous to a species distribution model, to broadly characterize attributes that distinguish disaster locations from background locations. The best-performing of 56 competing models (out-of-sample $AUC_{ROC} = 0.91$; table S6) contained effects of (i) biome, (ii) human population density, (iii) per capita GDP, and (iv) the energy released by daily fire events, as defined by the 95th percentile of daily fire radiative energy (FRE_{95}).

Of the five metrics of fire activity that we considered—providing indices of biomass burned annually, fire intensity, daily fire energy, daily growth rate, and overnight fires (table S2)—locations with highly energetic daily fire events (FRE_{95}) best matched the distribution of disasters. Importantly, FRE_{95} strongly interacted with population density ($P < 0.0001$; table S7), demonstrating that the co-occurrence of highly energetic fire and denser human populations—not those attributes in isolation—substantially increases the risk of a major disaster (Fig. 3, B and C). A significant but weaker ($P = 0.02$; table S7) interaction between population density and per capita GDP indicates that disaster risk is higher in locations where moderate-to-dense human populations are also globally affluent (Fig. 3, D and E). Based on

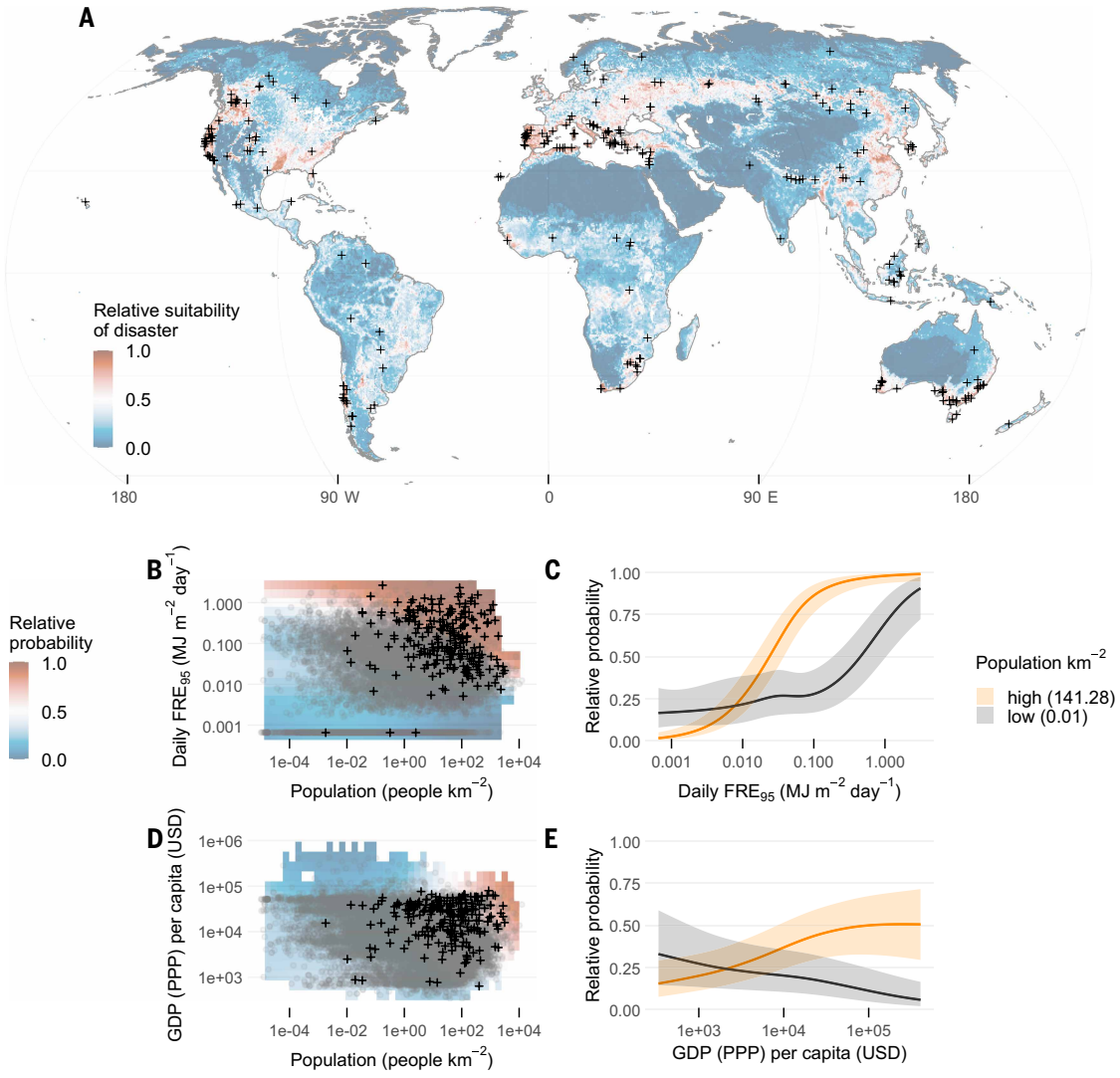


Fig. 3. Distribution of major wildfire disasters. (**A**) The locations of 242 major wildfire disasters, defined as the 200 most economically damaging wildfires (relative to contemporaneous national GDP) and events that caused ≥10 fatalities ($n = 85$), with 43 jointly comprising major economic and major fatality events. Crosses show disaster locations overlayed on relative risk predicted by a generalized additive model of disaster locations and background locations. (**B** to **E**) Effects plots show the model fit (± standard error), while holding other variables constant. In (D) black crosses show disasters and gray dots show background points. See table S5 for a breakdown of the number of events in the biomes of each region and fig. S4 for a map of the biomes.

these relationships, the model classified 10% of land globally as highly susceptible to wildfire disasters (i.e., prediction exceeding threshold set by the true skill statistic.)

The climate signature of wildfire disasters

Major wildfire disasters typically coincided with extreme fire weather and drought (Fig. 4, A and B), and such conditions increased in frequency and severity from 1980 to 2023 (Fig. 4C and 5). Extremes for fire weather index (FWI_{max}), vapor pressure deficit (VPD_{max}), and drought severity ($PDSI_{max}$; inverted Palmer Drought Severity Index) were each significantly higher during disasters compared with the same period in non-disaster years (Fig. 4B). FWI_{max} exhibited the largest difference, on average, at an estimated 1.65 standard deviations above the average FWI_{max} for the Julian days of each disaster (one-sample t-test; $P < 0.001$, $t = 20.5$; Fig. 4B). Fire disasters often coincided with concurrent higher-than-average fire weather, VPD, and long-term drought stress (Fig. 4B). For example, 85% of disasters occurred while FWI_{max} and VPD_{max} were both higher than the typical extreme value for the Julian days of each disaster (Fig. 4B). Further, 50% of disasters had FWI_{max} exceeding the 99.9th percentile of FWI (calculated over all days.)

The frequency and severity of such "fire disaster weather" increased substantially during the period 1980 to 2023. For example, the annual extreme value for the Julian days of each disaster showed a sustained migration from the lower-risk quadrant (bottom left) to the higher-risk quadrant (top right) of the bivariate relationships (Fig. 4C). FWI_{max}, VPD_{max}, and $PDSI_{max}$ were each significantly higher in the period from 2002 to 2023 compared with 1980 to 2001 ($P <$ 0.001 for all two-sample t-tests; Fig. 4C). Similarly, the percentage of days (FWI and VPD) and months (PDSI) exceeding the local 97.5th percentile (calculated over all days, corresponding to mean FWI_{max} during the disasters) increased by 2.1 times for FWI, 2.4 times for VPD, and 3.4 times for PDSI from 1980 to 2023 (Fig. 5). These dual findings—that major wildfire disasters are tightly linked with extreme conditions (Fig. 4B) and that climate change has substantially increased the frequency and severity of such "disaster weather" (Fig. 4C and 5)—suggest a considerable role of climate change in driving the increase of major wildfire disasters.

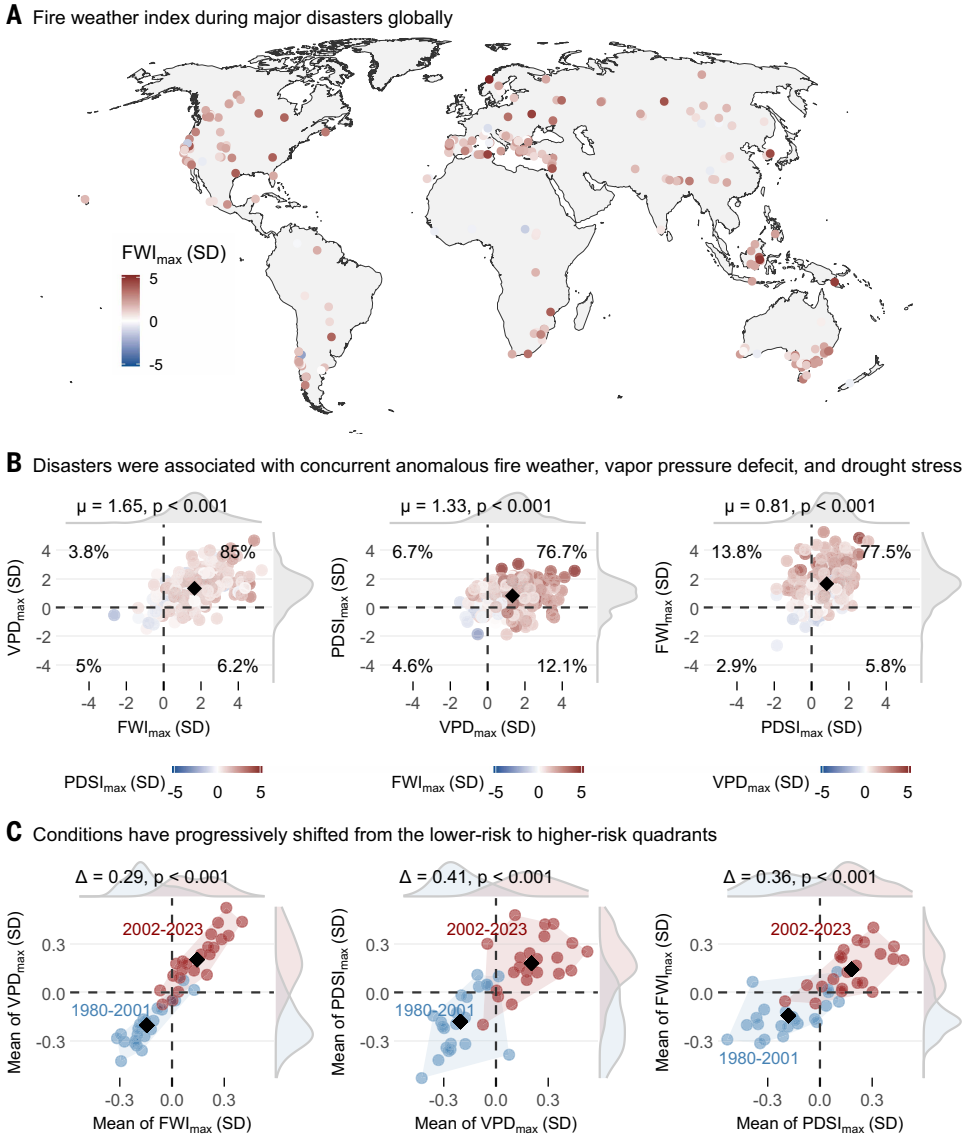


Fig. 4. Associations between major wildfire disasters and climatological conditions. For each disaster location, values were calculated by identifying the maximum value during the Julian days of each disaster in each year from 1980 to 2023. Values were *Z* score standardized by subtracting the mean and dividing by the standard deviation for the same Julian day ranges (for each location separately). (**A**) Globally, FWI$_{max}$ was almost always higher than the typical FWI$_{max}$ in the same period of other years. Points show FWI$_{max}$ (in standard deviations) of each fire disaster. (**B**) Disasters typically coincided with conditions that had high concurrent FWI$_{max}$, VPD$_{max}$, and PDSI$_{max}$ [×−1], relative to maximum values in the same periods of non-disaster years. Points show the anomaly during the disasters, black diamonds show the means, and *P*-values indicate the significance of a one-sample *t*-test of whether the disaster anomalies differed from the mean value (i.e., zero). (**C**) Extreme days have become drier with heighted fire potential from 1980 to 2023. Points show the mean extreme corresponding the Julian day period of each disaster (i.e., mean of 240 extreme values each year). Delta denotes the difference between mean values from 1980 to 2001 compared with 2002 to 2023, and *P* indicates the significance of two-sample *t*-tests.

Discussion

Our analysis provides systematic evidence that wildfires with major socioeconomic impacts are becoming more frequent and severe globally. The prior lack of evidence likely stems from difficulties of scientists collecting or obtaining long-term, globally consistent data on wildfire impacts and costs (*29*, *30*) (the main dataset used here is commercially private) and reflects a relatively recent surge in wildfire disasters that appears as a step change around 2015 (Fig. 1). Indeed, the most prominent analysis of EM-DAT disaster data reported no trend in wildfire fatalities or losses up until 2014 (*23*), around the time our analysis reveals an uptick in disasters. Some regions are disproportionately affected because of their biogeography, with the highest per capita disaster rates in the Mediterranean forest, woodland, scrub, temperate conifer forest, and boreal forest biomes where highly energetic daily fire events intersect populated areas. The connection between wildfire disasters and the daily energy released by fire events aligns with other work showing that those three biomes are disproportionately exposed to energetically extreme daily wildfire events, which have increased in frequency over the last two decades globally (*17*, *29*).

Disasters coincided with conditions unusually conducive to extreme fire, and climate change is making such "disaster weather" more common (Fig. 4C and Fig. 5). This finding fits with growing evidence that climate change is increasing fire weather (*10*, *11*, *36*), the number of days suitable for extreme daily fire growth (*37*), burned area in forests (*13*–*17*), coincidence of downslope winds and drought conditions (*38*, *39*), and night fires (during which firefighters have typically been afforded respite) (*40*, *41*). Indeed, other work shows that climate change has increased the probability of extreme fire weather by 40% in regions of California that experienced extreme fire disasters in 2017 and 2018 (*42*). Although there was a strong climate signal in our analysis of the disaster data, other processes including increasing exposure caused by an expanding and densifying wildland-urban interface, as well as agricultural land abandonment, are also likely implicated in the trend (*20*–*22*, *43*, *44*). Our study paints a broad picture that changing climatic conditions set the stage for increasing frequency of disasters, but climate conditions alone are not deterministic and other factors are also necessary. Such contextual differences necessitate finer-scale studies to reveal local-scale causes and illuminate opportunities for adaptation, such as building standards, fuel management, suppression approaches, forestry practices, and the role of fire behavior in different vegetation types (*45*, *46*). Radeloff *et al.* (*20*), for example, show that increases in burned area and the WUI have had similar-sized influences on the rising risk to houses in the US, and that this risk is most pronounced near grasslands and shrublands rather than forests.

Disasters were most likely to occur in populated areas that experience intense daily fire events and in places where dense populations are also relatively wealthy. Such exposure of globally affluent pockets of the WUI, in particular, is having substantial broader financial impacts. For instance, in response to major losses that wiped out more

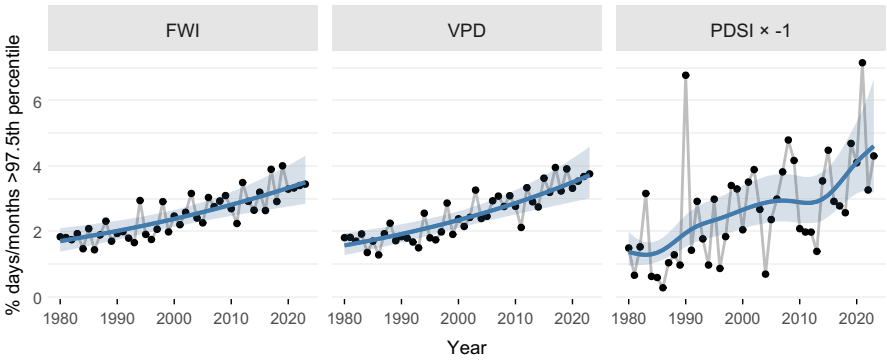


Fig. 5. Increasing frequency of extreme fire weather index, vapor pressure deficit, and Palmer drought stress index. Points show the percentage of days (FWI and VPD) and months (PDSI) in each year at the disaster locations that exceeded the 97.5th percentile value (which corresponds to mean FWI max during the disasters). calculated over all days from 1980 to 2023. The blue line shows the fit of a generalized additive model.

than twice the aggregate profits of the previous two decades (*47*), major home insurers in California have begun refusing to issue insurance policies because of rising financial exposure to wildfire catastrophes (*48*). Although events in lower-income countries often receive less attention because they cause smaller absolute losses, our approach of relativizing losses as a percentage of a country's GDP ensured that lower-income countries are captured in the global trends. However, even despite normalizing losses by GDP, it is possible that some bias remains, given probable differences among regions in ease of communication and media coverage of disasters (*49*, *50*). The map of disaster risk highlights some locations that may suffer non-negligible reporting biases, such as eastern China, where modeled disaster risk is high despite a modest number of disasters having been reported there (Fig. 3A).

Tragically, several major fire disasters occurred after the period of our analysis in areas predicted as extremely high risk (Fig. 3A), offering independent support for the model's predictive capacity. For example, in March 2025, South Korea experienced major wildfires that caused >30 fatalities and hundreds of millions of USD in damages in an area estimated by the model to have 99.8th percentile of global disaster risk (*27*). Similarly, devastating fires in Los Angeles (US, 2025), Valparaíso (Chile, 2024), and Jasper (Canada, 2024) occurred in areas with predicted risk levels in the 100th, 99.98th, and 99.6th percentiles, respectively.

It is important to note that the socioeconomic effects analyzed here represent only an index of the overall societal costs of wildfire as they do not include indirect losses or indirect fatalities. For example, the tens of thousands of fires that burned in Indonesia in 2015 were estimated to cause 1.2 billion USD in direct damage, but the World Bank estimated a much larger overall cost to the Indonesian economy of 19.9 billion USD [adjusted to 2022 USD; (*51*)]. Similarly, disaster datasets also underestimate wildfire fatalities and do not delineate civilian from firefighter (i.e., line of duty) fatalities, which likely have different patterns. Wildfires cause considerably fewer direct mortalities than earthquakes, floods, and storms (*23*); however, wildfires likely suffer a much larger underreporting problem because the indirect effects of smoke are diffuse, affect much broader regions, and usually go unquantified (*52*). For instance, EM-DAT reported 19 direct deaths from the 2015 Indonesian fires but the resulting smog that blanketed much of southeast Asia was implicated in as many as ~100,000 premature deaths from respiratory problems that are not present in such disaster databases (*53*). Globally, ~1.5 million fatalities per year are attributable to smoke from landscape fires (*54*). Thus, we caution that defining wildfire disasters based on direct losses and fatalities paints only part of the picture.

The increasing trend of wildfire disasters has occurred despite ballooning expenditure on fire suppression (*55*). Although global data is lacking (*56*), US federal expenditure on fire suppression increased by a factor of ~3.6 from 1985 to 2022, peaking at 4.4 billion USD in 2021 (fig. S8). This expenditure is likely limiting (or masking) the fire crisis but not offsetting it. There are several critical counterfactuals to consider, such as: (i) What would the trends in disasters have been in the absence of such investment or if suppression funds had been proactively spent on mitigation? (ii) Will trends change if climate effects outpace and overwhelm current firefighting resources during extreme wildfire events, such as recently occurred in the Los Angeles urban conflagration of January 2025 (*57*)? Investment in fire suppression capacity is essential but its overuse in the absence of proactive fire mitigation has produced the "fire paradox" in some locations (*58*) by encouraging development in fire-prone settings while making fires burn more intensely when they do occur (*59*), increasing the potential for catastrophe in the long run (*4*, *60*).

Many of the costliest disasters included in our analysis (e.g., Camp Fire, Lahaina Fire) began as wildfires but transitioned into urban conflagrations through building-to-building transmission. Calkin *et al.* (*61*) frame these fire disasters as a problem of urban environments encroaching on wildlands, leading to urban conflagrations that propagate through building-to-building transmission. This feature highlights the importance of strategies that reduce transmission, including retrofitting existing structures, using stringent fire-sensitive designs and materials in new builds, establishing defendable space, and removing nearby fuel in the home ignition zone (*62*–*65*). In the US, there have also been substantial calls for managed retreat from living in the WUI as an adaptive response to increasing wildfire disasters, but this neglects both the long history of Indigenous peoples coexisting with fire in such regions (*66*) and the potential for exacerbating housing shortages that already negatively affect socially vulnerable populations in high-cost regions such as California (*49*, *67*). Many of the wildfire disasters in our analysis occurred in areas that have been urbanized for centuries to millennia (e.g., Rhodes, Greece, and Cape Town, South Africa), suggesting that wildfire adaptation is a more viable strategy than avoidance.

Fire is an inevitable natural process essential for the health of fire-adapted ecosystems and modern societies must adapt to sustainably inhabit increasingly fire-prone landscapes (*4*, *23*). Our results show that disasters often occurred in regions with highly energetic daily fire activity, which points to the need to proactively manage WUI ecosystems so that fire does not become uncontrollably intense. The path forward must welcome the ancient wisdom and skills of Indigenous cultural burning, which has in some regions led to more open landscapes amenable to low-intensity fire (*68*–*70*). Management of fuels through targeted prescribed burning can reduce the intensity of fire (*71*) but reintroducing fire to thickened vegetation is not always straightforward, in which case newer approaches such as mechanical thinning followed by prescribed fire may provide a pathway to reinstating low-intensity fire regimes (*72*–*75*). Mitigation must also address strategies to reduce fatalities by increasing evacuation effectiveness, especially for socially vulnerable populations who are the most likely to be killed in wildfires (*49*), as well as designing fireproof structures and defensible spaces where people can "shelter in place" (*76*). As with all fuel management strategies, best approaches will depend heavily on ecological and social context (*4*). To quell the emerging fire disaster crisis and adapt to an increasingly fire-prone climate, we must urgently test, embrace, deploy, and incentivize the

diversity of available mitigation options at scales ranging from the wildlands to the home ignition zone (*5*).

REFERENCES AND NOTES

1. D. M. J. S. Bowman *et al.*, *Science* **324**, 481–484 (2009).
2. N. Andela *et al.*, *Science* **356**, 1356–1362 (2017).
3. S. Archibald, C. E. R. Lehmann, J. L. Gómez-Dans, R. A. Bradstock, *Proc. Natl. Acad. Sci. U.S.A.* **110**, 6442–6447 (2013).
4. M. A. Moritz *et al.*, *Nature* **515**, 58–66 (2014).
5. D. M. J. S. Bowman, J. J. Sharples, *Science* **381**, 616–619 (2023).
6. J. T. Abatzoglou, A. P. Williams, R. Barbero, *Geophys. Res. Lett.* **46**, 326–336 (2019).
7. Y. Zhuang, R. Fu, B. D. Santer, R. E. Dickinson, A. Hall, *Proc. Natl. Acad. Sci. U.S.A.* **118**, e2111875118 (2021).
8. A. Barkhordarian, S. S. Saatchi, A. Behrangi, P. C. Loikith, C. R. Mechoso, *Sci. Rep.* **9**, 15331 (2019).
9. T. M. Ellis, D. M. J. S. Bowman, P. Jain, M. D. Flannigan, G. J. Williamson, *Glob. Change Biol.* **28**, 1544–1559 (2022).
10. P. Jain, D. Castellanos-Acuna, S. C. P. Coogan, J. T. Abatzoglou, M. D. Flannigan, *Nat. Clim. Chang.* **12**, 63–70 (2022).
11. W. M. Jolly *et al.*, *Nat. Commun.* **6**, 7537 (2015).
12. L. T. Kelly *et al.*, *Annu. Rev. Environ. Resour.* **48**, 207–235 (2023).
13. M.-A. Parisien *et al.*, *Commun. Earth Environ.* **4**, 309 (2023).
14. J. G. Canadell *et al.*, *Nat. Commun.* **12**, 6921 (2021).
15. Z. A. Holden *et al.*, *Proc. Natl. Acad. Sci. U.S.A.* **115**, E8349–E8357 (2018).
16. M. W. Jones *et al.*, *Reviews of Geophysics* **60**, e2020RG000726 (2022).
17. C. X. Cunningham, G. J. Williamson, D. M. J. S. Bowman, *Nat. Ecol. Evol.* **8**, 1420–1425 (2024).
18. J. K. Balch *et al.*, *Earth's Future* **8**, e2019EF001319 (2020).
19. A. Modaresi Rad *et al.*, *Nat. Sustain.* **6**, 1343–1351 (2023).
20. V. C. Radeloff *et al.*, *Science* **382**, 702–707 (2023).
21. V. C. Radeloff *et al.*, *Proc. Natl. Acad. Sci. U.S.A.* **115**, 3314–3319 (2018).
22. F. Schug *et al.*, *Nature* **621**, 94–99 (2023).
23. S. H. Doerr, C. Santín, *Philos. Trans. R. Soc. B.* **371**, 20150345 (2016).
24. Munich Re, "Topics geo natural catastrophes 2016: analyses, assessments, positions" (Munich Reinsurance Company, 2017); https://www.preventionweb.net/publication/topics-geo-natural-catastrophes-2016-analyses-assessments-positions.
25. Munich Re, "TOPICS Geo: Natural catastrophes 2017" (Munich Reinsurance Company, 2018); https://biotech.law.lsu.edu/blog/302-09092_en.pdf.
26. E. Faust, M. Steuer, "New hazard and risk level for wildfires in California and worldwide" (Munich Reinsurance Company, 2019); https://www.preventionweb.net/publication/new-hazard-and-risk-level-wildfires-california-and-worldwide.
27. S. Bowen, B. Kerschner, J. Z. Ng, "Q1 2025 Natural Catastrophe and Climate Report Preliminary Overview" (Gallagher Re, 2025).
28. M. E. González, A. D. Syphard, A. P. Fischer, A. A. Muñoz, A. Miranda, *Science* **383**, 1424–1424 (2024).
29. D. M. J. S. Bowman *et al.*, *Nat. Ecol. Evol.* **1**, 0058 (2017).
30. D. Bowman, *Nature* **560**, 7–8 (2018).
31. "NatCatSERVICE Methodology" (Munich Re, 2018); https://www.munichre.com/en/solutions/for-industry-clients/natcatservice.html.
32. Centre for Research on the Epidemiology of Disasters (CRED), "EM-DAT: The International Disaster Database" (UCLouvain, 2023); https://www.emdat.be/
33. M. Coronese, F. Lamperti, K. Keller, F. Chiaromonte, A. Roventini, *Proc. Natl. Acad. Sci. U.S.A.* **116**, 21450–21455 (2019).
34. J. McLennan, B. Ryan, C. Bearman, K. Toh, *Fire Technol.* **55**, 487–516 (2019).
35. C. A. Kolden, C. Henson, *Fire* **2**, 9 (2019).
36. J. T. Abatzoglou, A. P. Williams, *Proc. Natl. Acad. Sci. U.S.A.* **113**, 11770–11775 (2016).
37. P. T. Brown *et al.*, *Nature* **621**, 760–766 (2023).
38. M. Goss *et al.*, *Environ. Res. Lett.* **15**, 094016 (2020).
39. J. T. Abatzoglou *et al.*, *Earth's Future* **11**, e2022EF003471 (2023).
40. J. K. Balch *et al.*, *Nature* **602**, 442–448 (2022).
41. K. Luo, X. Wang, M. de Jong, M. Flannigan, *Nature* **627**, 321–327 (2024).
42. L. R. Hawkins, J. T. Abatzoglou, S. Li, D. E. Rupp, *Geophys. Res. Lett* **49**, e2021GL095496 (2022).
43. P. E. Higuera *et al.*, *PNAS Nexus* **2**, pgad005 (2023).
44. G. Mantero *et al.*, *Landsc. Ecol.* **35**, 2723–2744 (2020).
45. D. M. J. S. Bowman *et al.*, *Ambio* **48**, 350–362 (2019).
46. D. M. J. S. Bowman *et al.*, *Nat. Rev. Earth Environ.* **1**, 500–515 (2020).
47. D. D. Evans, C. Webb, E. J. Xu, "Wildfire catastrophe models could spark the changes California needs" (Milliman White Paper, 2019); https://www.milliman.com/en/insight/wildfire-catastrophe-models-could-spark-the-changes-california-needs.
48. C. Flavelle, J. Cowan, I. Penn, "Climate Shocks Are Making Parts of America Uninsurable. It Just Got Worse" (New York Times, 2023); https://www.nytimes.com/2023/05/31/climate/climate-change-insurance-wildfires-california.html.
49. N. Lambrou, C. Kolden, A. Loukaitou-Sideris, E. Anjum, C. Acey, *Landsc. Urban Plan.* **237**, 104797 (2023).
50. R. L. Jones, D. Guha-Sapir, S. Tubeuf, *Sci. Data* **9**, 572 (2022).
51. The World Bank, The Cost of Fire (Indonesia Sustainable Landscapes Knowledge Note: 1, 103668, 2016).
52. F. H. Johnston *et al.*, *Nat. Sustain.* **4**, 42–47 (2021).
53. S. N. Koplitz *et al.*, *Environ. Res. Lett.* **11**, 094023 (2016).
54. R. Xu *et al.*, *Lancet* **404**, 2447–2459 (2024).
55. M. Burke *et al.*, *Proc. Natl. Acad. Sci. U.S.A.* **118**, e2011048118 (2021).
56. W. Mattioli *et al.*, *Int. For. Rev.* **24**, 15–29 (2022).
57. T. Brown, J. Shelton, *Nat. Sustain.* **8**, 329–330 (2025).
58. J. R. Arévalo, A. Naranjo-Cigala, *Fire* **1**, 44 (2018).
59. M. R. Kreider *et al.*, *Nat. Commun.* **15**, 2412 (2024).
60. R. J. Burby, *Ann. Am. Acad. Pol. Soc. Sci.* **604**, 171–191 (2006).
61. D. E. Calkin *et al.*, *Proc. Natl. Acad. Sci. U.S.A.* **120**, e2315797120 (2023).
62. S. Ondei, O. F. Price, D. M. J. S. Bowman, *Npj Nat. Hazards* **1**, 18 (2024).
63. A. D. Syphard, T. J. Brennan, J. E. Keeley, *Int. J. Disaster Risk Reduct.* **21**, 140–147 (2017).
64. A. D. Syphard, J. E. Keeley, *Fire* **2**, 49 (2019).
65. E. E. Knapp, Y. S. Valachovic, S. L. Quarles, N. G. Johnson, *Fire Ecol.* **17**, 25 (2021).
66. M. K. Anderson, in Fire in California's Ecosystems (Univ. of California Press, 2006). pp. 417–430.
67. K. McConnell, L. Koslov, *Environ. Res. Lett.* **19**, 041005 (2024).
68. M. Mariani *et al.*, *Front. Ecol. Environ.* **20**, 292–300 (2022).
69. V. Steffensen, in *Fire country: How Indigenous Fire Management Could Help Save Australia* (CSIRO Publishing, 2020).
70. M. M. Adams, *Fire* **7**, 222 (2024).
71. X. Wu, E. Sverdrup, M. D. Mastrandrea, M. W. Wara, S. Wager, *Sci. Adv.* **9**, eadi4123 (2023).
72. E. G. Brodie, E. E. Knapp, W. R. Brooks, S. A. Drury, M. W. Ritchie, *Fire Ecol.* **20**, 17 (2024).
73. E. L. Kalies, L. L. Yocom Kent, *For. Ecol. Manage.* **375**, 84–95 (2016).
74. K. T. Davis *et al.*, *For. Ecol. Manage.* **561**, 121885 (2024).
75. J. M. Furlaud, G. J. Williamson, D. M. J. S. Bowman, *J. Environ. Manage.* **344**, 118301 (2023).
76. "Gridded Population of the World, Version 4 (GPWv4): Population Density, Revision 11" (CIESIN, 2018); https://catalog.data.gov/dataset/gridded-population-of-the-world-version-4-gpwv4-population-density-revision-11.
77. C. X. Cunningham, Data associated with "Climate-linked escalation of societally disastrous wildfires", Figshare (2025); https://figshare.com/s/2537fa17289e1679e63d?file=54869792
78. C. X. Cunningham, Code associated with "Climate-linked escalation of societally disastrous wildfires", Figshare (2025); https://figshare.com/s/0237923cd37c44be2179?file=56123549
79. D. M. J. S. Bowman, P. C. McCormack, *Fire* **6**, 8 (2023).

ACKNOWLEDGMENTS

Funding: This work was funded by the following: Australian Research Council grant FL220100099 (to D.M.J.S.B.); National Institute of Food and Agriculture grant 2022-67019-36435 (to C.A.K.); National Science Foundation grant OAI-2019762 (to J.T.A.).
Author contributions: Conceptualization: D.M.J.S.B.; Methodology: C.X.C., J.T.A., G.J.W., C.A.K., and D.M.J.S.B.; Data: M.S. and C.X.C.; Investigation: C.X.C. and J.T.A.; Visualization: C.X.C.; Funding acquisition: D.M.J.S.B.; Supervision: D.M.J.S.B.; Writing – original draft: C.X.C.; Writing – review & editing: C.X.C., D.M.J.S.B., C.A.K., J.T.A., G.J.W., and M.S. **Competing interests:** The authors declare no competing interests. **Data and materials availability:** Data (*77*) and code (*78*) are archived at Figshare. The NatCatSERVICE dataset was provided to us in 2018 by Münchener Rückversicherungs-Gesellschaft (Munich Reinsurance Company) under a contractual condition prohibiting us from sharing it. In 2024, Munich Re provided updated estimates for the years 1980 to 2018. We thank Munich Re for providing the dataset. Requests for access to NatCatSERVICE data can be made via the web request form at https://www.munichre.com/en/solutions/for-industry-clients/natcatservice.html. We have attempted to make available the fullest version of the harmonized EM-DAT/NatCatSERVICE dataset while adhering to our contractual obligations. We have thus archived the harmonized dataset, with loss estimates redacted when based solely on NatCatSERVICE and a column denoting whether the event was "major." The repository also contains the time series derived from ERA5 climate data and fire metrics used in the distribution model, derived from MODIS active fire data (https://www.earthdata.nasa.gov/data/tools/firms.). EM-DAT data is publicly available at https://www.emdat.be/. Archived code allows reproduction of all analyses except Fig. 1, C to E, because providing those data would violate our contractual obligations with Munich Re.

SUPPLEMENTARY MATERIALS

science.org/doi/10.1126/science.adr5127
Materials and Methods; Figs. S1 to S8; Tables S1 to S7; References (*80*–*108*)

Submitted 4 July 2024; accepted 12 August 2025

10.1126/science.adr5127