COMMENTS	RESPONSES
Comment Letter O3c **Wildfire Risk & Mitigation Analysis Report** **Dr. Matthew Rahn, Ph.D., M.S., J.D.,** **Partner & Principal Scientist,** **Rahn Conservation Consulting, LLC** EXHIBIT B	

Comment Letter O3c

RAHN CONSERVATION CONSULTING LLC
ENVIRONMENTAL PLANNING SOLUTIONS

To: Carmen Borg, Urban Planner, Shute, Mihaly & Weinberger LLP
From: Matthew Rahn, PhD, MS, JD
Re: Harmony Grove Village South – Draft EIR, Wildfire Risk Analysis and Mitigation Measures
Date: June 13, 2017

Ms. Borg:

The following analysis is provided on behalf of Rahn Conservation Consulting ("RCC") at the request of Shute, Mihaly & Weinberger LLP. Our firm was retained to evaluate the Draft Environmental Impact Report ("DEIR"), Fire Protection Plan ("Plan"), and other associated documents related to wildfire risk and community protection for the Harmony Grove Village South Project ("Project" or "HGVS"), San Diego County, California (April 2017). For over twenty years, I have worked in the fields of environmental science and policy, with an emphasis on wildfires, land management, and planning (qualifications are provided in Appendix A). O3c-1

As proposed, the Project is located within the unincorporated area of San Diego County, which is classified as a "very high fire severity zone" by CAL FIRE. This area has a regular occurrence of wildfires with the most recent incident occurring in 2014. Given the fire history of the site, the complex topography, access issues, and surrounding vegetation, this area should be considered an extremely high-risk development zone. The proposed Project and its mitigation measures do not provide long-term assurances that adequate wildfire protection and community safety will occur. The DEIR and the Plan also fail to address increased risks under future climatic and vegetative conditions. Finally, the Plan fails to adequately address community risk and protection standards related to fire brands and structure fires within the community. O3c-2

If recent wildfire events in the area are any indication of the future, HGVS and surrounding communities are not only susceptible during "average" wildfire events, but are at considerable, and arguably catastrophic risk during higher intensity events (which are becoming more common in our region). Given that the backcountry is expected to experience drier climates, increased Santa Ana wind events, hotter temperatures, longer droughts, and increased abundance of invasive species, the risk of wildfire hazards will only increase in the future. In this case, the risk to the proposed community is so high that it is seemingly not a question of whether this area will experience a catastrophic loss, but when. Even more alarming is that alternative routes and access were dismissed without evidence that they are not feasible. The proposed Project would thus be constructed despite being noncompliant with emergency access standards where catastrophic losses are not only probable, but expected. O3c-3

1

Please see the Global Responses to Fire Hazard Impact Analysis and Adequacy of Emergency Evacuation and Access along with Responses to Comments O3a-24 through O3a-49 for more details regarding the following responses.

Response to Comment O3c-1

The County acknowledges these introductory comments; however, they do not raise an issue concerning the environmental analysis or adequacy of the EIR. Please see the responses below to specific comments.

Response to Comment O3c-2

The County disagrees with the stated opinions regarding the Project. The Project's Fire Protection Plan (FPP) recognizes that the area has been designated a very high fire hazard severity zone. As such, it is required to implement important fire safety measures including ignition-resistant construction materials and methods for all structures, fuel modification on the perimeter and throughout the Project, access, water, and many others (refer to the Project's FPP). Regarding long term assurance that the adequate wildfire protection and community safety will occur, the Project's FPP defines numerous fire protection and fire safety measures that are required to be implemented and maintained for the life of the Project. Additionally, it has been determined that adequate fire protection from existing fire response resources are available and can and will respond to the Project.

The FPP evaluates the climax condition for vegetation surrounding the Project. This is considered a worst-case condition that would produce the highest flame lengths. It is speculative at this point to presume future fire conditions based on climate change. Research indicates that vegetation in southern California may convert to lighter fuels as the result of more frequent fires. This would result from drier, hotter climates where fuels would convert to lighter flashy fuels through repeated wildfires and a change in the fire regime to one with lower intensity and faster spread rates. These types of fires may produce embers, but they include faster decay rates and enable firefighters better options for control. The comment's assertion that the Project has not adequately considered embers (fire brands) and structure fires is not accurate. The Project's FPP requires

	ember-resistant vents, beyond the code requirements, along with application of Chapter 7A which largely focuses on mitigating ember intrusion. Further, application of the latest code requirements, including interior, automatic sprinklers, addresses structure fires based on decades of code development aimed at minimizing structure fire occurrence, damage, and duration. **Response to Comment O3c-3** The Project's FPP analyzes and prescribes fire protection measures based on typical and extreme fire weather. The potential risk to the Project was evaluated to levels exceeding County requirements and results of the FPP, the Rohde & Associates independent fire study, as well as Rancho Santa Fe Fire Protection District (RSFFPD) and County review and evaluation, is that the fire protection features being provided lower the Project's fire risk to a less than significant level. It is speculative to make conclusions regarding future climates, especially given the varying scientific studies that indicate different future conditions. Several alternative routes for secondary access were evaluated and the results of that analysis is presented in the FPP, Appendix C. The results presented in that study are the culmination of County Planning, Biological, Fire and discussions with the Project applicant and the applicant's team. No additional analysis is considered necessary. Please see the Global Response to Fire Hazard Impact Analysis for response to the assertion that the Project would be non-compliant with County emergency access standards.

In summary, the following issues were identified in our review of the DEIR, Fire Protection Plan and supporting materials:

1) The DEIR and Plan fail to adequately describe the fire history and existing setting of the area;
2) Current understanding of fire branding and structure loss during a wildfire event is not adequately addressed in the DEIR and the Plan;
3) Evacuation plans, community design, and shelter in place measures proposed in the DEIR provide inadequate protection and assurance that the community can safely respond to severe wildfires;
4) The DEIR and Plan fail to adequately address future changes in precipitation, temperature, and wind;
5) The DEIR and Plan fail to consider how future land use change scenarios, invasive species, and habitat succession are expected to alter fire frequency and intensity;
6) The Plan as proposed does not adequately address actual wildfire community risks.

A detailed review of the Project is provided on the following pages, along with supporting references. If you have any questions, please feel free to contact me at any time.

O3c-4

Respectfully submitted,

Matthew Rahn, PhD, MS, JD

Partner, Principal Scientist
Rahn Conservation Consulting, LLC
(619) 846-1916
mattrahn@me.com

Response to Comment O3c-4

Summary comment noted. Please see Response to Comment O3c-2 and Response to Comment O3c-3. Additional detailed response to the listed items is provided in responses specific to these topics in Responses to Comments O3c-5 through O3c-49, below.

Table of Contents

Comment Letter O3c

1.0 Introduction

There is always an inherent danger in placing an urban development in what is currently an undeveloped wildland area located within an historic fire corridor. Although the DEIR and the related Wildfire Risk Assessment claim that the HGVS Project meets or exceeds fire and building code requirements, the Project does not comply with standards related to emergency access. Furthermore, the DEIR proposes modifications to local and currently accepted standards related to dead end roads and evacuation routes, but the proposed measures are untested and have not been evaluated under real-world scenarios. The DEIR provides no evidence that during an emergency these measures will provide the same or higher level of community protection and safety. If anything, based on the high risks at the Project site, the County should apply more stringent standards that have a proven record of success. O3c-5

Given that the proposed development is located in such a high risk wildfire area, it is incumbent on the County to integrate a prospective approach to decision-making and risk analysis. Unfortunately, the modified mitigation measures proposed in this Plan are tantamount to a community-level experiment, where untested measures are assumed to provide the same level of public safety that current code provides. O3c-6

2.0 Fire History

Given the topography, climate, and vegetation, the Plan mischaracterizes the extreme wildfire risk of the proposed site. As recognized throughout the DEIR and supporting documents, wildfires are regular occurrences in and around the project area. However, the analysis fails to adequately describe the modern risk, diluting the modern history of the site with data from before 1950, when records and fire assessments were spotty at best. Modern history shows that the fire return interval within three miles of the site is not seven years. Rather, the local area has had eighteen fires from 1980-2014, suggesting a modern fire frequency of less than two years. Furthermore, the characteristics of wildfires are underestimated with regard to wind-driven events, with the analysis suggesting average and peak wind velocities that are lower than the documented conditions that occurred during recent wildfires (including the Witch Fire in 2007). Finally, while the data used are from actual recorded wildfire events, the numbers of actual ignitions is likely much higher. The analysis should have provided an assessment of *all* the known ignitions and areas for high historic wildfire risk. This underestimate (and lack of assessment of future climatic and vegetative scenarios described later) creates a faulty foundation on which the analysis and subsequent mitigation measures are based. O3c-7

The DEIR and the Plan suggest that the development of the Project actually reduces wildfire risk because the project will result in the conversion of high risk fuels into an area of developed land with ignition resistant structures and landscaping. While there is no doubt that the development will remove existing habitat, simply placing a community within a high risk fire area does not reduce fire risk. To be certain, the risks still exist from the surrounding area, and the addition of a dense development into a high fire prone area has a long and demonstrated history of creating an environment where wildfires become O3c-8

4

Response to Comment O3c-5

Please see the Global Response to Fire Hazard Impact Analysis for response to the assertion that the Project would be non-compliant with County emergency access standards. The decision-making process used to determine consistency of the proposed alternative methods with the code are based on several months of evaluation by multiple professional fire planners and fire prevention officers. The list of measures providing justification for the County making findings that the measures meet the intent of the code included evaluation by Dudek fire protection planners, an independent third-party, Rohde & Associates, RSFFPD the agency providing fire service to the Project), and the County. Typically, these types of decisions are made by one fire agency within whose jurisdiction a project occurs. This Project is unique in that it included additional analysis and critique by multiple fire professionals with long histories of working throughout San Diego County and within the Harmony Grove area. Therefore, the County disagrees with the comment that the provided measures are untested and not suitable for making the appropriate findings.

Response to Comment O3c-6

The County disagrees that the proposed measures have not been tested and or observed in real world applications to provide fire protections in line with their intended uses at Harmony Grove Village South (HGV South). The FPP provides a list of fire protection features, many of which exceed the existing fire and building codes, which the RSFFPD and the County have deemed appropriate and adequate to make findings that the Project meets the intentions of the fire and building codes. The proposed features include a variety protections that have been proven through scientific testing and/or real world experience to reduce the potential fire impacts to residential communities. Providing structure related protections reduce the potential for ember penetration, landscape related protections set structures back from off-site fuels, road and parking related protections are designed to increase the flow of traffic and minimize obstructions, and resident educational protections raise the awareness of residents to their options during an emergency; all are measures that are in use in varying degrees throughout the County.

Response to Comment O3c-7

The County disagrees with the commenter's opinion that the wildfire risk has been mischaracterized. The Project's FPP and independent Rohde's & Associates report both analyzed the area's fire environment according to industry standard methods. The data used for the various fire behavior modeling was considered to represent worst-case conditions. Fire history includes all recorded fires occurring within a given area. The analysis considers the long term fire history, but does recognize that as areas develop, the fire environment changes. The frequency with which fires occur provides a data point, but is not the basis for Project design. As such, whether fires burn in a pattern of 2 years, 7 years, or some other period, is not germane to the discussion of wind direction, topography, etc. In fact, placing reliance on and assuming more frequent fires could lead to underestimation of available fuel to support a fire (not the case here). Fire patterns change as areas are converted from naturally vegetated areas to urban areas. Fire starts may increase, at least for a temporary period, but the average burned acreage is reduced due to the maintained landscapes, which are more ignition-resistant and the typical presence of fire response resources in urbanizing areas. The County further disagrees that the fire risk analysis creates a faulty foundation on which the analysis and subsequent mitigation measures are based. The FPP adequately recognizes that the area has been subject to wildfires, can have extreme fire behavior, and is within a Very High Fire Hazard Severity Zone (VHFHSZ). The FPP then proceeds to address the proposed structures, access, fuel modification, and other fire requirements consistently with the applicable codes. Finally, the comment includes a number of unsubstantiated claims. For instance, the comment states that the average and peak wind velocities used in the analysis are lower than the documented conditions that occurred during recent wildfires. The commenter also claims that while data used are from actual recorded wildfires events, the number of actual ignitions is "likely" much higher but fails to provide any information or evidence to substantiate this statement. Without further information to substantial such claims it is difficult to address such claims.

Response to Comment O3c-8

The comment mischaracterizes the FPP as concluding that merely removing existing habitat with the development of the Project will reduce fire risk. As previously described, the Project will implement important fire safety measures

	including using ignition-resistant construction materials and methods for all structures, and provide fuel modification on the perimeter and throughout the Project. The Project's FPP defines numerous other fire protection and fire safety measures that are required to be implemented and maintained for the life of the Project. Additionally, it has been determined that adequate fire protection from existing fire response resources are available and can and will respond to the Project. The County also disagrees with the comment's suggestion that well designed, master planned communities have a long and demonstrated history of posing higher risk to first responders, residents, and infrastructure. In fact, this type of development, where landscape level conversions to maintained, irrigated, ignition-resistant communities occurs, creates a large fuel break. With regard to the comment that the Project would result in a wildland/urban interface fire of higher risk, developments with the type of highly restricted, inspected and maintained structures and landscapes have been tested by fire within RSFFPD and have performed as designed.

Wildland Urban Interface ("WUI") fires, posing an even higher risk to our first responders, residents, and infrastructure. O3c-8

Today we are experiencing a shift in our natural fire regimes due to a multitude of anthropogenic factors, including man-made fires, increases in the wildland-urban interface, invasive species, and climate change. Since the 1970s the frequency and intensity of wildfires has increased across the United States, expanding from three million to an overwhelming eight million acres burned each year, with further increases projected.[1] A critical factor associated with wildfires is the current and continuing urbanization and the expansion of the wildland urban interface (WUI). As our region grows in the coming decades, decisions on where to locate future development and how to manage the WUI will determine our vulnerability and potential increases in wildfire risk. O3c-9

There are now 44 million homes in 50,000 communities at risk within the WUI in the US, and the annual cost of WUI fires nationwide exceeds $14 billion.[2] California, not surprisingly, has the highest number of WUI housing units of any state (5.1 million). Expansion of the WUI is particularly alarming in California, where half of the twenty largest wildfires in California's recorded history have occurred in only the past decade. Many of these events have had an unprecedented physical and financial impact to the state.[3] For example, the 2003 wildfire event that consumed much of San Diego County cost the region nearly $2.5 billion. More recently, the 2008 wildfires in northern California burned over 1.2 million acres, destroyed over 500 structures, and killed 15 people. O3c-10

Modern catastrophic wildfires are significantly different from the historic fire regime. Fires once started by lightning strikes or Native Americans would ignite smaller burn areas that created a heterogeneous vegetated landscape[4] whose patchiness created "natural fuel breaks" that prevented today's larger fire events.[5] Currently, only a fraction of the wildfires we experience in California are caused by natural events, with nearly ninety-five percent started by human activities. Future wildfire risk is not the exclusive result of human negligence or accidents. Rather, it highlights the concerns of firefighting agencies throughout the country: wildfire response and management must anticipate and adapt its practices and policies to deal with changing circumstances. O3c-11

3.0 Problems with Modeling and Planning

With regard to traditional modeling, the type of data used to generate models is extremely important. Given the limited amount of weather data used and and lack of consideration for modern trends in wind, temperature, and precipitation patterns, the amount of error and uncertainty is a concern. With weather records covering a questionable temporal and spatial distribution, it is not clear whether the extent of the records used is sufficient to O3c-12

[1] National Interagency Fire Center. 2007. Fire information: Wildland fire statistics, 1960-2006). Boise, ID.
[2] Nelson Bryner. 2012. National Institute of Standards and Technology, Wildfire Research Program. Personal Communication.
[3] Rahn , M.E. 2009. Wildfire Impact Analysis: 2003 Wildfires in Retrospect. San Diego State University. Wildfire Research Report No. 1. Montezuma Press. San Diego, CA.
[4] Bonnicksen, T. M. 2000. America's Ancient Forests: from the Ice Age to the Age of Discovery. John Wiley & Sons, Inc., New York. 594 p.
[5] Bonnicksen, T. M. and E. C. Stone. 1981. The giant sequoia-mixed conifer forest community characterized through pattern analysis as a mosaic of aggregations. Forest Ecology and Management 3(4): 307-328.

Response to Comment O3c-9

The comment is noted and will be before the decision makers during consideration of the Project. The potential risk to the Project was analyzed in accordance with County standards and a FPP was accepted by the RSFFPD.

Response to Comment O3c-10

The County appreciates the commenter's opinion but it is not at variance with the EIR and requires no further response.

Response to Comment O3c-11

The County appreciates the commenter's opinion but it is not at variance with the EIR and requires no further response.

Response to Comment O3c-12

The County disagrees with the commenter's assertion that the fire modeling is not adequate. It is unclear if the comment is intended for this Project as it mentions modeling conducted by HELIX. HELIX was not involved with fire modeling for HGV South. Regardless, the modeling conducted by Dudek utilized the latest fire behavior models, standard and extreme weather based on actual historical weather data from the HGV South area, and actual and projected vegetation conditions. The comment that the Rohde & Associates analysis states deficiencies in the Dudek modeling is inaccurate. Both modeling efforts (Dudek and Rohde & Associates) utilized the latest models. Both modeling efforts resulted in similar outputs for flame length, rate of spread, and ember travel. Between the two analyses, the fire behavior modeling was evaluated beyond that which typically occurs for projects in California, including in San Diego County.

make decisions or inferences about historical climatology or determine long-term trends and future conditions. There is a meaningful need to assess the effectiveness of the Plan across a range of WUI community types and exposure conditions, as the assumptions for modeling must be meaningful, justified, and appropriate.[6] Overall, the modeling provided in the DEIR and supporting documents does not adequately address future conditions, nor does it address actual worst-case scenarios. As noted by the Wildfire Risk Analysis, the modeling conducted by Helix is deficient in its scope, characterization of the vegetative communities, fuel modeling, and weather data.[7] The DEIR needs to update its analysis to reflect our best understanding of wildfire modeling and a more realistic assessment of risk that addresses rate of spread, indefensible areas, and overall community hazards.

O3c-12

3.1 Fire Branding, Modeling, and Community Risk

The Fire Protection Plan asserts that "fires from off-site would not have continuous fuels across this site and would therefore be expected to burn around and/or over the site via spotting." The Plan further states that burning vegetation embers may land on structures, but are "not likely to result in ignition based on ember decay rates that would not impact the types of non-combustible and ignition resistant materials that will be used on site."[8] Yet the Wildfire Risk Analysis acknowledges that because branding may "travel a minimum of 1/4 mile and as much as 1 mile ahead, the entire proposed development site would therefore be subject to significant fire branding."[9] These statements are contradictory.

O3c-13

As demonstrated by post-fire assessments by the National Institute of Standards and Technology (NIST), it is simply not true that embers and fire brands do not pose a significant risk to the proposed community. In fact, some of the most recent and devastating fires in our communities, including the nearby 2007 Witch Fire, were the result of impacts from fire brands and spotting that ignited homes within the interior of the community, and in some cases left homes at the perimeter unscathed. Current concepts of defensible space do not account for hazards of burning primary structures, hazards presented by embers, and the hazards outside of the home ignition zone, which is a serious deficiency in identifying actual risk.[10]

O3c-14

The Fire Protection Plan asserts that the potential for "off-site wildfire encroaching on, or showering embers on the site is considered moderate to high, but risk of ignition from such encroachments or ember showers is considered low based on the type of construction and fire protection features that will be provided for the structures."[11] However, given our current state of understanding about wildfires and how embers and brands actually lead to structure loss, this is an unsubstantiated and spurious assertion. Hardening of structures (e.g. building homes with materials or design features that reduce fire risk) is just one factor in structure risk and ignition. It is well documented that the actual operations and management of the community is just as important with regard to wildfire risk.

O3c-15

[6] Mell, W.E. et al. 2010. The wildland-urban interface fire problem – current approaches and research needs. International Journal of Wildland Fire. 19: 238-251.
[7] Rhode and Associates, 2016. Pg 3.
[8] Dudek. 2017. Fire Protection Plan. Harmony Grove Village South. Appendix L, Draft Environmental Impact Report, April 2017. Pg. 19.
[9] Rhode and Associates. 2016. Harmony Grove Village South. Wildfire Risk Analysis. April 2016. Pg. 13.
[10] Maranghides, A. et al. 2015. A Case Study of a Community Affected by the Waldo Fire. Nist Technical Note 1910.
[11] Dudek. 2017. Pg 27.

Response to Comment O3c-13

The County disagrees that the statements quoted from the FPP are contradictory. The FPP is stating that the fire modeling and practical experience acknowledges that there will be fire embers produced by off-site vegetation and that it may produce embers that blow onto and over the HGV South Project, but that the ignition resistance of the buildings and landscape features will be difficult to ignite and unlikely to sustain fire.

Response to Comment O3c-14

The County appreciates the comment regarding embers. Because the FPP identifies embers (pages 19 and 27) as a potential risk, it specifically addresses the most vulnerable component of a structure to embers, its vents. On page 33, it requires code-exceeding, ember-resistant vents for all structures, which combined with the ignition resistance of the latest building code for structures in VHFHSZs, provides an appropriate level of protection for the fire environment in which the Project occurs. Based on the ignition resistance of the structures to wildfire flames, the primary other means to any wildland urban interface structure is from burning embers/fire brands. The Project has addressed this by requiring code-exceeding, ember-resistant vents on all structures. The fire protection system that the Project will implement is based on these significant threats and mitigates the most likely avenues of ignitions, resulting in a development that is considered to include a relatively low risk.

Response to Comment O3c-15

The County disagrees with the assertion that the risk of structure fire from embers, as presented in the Project's FPP, is inaccurate. The County agrees with the comment that structure hardening is one factor is structure risk and ignition and that the operations and management of the community are also important factors. To that end, the FPP details the level of maintenance that will be required and because the Project occurs within RSFFPD, it will be subject to ongoing inspections, as currently occurs with similar communities. The landscape and structure exteriors will be required to be maintained as intended and described in the Project's FPP.

Examples throughout the recent literature show that even hardened structures can be lost when residents install ornamental landscaping, build attached decks, have outdoor furniture adjacent to the home, stack firewood next to the wall, allow plant material to build up in the eaves and gutters, or allow landscaping to dry out during droughts. These are just a few examples of how an average community functions. It is dangerous and irresponsible to assume that any community built in this area will maintain a level of vigilance, operations, and maintenance for wildfire protection; this level of dedication and oversight is simply improbable and unrealistic. Moreover, history has demonstrated time and again that any community placed within a high risk area can suffer catastrophic losses, regardless of planning, design, or best intentions. O3c-16

In fact (and as described below), it is recognized throughout the DEIR, the Plan, and other supporting documents that portions of HGVS would not be adequately protected. According to the Wildfire Risk Analysis, many of the existing properties in the area "generally lack defensible space" or safety zones and are "likely un-defendable" against critical fire behavior. In addition, the loss of these homes could "significantly contribute to fire intensity and fire branding," resulting in an estimated 15% of the homes being indefensible.[12] In addition, the report states that there exists critical exposure to chaparral fuels across two-thirds of the HGVS project site, creating a risk of impacts from direct flame, radiant energy, and heavy branding on the Project site.[13] The DEIR is obliged to evaluate and analyze the impacts of the Project, identify feasible measures to minimize, and mitigate the risks of severe fire, and consider alternatives that would reduce any significant impacts from the Project rather than just provide a triage of anticipated and acceptable losses. The Risk Analysis fails to meet this mandate and only further highlights how at-risk this community actually is and that losses are expected, if not inevitable. O3c-17

The modeling for the Project's fire hazard impacts does not adequately characterize the structure exposure conditions (heat flux from flames and firebrands generated by burning vegetation or burning structures) for a range of WUI fire settings (e.g. housing density, terrain, vegetative fuels, winds, wildland fuel treatments). The Plan is also deficient in failing to assess the vulnerability of structure design and proposed building materials when subjected to a given level of exposure or wildfire incident. Not all materials are rated the same and not all materials have been put through appropriate testing and rigorous assessments by which to compare benefits (if any) of the design elements or materials chosen. O3c-18

According to the National Institute of Standards and Technology (NIST), there is an urgent need to conduct a systematic, science-based, research effort to characterize how wildland fuel treatments alter the fire behavior, firebrand, and smoke generation from wildland fires. This must be done for wildland fires[14] and WUI communities,[15] and unfortunately has O3c-19

[12] Rhode and Associates. 2016.
[13] Rhode and Associates. 2016. Pg. 12.
[14] Carey H, Schumann M (2003) Modifying wildfire behavior – the effective- ness of fuel treatments, the status of our knowledge. National Community Forestry Center, Southwest Region Working Paper 2. Available at http: // maps.wildrockies.org / ecosystem_defense / Science_Documents/ Carey_Schumann_2003.pdf

Response to Comment O3c-16

Please refer to Response to Comment O3c-15. In addition, the type of accumulation of flammable materials described would not be allowed in HGV South due to the homeowners' association restrictions and the ongoing inspections by RSFFPD.

Response to Comment O3c-17

The County disagrees with the comment, which appears to confuse statements from the Rohde & Associates report. The comment quotes the Rohde & Associates report out of context. In fact, the statement regarding 15 percent of the homes being indefensible is referring to existing residences that are already built and not part of the HGV South Project. These homes are not part of a master planned community and each homeowner is responsible for maintaining landscapes and fuel modification areas as well as the ignition resistance of their homes. At the time of the inspection, Rohde & Associates identified a number of them that would be especially vulnerable to wildfire. These residences would not directly threaten the HGV South. Regarding the Rohde & Associates reference to chaparral on the site, again the comment takes the quote out of context. The reference was made as part of the general description of the Project site. If homes were to be built within or adjacent to chaparral fuels, then there would be concern for flames, radiant heat, and branding. However, the Project is not building within the chaparral vegetated areas and has set back structures appropriately with fuel modification zones adjacent to off-site scrub and grass fuels. Therefore, no additional response or analysis is necessary.

Response to Comment O3c-18

The County disagrees with this comment's assertion that the modeling conducted for the Project does not adequately characterize structure exposure conditions. The modeling evaluated the expected fire behavior for fuels directly adjacent to the Project's structures, which is the fuel that would have the highest impact. The perimeter fuel modification zones and site-wide landscaping restrictions, along with ongoing inspections and maintenance, separate flammable vegetation from the structures by at least 100 feet and/or reduce the fuel loads so that less heat is generated.

	Heat dissipates across distances and Cohen's (1995, 1996, 2000, 2003) research confirms that a distance of 30 feet (the Project provides at least 100 feet from native habitat) is adequate for separating the site's ignition-resistant structures from vegetation heat sources. The modeling also analyzed the ember production and exposure. All materials used for constructing the Project's structures will meet the highly restrictive requirements of the building code and the state fire marshal. Therefore, the comment requires no further analysis or response. **Response to Comment O3c-19** The County disagrees with the comment that additional analysis is required regarding firebrands. The Project has analyzed and addressed fire embers requiring code-exceeding, ember-resistant vents on all structures. The potential vulnerabilities expressed in the comment are vulnerabilities that every structure in the wildland urban interface faces. The fire protection system has been based on the significant threats and mitigates the most likely avenues of ignitions, resulting in a project that is considered to include a relatively low risk. Please refer to responses provided to comments in Sections 3.0 and 3.1 of this letter (above) for more information.

not been assessed for this Project. No real effort was made to address or quantify community exposure to ignitions from firebrands for this Project. Firebrands, from both vegetation and structures, are often a major source of structure ignition in WUI fires.[16] NIST has been actively engaged in WUI/firebrand research; results from this research should be included in modern planning. This is particularly important for the Project, since the majority of houses lost during local fires were not from direct flame contact, but rather from the intrusion of embers driven by winds.

O3c-19

Current wildfire research supports the need to augment and improve existing modeling and actual causes of structure loss as a high priority. Recently, NIST conducted a post-fire study of a community burned by the nearby Witch and Guejito fires during the October 2007 southern California firestorm.[17] Those fires destroyed 30% of the structures within the fire line, 40% of the structures on the perimeter (in closest proximity to wildland fuels), and 20% in the interior were destroyed. Firebrands were responsible for at least two out of every three structures lost. More worrisome is that the fire during this event spread up to 500 meters into the interior of the community. This demonstrates the importance of modeling for firebrands and of implementing protection measures during the planning process rather than relying solely on heat flux radiation or direct flame contact. Understanding the impact of firebrands and embers is a serious consideration for modern planning, and our current understanding of the causes of structure loss should be incorporated into the DEIR and supporting documents. This is particularly important for this Project, as much of the most insightful research on this topic was conducted on 2007 fires near the Project site.

O3c-20

3.2 Inadequate Emergency Access and Evacuation

The Fire Protection Plan states that secondary access for the project site is infeasible, citing challenges with biological resources, topography, and land-owner agreements/easements. Secondary access is not something that can be dismissed due to logistical constraints – it is a development standard for very important reasons. For example, the National Fire Protection Association 2016 standards provide guidelines for disaster planning, mitigation and evacuation, with experts roundly stressing that people should have multiple evacuation routes, if possible, as fire conditions can change rapidly.[18] Similarly, as described in the Plan, local and state standards emphasize multiple access routes for communities in high risk wildfire areas.[19] Ignoring this long-established and necessary requirement may potentially be acceptable in areas with low risk, but extreme fire risk areas, such as the HGVS site, should arguably never be approved without adequate secondary access.

O3c-21

[17] Mell et al.
[16] Maranghides A, Mell WE (2009) A case study of a community affected by the Witch and Guejito fires. National Institute of Standards and Technology, Technical Note 1635. (Gaithersburg, MD) Avail- able at http://www2.bfrl.nist.gov/userpages/wmell/PUBLIC/TALKS_PAPERS/NIST_Witch_Fire_TN1635.pdf [Verified 22 February 2010]
[17] Maranghides and Mell.
[18] National Fire Protection Association. 2016. 1600-Standard on Disaster/Emergency Management and Business Continuity/Continuity of Operations Programs.
[19] California Building Code (Chapter 7a) and County of San Diego Consolidated Fire Code (2014).

Response to Comment O3c-20

The County agrees with the comment that embers are a significant wildfire threat and that homes were lost in the 2007 wildfires from ember penetration. It is important to note that the homes that were lost from embers were not fitted with ember-resistant vents and were not subject to the type of inspections and maintenance that will occur at HGV South. Ember threats have been analyzed in San Diego County as a result of past fires and measures that are now required to build in VHFHSZs address the risk. In addition, the Project is incorporating measures beyond the code to prevent ember penetration. Therefore, the County appreciates the comment, but it does not raise an issue with the EIR's analysis or conclusions and no further response is necessary.

Response to Comment O3c-21

Please see the Global Response to Adequacy of Emergency Evacuation and Access.

A single access road is also problematic because such access does not allow efficient and safe movement of residents out of the area in a timely manner. With an estimated 1,500 to 1,800 vehicles (for just this community – depending on the analysis and report cited) attempting evacuation during a wildfire, a best-case evacuation time would take at least one hour and thirty minutes.[20] Given that the modeling predicts that wildfires can result in spread rates of 17 mph, the development and its evacuation route can become encircled by a wildfire in less than five minutes. Moreover, wind speed and direction of wildfires can change in unpredictable and rapid ways (something that is not accounted for in traditional modeling or this risk assessment). O3c-22

It is widely recognized that evacuations can result in traffic jams, traffic collisions, nervousness and panic, which can cause harm to people during fire events and result in a breakdown of the best designed plans. Evacuation is further complicated when having to evacuate large and small animals and residents with special needs. The DEIR as well as supporting documentation should be revised to address these issues. The DEIR should also include a comprehensive worst case evacuation scenario accounting for the total time that would be required to evacuate the entire surrounding community that ultimately uses Country Club Drive to Auto Park Way that addresses the population of Harmony Grove, Eden Valley, Hidden Hills and Elfin Forest. Unfortunately, none of this analysis was performed in the DEIR. O3c-23

Widening the road should be discussed not just for the section contemplated in the DIER, but also to ensure that residents are able to get "all the way out" to safety. It is not enough to simply address widening the section of road directly at the point of egress from the proposed development without a comprehensive analysis of broader evacuations and potential needs for extending the road widening to ensure full evacuation. Furthermore, direct flame impingement, radiant heat, heavy smoke, and limited visibility can significantly contribute to evacuation breakdowns. Having a single point of entry/exit only exacerbates an already tenuous and dangerous situation. Given the propensity of both interior and perimeter homes to ignite during a wildfire, excessive evacuation times, and single evacuation route, the potential for catastrophic losses cannot be overlooked. O3c-24

Compounding the community emergency response and overall risk is the applicant's request that the County approve a modification of the dead end road length rules in County Fire Code section 503.1.3. Again, the request is being made because of the alleged constraints due to topography, geology, and environmental conditions that make this infeasible (although the request appears to also be driven by a lack of agreement with landowners for access and easements). The standards of care regarding maximum dead end road lengths are established to ensure adequate opportunity for emergency vehicle access, turn around, and ease of evacuation. The fact that there are alleged conditions that may make meeting the existing regulations unattainable only emphasizes the unsuitability of this location because public safety and community protection cannot be assured. Ultimately, failure to secure secondary access results in significant Project-related impacts O3c-25

[20] Dudek 2017.

Response to Comment O3c-22

The comment quotes from the EIR and raises no issues with the analysis or conclusions. Please see the Global Responses to Adequacy of Emergency Evacuation and Access, particularly the section "Evacuation Scenarios were Analyzed."

Response to Comment O3c-23

The County disagrees with the comment's assertion that worst case evacuation conditions were not considered in the EIR. Please see the Global Response to Adequacy of Emergency Evacuation and Access, particularly the section "Evacuation Scenarios were Analyzed."

Response to Comment O3c-24

The County disagrees with the commenter's opinion that the Project has only a single point of access and that the road widening only occurs at the point of egress only. Please see the Global Response to Adequacy of Emergency Evacuation and Access, particularly the section "Evacuation Scenarios were Analyzed."

Response to Comment O3c-25

The County disagrees with the comment's opinion that the modification to dead end road length is based only on access and easement agreements or that it has not been adequately mitigated. The topography and environmental conditions that require a modification have all been taken into account in the design of Project roads proposed in lieu of meeting an 800-foot road length, which were subject to intensive review by County and fire staff. The site is constrained by a number of environmental factors that needed to be addressed during site design, the most notable of which is the pristine biological habitat in the southern portion of the Project. The terrain is often steep, with hills that do not allow for straight access routes. Given the terrain, on-site streets must curve in order to meet required grade and curve requirements. In addition, there are a number of open space areas (including landscaped swaths) in the Project site that were avoided in order to reduce visual effects. Finally, the Project was designed to avoid adding traffic to off-site streets south of the southern Project entrance. With respect to the comment that the Project has inadequately

	analyzed and addressed wildfire hazards and public safety, Section 3.1.3.2 of the FEIR concluded that the Project would not expose people or structures to a significant risk of loss, injury or death from wildland fires because the Project would comply with the FPP accepted by the Fire Authority Having Jurisdiction (FAHJ) and would be in compliance with the fire codes by including, as design features of the Project, the specifically developed measures and features detailed in Section 5.2.1.2 of the FPP. Please see the Global Response to Fire Hazards Impact Analysis, particularly the section "The Project Complies with the Fire Codes and Project is Consistent with the Recommendations Described in an Accepted FPP." Finally, as described in the Project's FPP and the Rohde & Associates report, there are multiple egress routes provided for the HGV South Project.

related to wildfire hazards and public safety the extent of which have been inadequately addressed and mitigated in the Fire Protection Plan and DEIR. O3c-25

It is worth repeating: the proposed modifications to currently acceptable standards related to dead end roads and evacuation routes have never been adequately tested or evaluated under real-world scenarios. The current standards exist for a reason and modifications should only be approved if it can be clearly demonstrated that they meet the intent of the code. The DEIR and the Plan provide no empirical evidence to demonstrate that the proposed measures provide the same or higher levels of community protection and safety during an emergency as the required secondary access. The following issues highlight the faulty assumptions made in asserting the mitigation measures meet or exceed existing code and should therefore be approved as meeting the intent of the code: O3c-26

- The third travel lane provides a widened road, but simply widening a road does not address issues where the only way to enter or exit the community is limited by unforeseen factors including fire impingement, vehicle collisions, etc. O3c-27
- While fuel management zones are an important aspect of community protection, the plan still fails to address fire embers and branding that enter the community during a wildfire O3c-28
- Current research has shown that ember resistant vents provide limited protection during a wildfire. Reducing the size of the mesh can simply cause the embers to burn down to a smaller size before entering the attic, and can still result in a structure ignition.[21] In fact, current ASTM standards for vents do not address the ability of these vents to completely exclude entry of flames of firebrands.[22] And while requiring 1/8th inch vents screening (rather than ¼ inch) seems to improve protection, no clear evidence suggests that this is the case, and has the problem of adding a maintenance burden on the homeowner (related to clogged vents, over spraying and clogging during painting, etc.).[23] O3c-29
- While increasing parking within the community may assist in minimizing potential obstructions and emergency vehicle access, it does not contribute to addressing the single access road issue. Furthermore, restricting parking may seem like a good idea, and while there may be requirements for single residence events over 10 persons to park off site and shuttle to the residence, a serious parking situation could occur when several homes (on a holiday for instance) all have up to nine visitors, and avoid parking mitigation measures yet still create a dangerous situation for emergency vehicle access and community evacuation. O3c-30
- Restricting landscaping adjacent to structures 1-3 feet away is another untested strategy to reduce risk. In fact, any vegetation adjacent to the home would still carry flame lengths sufficient to ignite the wall, particularly during a wind driven fire. O3c-31

[21] Manzello SL, Park SH, Suzuki S, Shields JR, Hayashi Y. Experimental investigation of structure vulnerabilities to firebrand showers. Fire Safety Journal 2011;46: 568-578.
[22] ASTM Standard E2886/E2886M – 14, 2014, "Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement," ASTM International, West Conshohocken, PA, 2014.
[23] Quarles, T. and TenWolde, A. 2004. Attic and Crawlspace Ventilation: Implications for homes located in the Urban-Wildland Interface. Woodframe Housing Durability and Disaster Issues Conference, Las Vegas, NV.

Response to Comment O3c-26

The County disagrees with the comment's opinion that the modification to dead end road length has not been adequately analyzed or mitigated. With regard to "real world scenarios," please refer to Response to Comment O3c-6. Please also see the Global Response to Fire Hazards Impact Analysis, particularly the section "The Project Complies with the Fire Codes and Project is Consistent with the Recommendations Described in an Accepted FPP".

Response to Comment O3c-27

Please see the Global Response to Fire Hazards Impact Analysis, particularly the section "The Project Complies with the Fire codes and Project is Consistent with the Recommendations Described in an accepted FPP" as well as Global Responses to Adequacy of Emergency Evacuation and Access, particularly the section "Evacuation Scenarios Were Analyzed." Note that a contingency plan would be available if it was considered unsafe to evacuate.

Response to Comment O3c-28

Please refer to responses provided to comments in Sections 3.0 and 3.1 of this letter, as well as Global Response to Fire Hazards Impact Analysis for more information on the EIR's analysis of fire embers/brands.

Response to Comment O3c-29

The County disagrees with the commenter's suggestion that ember-resistant vents, designed and tested to exclude embers, provide limited protection during a wildfire. The comment focuses on mesh opening size, but neglects to consider the type of vents that are being required at HGV South, which are vents that rely on configuration, not mesh size, to exclude embers.

Response to Comment O3c-30

The proposed modification to dead-end road length is expressly addressed in Global Response to Fire Hazards Impact Analysis under the heading "The Project Complies with the Fire Codes and Project is Consistent with the Recommendations Described in an Accepted FPP." The County disagrees with the commenter's statement that a parking plan and enforcement within HGV South would not contribute to successful evacuations. In addition to keeping

	lanes unobstructed for evacuation events, it also provides for faster response during medical or other emergencies within the community. Parking enforcement would occur at all times. The comment's statement on illegal holiday parking is speculative and therefore, does not require additional response. **Response to Comment O3c-31** The County disagrees with the commenter's opinion that restricting landscaping within 3 feet of the structures in unproven. Vegetation and flammable materials within 3 feet of structures has been observed during after-fire assessments to result in ignitions through the weep screed. Therefore, providing this restriction directly reduces the possibility that flame impinges through the weep screed and into the home.

- Structure spacing and density is widely recognized and a critical component in WUI fires, influencing how firefighters can respond. Community design can significantly reduce effectiveness and their ability to respond quickly to stop fire spread in a community. As with so many protection plans, no empirical evidence or evaluation is provided to address defensibility from structure to structure fire spread, or defensibility from dangerous topographic configurations. Further, the DEIR and Fire Protection Plan provide no clear evaluation or analysis to identify exposure and structure vulnerabilities, including an assessment for high and low fire and ember exposure risk, nor are the fuel treatment standards assessed to quantify exposure reduction for different topographical and weather conditions. O3c-32

3.3 Shelter in Place

Recognizing that there may be serious deficiencies in ingress/egress during an emergency, the planning documents for Harmony Grove discuss a "shelter in place" philosophy for the community. In fact, the Wildfire Risk Analysis states that the shelter in place requirement is "derived primarily from either high intensity wildfire threats to escape routes, or the rapid onset of high intensity wildfire which denies civilians an opportunity for escape." O3c-33

While this is seen as a last resort option, confusingly the community is not seeking an official shelter in place status. Arguably, the standards for obtaining this status are significant, and likely are triggered when there is no other option available to the community. However, as a newly planned community, appropriate evacuation options should be designed into the project. The community center building is proposed as an evacuation center, yet again the Plan and DEIR acknowledge that is it not actually "planned as an evacuation center."[24] While this may seem to be a suitable option, the risk that the facility, like all others within HGVS, may ignite due to fire brands or ignition by adjacent structures is not adequately addressed. O3c-34

Shelter in place is not only a dangerous strategy, it has a long history of catastrophic failures and can be terribly tragic. In 2009, wildfires in Australia cost the lives of 173 individuals who chose to stay in the community rather than evacuate. The results of a review by the Royal Commission asserted that abandoning the philosophy entirely is not appropriate, yet the policy should not apply in severe fire conditions, stating that leaving early is still the safest option, and there needs to be an emphasis on education and qualifications for those that stay behind.[25] O3c-35

In contrast, the DEIR emphasizes a shelter in place scenario during the most extreme conditions. While we refer to this philosophy as "shelter-in-place" in California, communities like those in Australia use the "Stay and Defend" terminology. A significant distinction between these two philosophies highlights the challenges in adopting and promoting this community protection standard. Unlike shelter-in-place, stay-and-defend connotes residents actively patrolling the community, putting out small spot fires, keeping rooftops and vegetation wet, and potentially combating actual fires. The issue is that O3c-36

[24] Dudek 2017. Pg. 39.
[25] http://www.nfpa.org/news-and-research/publications/nfpa-journal/2011/september-2011/features/stay-or-go

Response to Comment O3c-32

The County disagrees with the commenter's assertion that fire spread and embers have not been adequately analyzed and mitigated. Please refer to responses provided to comments in Section 3.0 and 3.1 of this letter as well as Global Response to Fire Hazards Impact Analysis for more information on the EIR's analysis of fire embers/brands. Further, regarding structure spacing and density, the same ignition-resistant features provided for wildfire protection provide a level of fire protection from neighboring structures. The close proximity of fire response resources combined with the ignition-resistive exteriors and interior sprinklers that are very successful controlling or extinguishing interior fires will assist to provide adequate protection from structure-to-structure fires.

Response to Comment O3c-33

The County acknowledges the comment and disagrees with its suggestion that the Project's ability to temporary refuge firefighters and citizens is based on recognition of serious deficiencies in ingress/egress. The Project, like any new master planned development in southern California, would enable emergency responders/decision makers to utilize some form of temporarily refuging firefighters and (as a last resort) residents, on site during wildfire emergencies. It is worth noting that the only "shelter in place" communities, which HGV South has been modeled after, within the RSFFPD, do not rely solely on shelter-in-place; just as HGV South does not solely rely on shelter-in-place. The RSFFPD has required a very high level of ignition resistance and fuel modification that is consistent with what will be provided at the HGV South site. Also, even in The Crosby, Cielo and other shelter-in-place communities, the first and preferred priority is early evacuation. During the 2007 Witch Creek Fire, RSFFPD evacuated residents of The Crosby and Cielo and did so early, several hours before fire approached the community. Temporarily refuging on site should be considered as a contingency solution for instances when an early evacuation is not possible. Fire officials recognize that sheltering in an ignition-resistant community, like The Crosby or HGV South, is safer than a late evacuation.

Response to Comment O3c-34

Please refer to Response to Comment O3c-33 regarding the temporary refuge option that is available at HGV South. Please see the Global Responses to Adequacy of Emergency Evacuation and Access for more details regarding the planned approach. Further, the County has determined the analysis of the evacuation options and the Project's clubhouse, which can provide temporary refuge during an emergency, to meet the industry standards. Please refer to responses provided to comments in Section 3.0 and 3.1 of this letter for details of the Project's considerable analysis of embers and their potential at the HGV South site and how the Project addresses embers for the site's structures and landscape.

Response to Comment O3c-35

The commenter compares the concept of sheltering in place with the "Leave Early or Stay and Defend" (LEOSAD) model that was at one time promoted in Australia. The two concepts are completely different as are the building requirements between San Diego County and Australia. The Australian strategy of "stay and defend" differs from the "temporary refuge" strategy. "Stay and defend" is an active process where individuals who decide to remain at home during a wildfire actively implement fire protection measures before, during, and following a wildfire. The proposed temporary refuge strategy emphasizes early evacuation, if evacuation can be done safely. Only if early evacuation is not possible would the temporary refuge strategy be implemented.

As described by Dr. Chris Dicus (Professor, Cal Poly San Luis Obispo) in his 2010 presentation to the California Fire Prevention Officers Institute, the concept of LEOSAD is very different from what is proposed for HGV South. Dr. Dicus was in Melbourne, Australia, before, during, and after the 2009 Victorian wildfires. Based on information in his presentation "Fire Down Under – The Good, the Bad, and the Downright Tragic," and communication during the question/answer session with Mr. Michael Huff of Dudek who prepared the Project FPP, the damage and loss from the Australian wildfires cannot be compared to wildfire risks for the Project site for several reasons.

	Some of the homes that were destroyed in the Victorian fire were located in eucalyptus forest and were not protected with defensible space (fuel modification zones). Some homes were not constructed with ignition-resistant materials. In addition, many residents ignored the evacuation warning given 24 hours before the wildfire began. In contrast, the Project will provide substantial fuel modification zones throughout the Project site. New structures will be built with ignition-resistant materials and the site will be regularly inspected by RSFFPD. The emergency procedures for the Project require the early evacuation of residents as the primary option during a wildfire emergency. If safe relocation is not possible, the residents may be directed to temporarily refuge on-site in their homes or at the clubhouse, both of which will be designed to the latest ignition-resistant standards. For a description of other protective features, please see the FPP, Appendix L of the EIR. **Response to Comment O3c-36** Please refer to Response to Comment O3c-35. The commenter fails to acknowledge the difference between all aspects of the Australian communities and that of HGV South and other San Diego County developments with regard to contrasts between fuel types, building and construction standards, landscape fuel modification standards, enforced maintenance, and inspections.

residents lack the proper training, equipment, and resources necessary, giving a false sense of security and faulty assumption that homeowners are as capable as firefighters. Another key distinction is that a shelter-in-place strategy may place residents at risk if (for instance) entry by first responders into the community is cut off or significantly delayed. In that scenario, homes are then at risk for catching on fire and having fire spread throughout the community as the homes have been largely left unprotected and un-monitored. O3c-36

The simple fact that this Project is even contemplating a shelter-in-place option (due to threats along evacuation routes among other factors) only serves to highlight the risk to the proposed Project area and the existing community; it is an acknowledgement that evacuation may not only be infeasible, but impractical in certain (unspecified) conditions. Given the propensity for fire branding and the spread of fire within the community, shelter-in-place is even more worrisome. Additionally, current research on smoke exposure and the significant health risks associated with fires within the WUI places residents in a serious situation where the short term benefits of sheltering in place are potentially outweighed by the long-term risks associated with cancer, respiratory, and cardiac issues. Those engulfed in WUI fires are exposed to unsafe levels of high-risk contaminants including trace metals, polycyclic aromatic hydrocarbons (PAHs), benzene, carbon monoxide (CO), nitrogen and sulfur oxides, cyanide, volatile organic compounds (VOCs), airborne acids, and particulates. When extreme physiological conditions exist in an environment where ambient heat, smoke, and high-risk exposures are commonplace, a WUI fire can exceed the limits of what the human body should withstand. The DEIR fails to evaluate these impacts. O3c-37

Furthermore, under this plan, the DEIR and the Wildfire Risk Analysis acknowledge that extreme wildfire events may require those who shelter in place to "reposition" themselves during an incident to avoid radiant heat.[26] Not only are individuals in this scenario not adequately prepared to protect themselves from the threats of radiant heat (among other risks), but they are also being asked to know when to move and respond to changing circumstances and safely navigate what is arguably one of the most intense and risky environments on the planet. This is a dangerous strategy and a substantial expectation of residents that could have extreme consequences on the health and welfare of the community. O3c-38

4.0 The Future of Wildfires

4.1 Climate Change

There is consensus within the scientific community that climate change will generally increase fire risk due to its effects on fuel loads and weather,[27] and in fact we have seen a dramatic shift in the frequency and intensity of wildfires throughout North America. Shifting climatic conditions and land use change are combining to produce more frequent O3c-39

[26] Rhode and Associates 2016, Pg 16.
[27] Moritz, M.A. and S.L. Stephens. 2008. Fire and sustainability: Considerations for California's altered future climate. Climatic Change (2008) 87 (Suppl 1): S265–S271

Response to Comment O3c-37

The comment is speculative. There is no information regarding amount or type of smoke, length of exposure, etc. that can be tied to a specific future fire event. Regardless, please refer to previous responses to comments regarding the Project's temporary refuge contingency option. Should this contingency option be enacted by responding law enforcement and emergency personnel, it would be for a short period of time as a wildfire burned through the native vegetation beyond the Project's fuel modification zones. The typical wildfire through fuel types found near the Project would be 30 minutes or less. Even if the burn time were longer, the residents would remain in their homes or the clubhouse, which would limit their exposure to smoke and contaminants listed in the comment. The availability of open air sheltering (parkland) is not relied upon for the Project's evacuation or contingency. The open air refuge would be appropriate for firefighters and as a last resort for motorists and large animal trailers. There is no intention of temporarily refuging HGV South residents in the open air where they would be exposed to smoke conditions except as a tertiary contingency option. In this scenario, those seeking refuge would remain in their vehicles with windows rolled up, limiting their exposure to smoke. The EIR's analysis is considered adequate and no further response is required or necessary.

Response to Comment O3c-38

The County acknowledges the EIR/Wildfire Risk Analysis contemplation of sheltering individuals possibly needing to reposition themselves if sheltering in one of the off-site open field or park areas. The Project intends to temporarily refuge only when it is unsafe to evacuate and the refuge will occur within homes and/or the clubhouse. The areas mentioned in the Wildfire Risk Analysis report would be tertiary sheltering sites for anyone who may be attempting a late evacuation and needing to seek a safe space or for existing residents who may have large animals and trailers. The County anticipates the open air sheltering would be appropriate for trained firefighters and as a last resort for motorists. The repositioning mentioned in the Wildfire Risk Analysis refers to the possibility that off-site fuels ignite and create heat. Repositioning would mean

moving away from the heat source, but remaining within the large park and within vehicles.

The EIR analysis is considered sufficient and no additional response is necessary or required.

Response to Comment O3c-39

The County acknowledges the comment and climate change projections it presents. However, it is speculation to attempt to determine the potential future fire impacts from climate change and to directly relate increased acreage burned to climate alone. By the end of this century, average temperature in California is expected to increase by 2.7°F to 8.1°F (1.5°C to 4.5°C) depending on many factors, including future carbon emissions (Cayan et al. 2008). Under projected future climate change scenarios, wildfire risk and the amount of area burned annually in California is predicted to increase (Lenihan et al. 2008; Westerling and Bryant 2008). Generally, it is presumed that if temperatures rise, vegetation communities will gradually shift elevations upward, with grasslands dominating larger areas. For example, grasslands are predicted to expand into woodlands and shrublands, which could further affect wildfire regimes (Lenihan et al. 2008), resulting in more frequent fires and perpetuation of the flashy-fuel dominated landscape. Models of fire damage in a changing climate predict an increase in wildfire-caused property damage in the WUI near major metropolitan areas, such as coastal southern California (Westerling and Bryant 2008). However, there is some uncertainty about future fire regimes in southern California as increasing aridity and higher temperatures could reduce availability of fine fuels, which could lower fire frequency and the conversion of heavier fuels to lighter fuels could result in less intense fires and a reduction in wildfire-caused property damage, especially given the ever-improving ignition-resistant building codes. It is also unclear whether Santa Ana winds might be altered in a warming climate. Because of the speculative nature of projecting future conditions and the potential possibility that fire risk is reduced through vegetation type conversions, the FPP analysis of worst-case conditions is considered valid and no additional analysis is required or necessary.

and intense wildfires while also expanding the overall annual wildfire season.[28] California is considered a climate change hotspot likely to experience higher than average impacts when compared to the rest of the United States.[29] In fact, we may already be seeing these effects. Compounding this risk is the prediction that large fires (defined as 500 acres or more) will increase nearly 35% by 2050, and an alarming 55% by the end of the century.[30] If our population expands into and increases the WUI, there is a concomitant increase in the probability of property losses due to wildfires. All of these high risk factors describe the HGVS Project. O3c-39

4.1.1 Temperature Changes

Climate change has broad implications for wildfires, spanning both the physical and natural environment. Recent research suggests that regional temperatures in California may increase from 1.7 C to 5.8 C by 2100, depending on the climate model used and the emissions scenarios assumed.[31] This of course leads to an increase in the number of days of high or extreme fire risk (as assessed by CAL FIRE in their daily wildfire risk warning system). In fact, recent research suggests that the fire seasons are already longer than they were historically.[32] O3c-40

4.1.2 Changes in Wind

As identified in the Plan, fires in the area were historically wind driven. In the modeling of the planning area, winds were calculated at variable speeds up to 50 mph. Ultimately the fire season is predicted to become longer in California, with predicted increases in the number of Santa Ana wind days under future climate scenarios.[33] Therefore, wind driven fires are predicted to change in the future. Wind modeling can assist fire managers in estimating local wind patterns and the potential for wind-based increases in fire spread rate and intensity.[34] Recurrent wind patterns, such as those that arise during Santa Ana wind events, can be modeled to help identify local areas that have high potential for Santa Ana wind-based increases in fire spread and intensity. Unfortunately, the limited analysis performed to evaluate this Project introduces considerable uncertainty into efficacy of the mitigation measures and the Fire Protection Plan. O3c-41

The ability to model fire intensity spread is of utmost importance in planning. However, the planning process is only as good as the modeling used and the availability of suitable data. Without this, creating hazard maps and identifying indefensible areas is problematic. Given what we know about wind modeling and the lack of empirical data for the HGVS planning area, there are inherent problems for developing an effective fire plan for the HGVS project. The lack of data can lead to a serious misrepresentation and underestimation of onsite conditions, wind events, temperature, and fuel moisture. Planning done under this scenario can lead to an inaccurate model that does not truly represent onsite conditions. When it O3c-42

[28] A.L. Westerling, H.G. Hidalgo, D.R. Cayan, and T.W. Swetnam, *Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity*, 313 Science 940 (2006).
[29] Diffenbaugh, N. S., F. Giorgi, & J.S. Pal (2008). Climate change hotspots in the United States. Geophys. Res. Lett. 35: L16709.
[30] Westerling, A. et al. 2006. Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity, 313 Science 940.
[31] D. Cayan, A. L. Luers, M. Hanemann, G. Franco, and B. Croes, *Scenario of Climate Change in California: Overview*, CEC-500-2005-186-SF (2006).
[32] *Id.*
[33] Running, S.W., 2006. Is Global Warming Causing More, Larger Wildfires? Science 313: 927-928.
[34] Butler, B.W., M. Finney, L. Bradshaw, J. Forthofer, C. McHugh, R. Stratton, and D. Jimenez. 2006. WindWizard: A new tool for fire management decision support. USDA Forest Service Proceedings RMRS-P-41.

Response to Comment O3c-40

Please refer to the Project's EIR and to Response to Comment O3c-39 for more information regarding climate change and its potential effects on wildfire risk, and corresponding conclusion on the EIR's analysis adequacy.

Response to Comment O3c-41

The County agrees with the commenter's statements that Santa Ana winds can affect fire spread rates and intensities. However, the County disagrees with the commenter's suggestions that the fire behavior modeling conducted by Dudek and Rohde & Associates is limited or introduces uncertainty of the mitigation measure efficacy. The Project's fire behavior analysis was performed according to industry standards and then re-analyzed with FlamMap and LANDFIRE applications. This level of analysis exceeds County standards and provides a reliable estimation of typical and worst-case fire conditions, including during Santa Ana wind events. Attempting to predict future changes in wind events is speculative and not required by CEQA. Therefore, no additional analysis is required or necessary.

Response to Comment O3c-42

Please refer to Response to Comment O3c-2. Modeling worst-case fire behavior near the Project is the best way to determine how fires are expected to respond given fuels, terrain, and weather. Beyond the modeling efforts, fire events that have occurred in the area are analyzed in order to gain a more regional view, as well as to predict specific on-site effects, and to confirm models are consistent. To that end, knowing how a fire behaves based on data obtained from like areas, similar fuels, etc. is considered critical for determining appropriate fuel modification zone setbacks, appropriate ignition-resistant construction features, and where additional measures may be necessary. The County disagrees that there was a lack of data or that modeling inputs were not accurate and conservative (i.e., allowed for appropriate estimate of uncertainty). The modeling was performed according to County and industry standards and does not require additional analysis.

Response to Comment O3c-43

Please refer to Response to Comment O3c-39 for information regarding the speculative nature of attempting to predict future climate conditions, which would include precipitation conditions. Please note that it can be argued that if the commenter is correct and precipitation is reduced, certain vegetation types will not be sustainable, converting to a grassland with potentially more fires, but of much lower, controllable intensity.

Response to Comment O3c-44

The County acknowledges that climate change may result in future fuel conditions that are different than today. However, as indicated in Responses to Comments O3c-39 and O3c-41, it is speculative to assume how climate change may impact native vegetation areas and whether it will result in a more or less risky condition. Regardless, the approach to fire protection being applied to the HGV South Project considers a worst-case condition at the outer perimeter of the Project. The vegetation throughout the Project's landscape and its perimeter fuel modification zones can be predicted with a high degree of accuracy since it will be a managed, maintained space. Based on the requirements for the fuel modification zones and landscape space throughout the Project, wildfire within these areas will be minimal as the fuels will not support/facilitate fire ignition or spread. Changes in the vegetation beyond the maintained areas, within the open space preserve areas, may occur, and may include the establishment of species that are not presently there. Because the open space would be managed for habitat continuity and function, however, substantial changes are not considered likely in the foreseeable future, and are speculative in any event. Because such conditions are currently speculative, modeling of unknown future conditions is not required.

Response to Comment O3c-45

Please refer to Responses to Comments O3c-39 through O3c-44 for information and approach regarding the fire behavior of existing vs future conditions. Specifically with regard to non-native grasses cited in the comments, however, if the commenter's climate change scenario occurs, it is likely that the non-native species will be grasses, herbs and forbs or other weedy species that can

	survive with reduced moisture that also include reduced fire behavior from that modeled.

Climate change is also likely to augment the spread of invasive species, which is already occurring in the planning area and surrounding habitat. This can occur when the normal disturbance regimes under which the native community evolved are altered. Throughout the western United States, we have witnessed the spread of invasive species, particularly grasses, which change the fire frequency and intensity and shorten the return interval of fires. This results in a feedback loop where wildfires advance the spread of invasive species, ultimately leading to a type-conversion of the habitat to a nonnative dominated ecosystem.[43,44] Therefore, what was modeled in the DEIR and supporting documents was not the worst-case scenario, but one based largely on existing conditions. O3c-46

In sum, the DEIR relies on a faulty model which yields a faulty analysis and inadequate mitigation. O3c-47

4.2 Changes in the Causes of Wildfires

While historic fires were generally recorded under wind events, future fires will likely not be exclusively wind driven. Given recent trends and possible changes due to a myriad of interrelated factors such as climate change, succession, and invasive species, there may be a concomitant increase in both human-caused fire events and lightning-caused wildfires. These scenarios are not addressed in the DEIR or the Plan. For example, human-caused ignition events are predicted to increase with population.[45] This is exacerbated by the prediction that there will also be an increase in the frequency of lightning as a result of climate change.[46] This, of course, has direct implications for the risk of wildfires that we are already experiencing. O3c-48

In 2008, over 2,000 wildfires were started by over 6,000 dry-lightning strikes in Northern California. The record number of lightning strikes and extreme drought conditions created catastrophic conditions that burned nearly 1.2 million acres, destroyed over 500 structures, and killed 15 people.[47] It is assumed that climate change is stimulating this change, and may bring lightning-caused fires to areas in quantities never seen in recorded history.[48] Adding additional homes to an already burdened fire district adds the potential for an increase in human-caused fire events. It should be noted that this is not just in reference to arson. Most wildfires today are the cause of human negligence or accidents from vehicles, heavy equipment, lawn care equipment, etc. O3c-49

[43] Klinger, R. C., M. L. Brooks, and J. M. Randall, Fire and Invasive Plant Species, in Sugihara, N. G., J. W. van Wagtendonk, K. E. Shaffer, J. Fites-Kaufman, and A. E. Thode (eds). 2006. Fire in California's Ecosystems. University of California Press.
[44] Harrison, S., B.D. Inouye, and H.D. Safford. 2003. Ecological heterogeneity in the effects of grazing and fire on grassland diversity. Conservation Biology 17:837-845.
[45] Syphard, A., V. Radeloff, J. Keeley, T. Hawbaker, M. Clayton, S. Stewart, and R. Hammer. 2007. "Human influence on California fire regimes." Ecological Applications 17:1388– 1402.
[46] Price, C., 2008. Thunderstorms, Lightning and Climate Change. in Lightning - Principles, Instruments and Applications, ed. H.D. Betz, Springer Publications.
[47] http://www.fire.ca.gov/index_incidents_overview.php
[48] http://www.usnews.com/science/articles/2010/04/21/an-arctic-with-fire.html

Response to Comment O3c-46

The County disagrees with the commenter's opinion that the EIR's fire behavior modeling did not model the worst-case condition. The County agrees that if a future condition includes conversion to non-native grasses, which is already the case for much of the Project site, there may be a higher fire frequency. However, the fire intensity would be reduced, therefore not representing a worst-case condition. Please refer to Responses to Comments O3c-39 through O3c-44 for information and approach regarding the fire behavior of existing vs future conditions.

Response to Comment O3c-47

The County disagrees with the assertion that the EIR relies on a faulty model and analysis for mitigation measures, as described in the preceding responses to Section 4.1 of this letter.

Response to Comment O3c-48

Please refer to Responses to Comments O3c-39 through O3c-44 for information and approach regarding the existing vs future conditions. Further, while it is true that humans are the cause of most fires in California and throughout the United States, no available data link increases in wildfires with the development of ignition-resistant, fire-aware communities. Likewise, lighting-caused fires are associated primarily with forested areas where vertical, flammable objects may be more prone to strikes. Lightning-caused fires typically become wildfires because they occur in remote areas where detection and suppression are delayed. That would not be the case in the vicinity of HGV South as fires that start in the Harmony Grove Valley are quickly detected due to the developed areas throughout the valley.

Response to Comment O3c-49

The County disagrees with the commenter's comparison of northern California lighting strikes with future conditions in southern California and provides no evidence regarding southern California conditions. In any event, please refer to Responses to Comments O3c-39 through O3c-44 and Response to Comment O3c-48 for information and approach regarding the fire behavior of existing versus future conditions.

5.0 Conclusion

Wildfires are a predictable occurrence, and will happen again. Even with best practices and mitigation measures, wildfire hazard risk to the proposed HGVS development and to existing and future residents in the area would be significant. In fact, there is a high likelihood that the community could suffer catastrophic losses to structures, infrastructure, and poses a considerable risk to public safety, community resilience, and the safety of first responders. Like most of southern California, wildfire events that threaten HGVS can occur under the most adverse environmental conditions, and (if recent fire history is a guide) can likely occur during times of a regional fire siege of multiple large fires. Under an extreme (yet all too common) fire siege, the number of first responders and resources required to be assigned for adequate structure defense at HGVS may be deficient. While mitigating the need for resource deployment is a laudable goal, the extreme risk to this proposed community and the surrounding area is undeniable, and places a significant burden on area residents, forcing them to make critical decisions (without adequate training) that can be consequential to their safety and survival during a wildfire.

The analysis of fire risks and mitigation measures for the Project is based on faulty modeling, which led to a faulty analysis and unsubstantiated conclusions and recommendations. No clear evidence is provided that a secondary access is infeasible or that the proposed measures are a superior option. This is not how communities should be planned today – it was how we did it things in the past, and we saw the catastrophic results of those bad decisions. Rolling back our planning process and standards for this Project is not justified.

O3c-50

It is alarming to see that the solution to a regional fire siege threat is to rely on untested strategies designed to reduce the need for resource deployment for structural defense, while also ignoring many of the time tested measures that are known to provide adequate protection (e.g. multiple access roads and dead-end road standards). Despite the assertion throughout the DEIR and supporting documents that the Project design and proposed mitigation measures will provide adequate community protection, the DEIR provides no evidence to support this conclusion. With no significant empirical evidence to support the effectiveness of the proposed measures, the Project will regrettably become an experimental community, designed to test whether certain features can improve community resilience and public safety. The consequences of this approach could be tragic.

The County has a responsibility to be prospective and protective in its planning decisions, particularly when they involve high fire risk areas like the Project site. The Project should include an adaptive management framework that provides for the flexibility to anticipate issues such as changes in extreme climate conditions and heightened wildfire risk (at a level informed by the best available science). While, advancements in our understanding of fire risks lag behind community planning and risk assessment needs, this is no excuse for placing a community in a high risk area with inadequate and untested protection measures. A lack of critical information and understanding in this area creates a situation in which pivotal land use decisions are made based on such malleable factors as public perception or budgetary constraints.

Response to Comment O3c-50

The County acknowledges the comment and notes that it provides concluding remarks that do not raise new or additional environmental issues concerning the adequacy of the EIR. Please refer to previous responses provided to comments in Sections: Cover Letter, and Sections 1.0 through 4.0 of the letter correlating with this response, with particular attention to Responses to Comments O3-24 through O3-49. For these reasons, the County provides no further response to this comment.

Regardless of analysis used or the models evaluated, it must be remembered that these are simply tools that are meant to provide information to assist in making an informed decision. We must remember that these tools are fraught with considerable uncertainty. Ultimately, the decision to approve a development is based on the level of risk that we are willing to accept for a community. Ideally, decision-makers should operate under the precautionary principle that states: "When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically."[49] Failure to adhere to a "caution is best" approach can have serious repercussions on the long-term sustainability and resilience of our neighborhoods and the success or failure of community planning.

O3c-50

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[49] The most widely cited definition of the precautionary principle comes from the Wingspread Statement on the Precautionary Principle, 1998.