Appendix 1
General Development Plan

Thompson Holdings, LLC, 2005
Paraiso Springs General Development Plan

Owner:

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Paraiso Springs General Development Plan

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Section 1

General Development Plan
PARAISO SPRINGS RESORT

Project Description

Paraiso Hot Springs Resort is located in Monterey County, eight miles southwest of the town of Soledad. The resort is located at an elevation of approximately 1200 feet overlooking the Salinas Valley. The property is situated on 240 acres, with approximately 90 acres of area for the spa/resort development, and the remainder of the site to be retained in open space, hiking trails, habitat and landform preservation, and landscaping improvements.

Access to the spa/resort is provided via Paraiso Springs Road from Clark Road or River Road with direct access from either Route 68 or Highway 101.

The Paraiso site is owned by Thompson Holdings, LLC. The property is divided into three lots of record that are included in the following Assessor’s Parcel Numbers: 418-361-004, 418-381-022, 418-381-021. The area currently developed and those areas to be redeveloped are zoned Commercial-Visitor Serving.

Land Uses

Resort

The Paraiso Spa/Resort will be one of the premier properties in all of California. Paraiso will provide both overnight and day guest with a tranquil landscaped environment by which the visitor can enjoy the beautiful surroundings of the property and Salinas valley. The spa/resort will bring to California unique wellness treatments only found in the finest spas in Europe. In combination with the wellness treatments Paraiso will provide an extensive educational component, fitness program and culinary experience that promises to be a valued enhancement to the surrounding community. The spa/resort is envisioned to consist of a series of single and two-story clustered visitor-servicing hotel units, timeshare units, timeshare villas and common visitor areas. A total of 103 hotel units, 60 2/3 bedroom timeshare units and 17 timeshare villas are planned in addition to a variety of resort amenities that comprise Paraiso Springs Spa/Resort.

The redevelopment of Paraiso will be constructed, where feasible, with green building materials. Sustainability practices will be adopted in all facets of the project from design to construction and operation of the spa/resort. The resort/spa has been designed to provide both a public access part of the resort via a Hamlet and a secluded part of the resort for hotel guests. The public will be provided access to the historic springs through the use of the day spa located within the hamlet. The landscaping of the property will make use of man made ponds and waterfalls. Trails will also be incorporated throughout the site. The guest units will be strategically placed on the site to provide a sense of privacy for the guests and also to preserve views from the guest quarters of the Paraiso property and the Salinas Valley below. The hotel units are designed so that they may be clustered in groups of two/four units, or as a detached single unit. The timeshare-hotel units are proposed to be larger units which will include small kitchens, a small dining nook, a living room and two/three bedroom suites, complete with baths for each bedroom. The timeshare-villas are larger units that provide family style living for the guest.

The Paraiso General Development Plan was developed after a detailed review of the Central Salinas Valley Area Plan and its associated EIR for the Paraiso Hot Springs Property. The Central Salinas Valley Area Plan policy number 28.1.1.1 designates specific land uses for the Paraiso Hot Springs Property specifically "The resort may include such uses as a lodge, individual cottages, visitor center, recreational vehicle accommodations, restaurants, shops, stables, tennis courts, aquaculture, mineral water bottling, hiking trails, vineyards and orchards".

Thompson Holdings, LLC
Recreation

Second only to the spectacular foothills setting of the Paraiso Springs Resort, the natural mineral springs of the property are the preeminent assets of Paraiso and are responsible for the original development of the site in the 1800’s. The existing hot springs will be used in both existing and new water features. A Spa Center is proposed which will offer massage, beauty and therapeutic services. A Wellness/Education Center is proposed which will offer lectures by some of the top wellness professionals from around the world. Conference facilities are proposed which will offer seminars, small group and meeting space. An outdoor/indoor fitness center is proposed which will integrate outdoor activities with indoor physical wellness and training facilities. A cultural center for the arts is proposed which will offer music, art and literature.

Restaurants

Three restaurants are proposed, featuring organic foods and wine. The restaurants will provide both dining facilities for the general public and hotel guests. A garden and greenhouse are proposed to be located near the restaurant(s), offering herbs and produce grown on the resort property. A culinary training school is also proposed.

Site Amenities

An outdoor amphitheater is proposed for various uses by the hotel guests. Vineyards and a wine pavilion for hotel guest functions are contemplated near the entrance to the resort. Laundry and maintenance facilities are also proposed on site.

Parking

Parking is proposed for both overnight and day guests. The total number of parking spaces is 310 spaces.

Landscaping

The proposed amenities will be located to be surrounded by man made ponds and waterfalls to promote a sense of tranquility. The use of many trees (both existing and new plantings) will be incorporated into the project to promote a feeling of privacy. Paths are proposed throughout the site to provide easy accessibility for guests.

Site Summary

The property is located on 240 acres of mountain and foothill terrain. The proposed development area will encompass approximately 90 acres, with a focus on 50 acres or 21% of the total property. A total of 103 hotel units, 60 timeshare units and 17 timeshare villas with support facilities are proposed. The following will serve as a reference table, with functional descriptions of the space/feature, keyed directly to the master site plan and drawings contained within the application. The table also indicates if the facility/feature is available to the public (day guest and overnight guest access), private (access to overnight guest only) or is a support facility only accessible by spa/resort staff.
<table>
<thead>
<tr>
<th>Site Plan #</th>
<th>Feature</th>
<th>Description</th>
<th>Private/Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Main Entry Roadway</td>
<td>Road leading to Spa/Resort</td>
<td>Public (access to day and overnight guests)</td>
</tr>
<tr>
<td>2</td>
<td>Hotel Spa Entry Gateway</td>
<td>Gate House for overnight guests</td>
<td>Private (available to overnight guests only)</td>
</tr>
<tr>
<td>3</td>
<td>Existing specimen oaks</td>
<td>Typical oaks on property</td>
<td>N/A</td>
</tr>
<tr>
<td>4</td>
<td>Estate Lots Drive</td>
<td>Road leading to Timeshare Villas</td>
<td>Private</td>
</tr>
<tr>
<td>5</td>
<td>Estate Lots Drive – 1/3 acre</td>
<td>Timeshare Villas</td>
<td>Private</td>
</tr>
<tr>
<td>6</td>
<td>Vineyards</td>
<td>Vineyards for the production of house wine</td>
<td>Public</td>
</tr>
<tr>
<td>7</td>
<td>Hotel and Spa Entry Drive</td>
<td>Road leading to guest check registration</td>
<td>Private</td>
</tr>
<tr>
<td>8</td>
<td>Paraiso Institute</td>
<td>Educational classes for guests on health and wellness</td>
<td>Private</td>
</tr>
<tr>
<td>9</td>
<td>Themed Stone Bridge</td>
<td>Feature for guest arrival</td>
<td>Private</td>
</tr>
<tr>
<td>10</td>
<td>Nursery Center and Display Gardens</td>
<td>Organic gardens where flowers, fruits, vegetables and herbs will be grown for resale or use by the spa/resort</td>
<td>Public</td>
</tr>
<tr>
<td>11</td>
<td>Wine Pavilion</td>
<td>Private conference center for special events</td>
<td>Private</td>
</tr>
<tr>
<td>12</td>
<td>Hamlet Entry Drive</td>
<td>Road leading to the hamlet</td>
<td>Public</td>
</tr>
<tr>
<td>13</td>
<td>Parking Meadow</td>
<td>Overflow parking for special events</td>
<td>Public</td>
</tr>
<tr>
<td>14</td>
<td>Visitors Center</td>
<td>Overflow parking area for the Hamlet guests</td>
<td>Public</td>
</tr>
<tr>
<td>15</td>
<td>Enhanced On-Site Treatment System</td>
<td>Waste treatment system and pump house for subsurface irrigation.</td>
<td>Public</td>
</tr>
<tr>
<td>16</td>
<td>Hamlet Arrival Plaza</td>
<td>Arrival plaza for the hamlet for day guests</td>
<td>Public</td>
</tr>
<tr>
<td>17</td>
<td>Hamlet Town Square</td>
<td>Main square of the hamlet where both overnight and day guests can enjoy various amenities (i.e. wine tasting, watch artist at work, shop or just enjoy a cup of tea from around the world)</td>
<td>Public</td>
</tr>
<tr>
<td>18</td>
<td>Amphitheater Lawn</td>
<td>The great lawn is the main seating area for specialty events</td>
<td>Private</td>
</tr>
<tr>
<td>19</td>
<td>Amphitheater Pavilion and Stage</td>
<td>Outdoor theater where specialty events will be held for hotel guests</td>
<td>Private</td>
</tr>
<tr>
<td>20</td>
<td>Day Spa Pools and Pavilions</td>
<td>Original Paraiso spring-featured pools where both day guests and overnight guests can enjoy the healing waters</td>
<td>Public</td>
</tr>
<tr>
<td>21</td>
<td>Hotel Guest Parking</td>
<td>Overnight guest parking</td>
<td>Private</td>
</tr>
<tr>
<td>22</td>
<td>Spa and Hotel Arrival Plaza</td>
<td>Arrival Plaza for the overnight hotel and spa guests</td>
<td>Private</td>
</tr>
<tr>
<td>23</td>
<td>Stone Pedestrian Arrival Bridge</td>
<td>Arrival feature for the overnight guest</td>
<td>Private</td>
</tr>
<tr>
<td>24</td>
<td>Re-circulating Ornamental Stream and Waterfalls</td>
<td>Water features</td>
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</tbody>
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## Master Plan Reference Table (Continued)

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
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<td>25</td>
<td>Guest Arrival Courtyard</td>
<td>Private</td>
</tr>
<tr>
<td>26</td>
<td>Hotel Pergola Gardens &amp; Overlook Terrace</td>
<td>Public</td>
</tr>
<tr>
<td>27</td>
<td>Activity Terrace with Croquet and Bocce Courts</td>
<td>Public</td>
</tr>
<tr>
<td>28</td>
<td>Conference Center Gardens and Terraces</td>
<td>Public</td>
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<tr>
<td>29</td>
<td>Guestroom Casitas</td>
<td>Private</td>
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<tr>
<td>30</td>
<td>Overnight Therapy Stream and Swimming Pool</td>
<td>Private</td>
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<td>31</td>
<td>Service Drive</td>
<td>Staff Only</td>
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<td>32</td>
<td>Hamlet Parking</td>
<td>Public</td>
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<td>33</td>
<td>Service Cart Path</td>
<td>Staff Only</td>
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<tr>
<td>34</td>
<td>Housekeeping, Laundry, Mechanical</td>
<td>Staff Only</td>
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<td>35</td>
<td>Spa Entry Courtyard Gardens</td>
<td>Private</td>
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<td>36</td>
<td>Teahouse</td>
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<td>37</td>
<td>Spa Water Gardens</td>
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<td>38</td>
<td>Spa Courtyard Garden (typical)</td>
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<td>39</td>
<td>Labyrinth</td>
<td>Private</td>
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<td>40</td>
<td>Pedestrian Bridge to Spa Activity Center</td>
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<td>41</td>
<td>Lap Pool</td>
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<td>42</td>
<td>Vitality Pavilions</td>
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<td>43</td>
<td>Vitality Courtyard Garden</td>
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<td>44</td>
<td>Golf School</td>
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<td>45</td>
<td>Practice Putting Greens</td>
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<td>46</td>
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<td>47</td>
<td>Basketball Pavilion</td>
<td>Private</td>
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<td>48</td>
<td>Pathway to Hiking Center, Trailheads, and Naturist Area</td>
<td>Private</td>
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<td>49</td>
<td>Hillside Village Timeshare</td>
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<td>50</td>
<td>Streamside Pathway</td>
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<td>Naturist Solarium Area</td>
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<td>52</td>
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<td>53</td>
<td>Trailside Overlook</td>
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Environmental Considerations

Historical/Archaeological Resources

An Archaeological and Historical report has been prepared by Archaeological Consulting Inc. and has been submitted to Monterey County Planning Department. In summary, the historical report identified several structures on the site of significant historical value that were demised and recommended mitigations to address the demolitions. The structures were demolished prior to the submittal of this application. The archaeological report identified two recorded archaeological sites on the property. Although, no development is planned for the areas where these resources are located archaeological monitoring will be done during all earth moving activities to insure that any resources discovered will be handled and preserved properly.

Hydrology

Water Quality & Quantity

Paraiso is currently performing all appropriate testing for the various water sources that will supply both the potable water, irrigation water and fire protection water. Pools and baths will use the natural water flow on the property. The update to this section will be submitted in the future when all tests are completed.

Grading/Erosion Control/Drainage

Grading

The conceptual grading plan produces the approximate quantity of earthwork cuts and fills. Please see CH2MILL technical memo titled “Paraiso Springs Resort: Preliminary Site Earthwork Report” found in Appendix A. As indicated in this report, the cuts and fills essentially balance.

Erosion Control

The majority of the planned development will impact approximately 50 acres of the 240 acre project site. Within the development envelope the existing ground gradients vary from approximately 8% at the relatively flat eastern end of the site, to approximately 12% at its western end. The existing ground in the north-central timeshare development areas of the site has slopes up to approximately 33%. The terrain surrounding the development envelope and above the envelope has even steeper slopes. The main drainage is a defined channel which traverses the middle of the development from west to east, with several smaller, steeper drainage swales entering the development area from the north to south. Refer to CH2MILL technical memo titled “Paraiso Springs Resort: Preliminary Erosion Protection Measures” incorporated in this general development plan as Appendix B.

Drainage

The project site is shown on the Flood Insurance Rate Map (FIRM) for Monterey County, California (Unincorporated Areas), Panel Number 060195 0350 D, dated January 30, 1984. This Map indicates that the Project Site is in Zone C – areas of minimal flooding. Approximately 23 acres of the project site will contain impermeable surfaces because this is such a small % of the overall drainage basin at 2% no significant increase in outflow is anticipated. The main drainage channel that runs west to east through the development envelope has an approximate width of 50'. The current bank full capacity of the primary drainage channel is approximately 4000 cfs. It is estimated that approximately 400 cfs of runoff would be generated from the watershed above the east boundary of the project site during a 1% (100 year) storm event. Therefore the existing channel should have adequate capacity to convey upstream flows through the site. Please refer to CH2MILL technical memo “Paraiso Springs Resort: Existing Hydrologic and Hydraulic Site Conditions” found in Appendix C.
Biological Survey

The property is comprised of developed areas that contain buildings, trails, roads, wells, landscaping plants, eucalyptus, and palm trees, areas of live oak woodland, Diablan sage scrub, and Baccharis scrub, riparian and annual grasslands. Many species inhabit the area including deer, rabbits and wild turkeys. The majority of the proposed development will be done in areas that are already developed or disturbed. No rare plant species were found during the surveys. The Monterey dusky-footed woodrat nests were noted during the surveys in the lower willow riparian area. The Monterey dusky-footed woodrat is a California Species of Concern. The Areas in which they were found are not proposed for development. The main wetland pond on the property will be preserved and enhanced during the development process. Refer to the Biological assessment report provided by Rana Creek Habitat Restoration the project biologist.

Aesthetics

Paraiso Hot Springs is located at the western terminus of Paraiso Springs Road on the eastern slope of the Sierra de Salinas foothills about seven and a half miles north-northwest of the city of Soledad. The site consists of about 240 acres nestled in the mouth of a canyon extending westward into the foothills. The surrounding land is designated as farmlands and rural grazing and is currently used for agriculture and vineyards where slope allows, and grazing and watershed in the steeper areas. Several residences are located below (east of) the resort on Paraiso Springs Road. However, topography and vegetation screens the resort from those residences. The site is only visible on the approach from Paraiso Springs Road above the residences, where it can be identified by several tall palm trees. Existing structures include several mobile homes, a lodge, pool house, conference room, pump and tool sheds, and bathhouses. None of these structures are visible until one arrives at the site. It should be noted that these structures also have existing nighttime lighting.

Noise

Paraiso Springs is nestled in a canyon extending westward into the eastern slope of the Sierra de Salinas foothills. The property is only visible on approach from Paraiso Springs Road. Geographic isolation and topography minimize noise impacts associated with the new development. To minimize any increase in noise to the residents along Paraiso Springs Road generated by any additional traffic the spa/resort will implement the following vehicle reduction strategies: 90% of the employees will be shuttled from the Soledad park and ride, 20% of the visitors will make use of the resort provided shuttle to and from the airport, most guests will be on a 4-day or 7-day programs, electric carts will be utilized by guests on-site and no private vehicles will be permitted on roads surrounding hotel units. With the above strategies in place the noise levels should not exceed previous historic levels.

Energy Resources/Conservation

PG&E currently supplies electricity to three locations at Paraiso Hot Springs. Suburban Propane currently provides propane service to the property. The spa/resort will use alternative energy sources where appropriate. While the spa/resort will remain connected to the power grid to insure a constant power source, a net metering program will be explored with the California Department of Energy. Alternative energy sources that are viable options at Paraiso include both passive and active solar solutions and wind energy. During the detailed design phase an in-depth investigation and design of alternative energy will be conducted and instituted where feasible. Other energy conservation measures will be implemented during the design such as the specification of energy saving construction materials which could include but not be limited to the use of thermo-pane windows, weather stripping around doors, windows, wrapped heating ducts and hot water plumbing.

Thompson Holdings, LLC
Transportation

Paraiso Springs Road is a two lane county road which terminates at Paraiso Hot Springs. The Paraiso Springs Development Plan is accompanied by a detailed traffic analysis report prepared by Higgins Associates that concludes that with the development of the proposed project an adequate level of service on Paraiso Springs Road will be maintained, that there is ample capacity, and that there are no congestion problems for the foreseeable future.

Air Quality

Monterey County is part of the North Central Coast Air Basin. The air quality in the area is generally favorable. The spa/resort will employ several transportation management strategies such as shuttling of the employees from the Soledad Park and ride, providing a shuttle for guests to and from the Monterey Airport and use of emission free (electric) golf carts on site. Clean burning gas sources such as propane will be used in any new fireplaces.

Hazards

Fire

The property is located in an area subject to high fire hazards. Soledad is the closest fire department. The State Department of Forestry also serves the area. Current fire protection on site consists of fire hydrants, three (3) on site wells and storage tanks (totaling 23,000 gallons), hoses, alarms, fire pump and extinguishers. The project will implement a fire protection plan which will include a wet hydrant network, supplied by a dedicated fire water pipeline system that will be separate from the spa/resort's potable water system, a "Fire Safety Plan" will be instituted at the resort, use of fire resistant building materials, commercial sprinkler systems in all structures and a detailed maintenance plan for the maintaining all existing/new equipment and fire breaks. Please reference the CH2MILL technical memo titled "Paraiso Springs Resort: Preliminary Fire Protection Plan" attached as Appendix D. The above referenced technical memo was developed through consultation with Frank Royos (CA Dept. of Forestry) and Art Black (Carmel Valley Fire Protection Consultants).

Earthquakes

To minimize damage from earthquakes the spa/resort will implement best practices in both building and site design as stated in the Geological and Geotechnical Report provided by Landset Engineers on the Paraiso Resort Project.

Security/Police Protection

Paraiso Hot Springs is located in County Sheriffs Patrol Beat 10. This Beat covers a large area and is sparsely populated, and therefore has relatively long response times. An increased number of visitors at the resort may increase the likelihood of crime. Paraiso anticipates that the project will have on-site security and that all visitors will pass thru a manned gated entrance. The county Sheriff's department at that point would be a second responder to any crime at Paraiso. Paraiso management (John M. Thompson) communicated in detail the intentions of the project with the King City Sheriff's office (Sergeant Bass) on June 7, 2005 and found that the on-site security and manned gated entrance were consistent with what the Sheriff's department would have suggested for crime prevention. The Sheriff's department also noted that Paraiso was located in an already low crime area.
Solid Waste/Sewage

Solid Waste

The spa/resort will adopt a composting procedure for all kitchen waste, a solid recycling and separation facility will be established and trash will be disposed of by Rural Garbage and Disposal Service Company.

Sewage

The current resort uses a septic tank with leach field to treat and dispose of all wastewater generated by the resort. The redevelopment of the spa/resort will result in an increase in the amount of wastewater generated by the project. It is not feasible to use a standard septic system with leach field technology due to the land area that is required for disposal. The project will implement an enhanced on-site treatment system with subsurface irrigation as the method of disposal of the effluent. Reference the technical memo provided by CH2MHILL title "Paraiso Springs Resort: Wastewater Treatment System" included as Appendix E.

Alternative Development Opportunities

Because of the unique natural resources located on the property and the existing resort uses, no other alternative development opportunities exist.

Consistency Analysis to the Policies of the Central Salinas Valley Plan

<table>
<thead>
<tr>
<th>Central Salinas Valley Plan Policy</th>
<th>Consistency Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1.2.1 (CSV) Development shall be designed to maintain groundwater recharge capabilities on the property.</td>
<td>The Paraiso Springs Development Plan calls for recharging of groundwater by taking secondary treated water and using drip irrigation throughout the development to promote reuse of water and water percolation. Therefore, the Paraiso Springs Development Plan is consistent with this policy.</td>
</tr>
<tr>
<td>6.1.3 (CSV) New development shall be phased to ensure that existing groundwater supplies are not committed beyond their safe-long term yields in areas where such yields can be determined by both the Director of Environmental Health and the Flood Control and Water Conservation District. Development levels which generate a water demand exceeding the safe-long term yields of local aquifers shall only be allowed when additional-satisfactory water supplies are secured.</td>
<td>The Paraiso Springs Development Plan is submitted with water demand calculations for the resort in its entirety. Primary sources for all water are located on the property. These sources are believed to have safe long term yields that can meet the demands of the new development. Therefore, the Paraiso Springs Development Plan is consistent with this policy.</td>
</tr>
<tr>
<td>14.3.1 (CSV) The County should encourage energy-efficient business and agricultural practices.</td>
<td>The Paraiso Springs Development Plan calls for the resort to be energy efficient and if possible energy independent. During the detailed building design phase detailed studies will be done to incorporate into design energy efficient technologies inclusive of but not limited to solar energy, thermo-pane windows, weather stripping around doors, windows, and wrapped</td>
</tr>
<tr>
<td>Code</td>
<td>Text</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>14.3.2 (CSV)</td>
<td>The County should encourage the development and utilization of renewable energy sources such as solar, wind generation, and biomass technologies in the Central Salinas Valley.</td>
</tr>
<tr>
<td>16.2.1.1 (CSV)</td>
<td>Site plans for new development shall indicate all flood plains, flood hazards, perennial or intermittent streams, creeks, and other natural drainages. Development shall not be allowed to occur within these drainage courses nor shall development be allowed to disturb the natural banks and vegetation along these drainage courses, unless such disturbances are approved by the Flood Control and Water Conservation District. Development shall adhere to all regulations and ordinances related to development in flood plains.</td>
</tr>
<tr>
<td>21.1.2.1 (CSV)</td>
<td>Groundwater recharge areas must be protected from all sources of pollution. Groundwater recharge systems shall be designed to protect groundwater from contamination and shall be approved by both the Director of Environmental Health and the Flood Control and Water Conservation District.</td>
</tr>
<tr>
<td>21.3.1.4 (CSV)</td>
<td>Development shall meet both water quality and quantity standards expressed in Title 22 of the California Administrative Code and Title 15.04 of the Monterey County Code subject to review of the Director of Environmental Health.</td>
</tr>
<tr>
<td>21.3.1.5 (CSV)</td>
<td>New development shall meet the heating ducts. Therefore the Paraiso Springs Development Plan is consistent with this policy.</td>
</tr>
<tr>
<td>Paraiso Springs General Development Plan</td>
<td>Project Description</td>
</tr>
<tr>
<td>----------------------------------------</td>
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</tr>
<tr>
<td>minimum standards of the Regional Water Quality Control Basin Plan when septic systems are proposed. The minimum lot size shall be one acre. New development shall provide evidence to the Director of Environmental Health that any proposed septic systems will not adversely affect groundwater quality. Inclusionary and clustered housing shall also meet the 1 acre/unit density when septic systems are proposed.</td>
<td>not propose any septic tanks and instead proposes an on-site waste treatment system. Therefore, the Paraiso Springs Development Plan is <strong>consistent</strong> with this policy.</td>
</tr>
<tr>
<td><strong>26.1.4.3 (CSV)</strong> A standard tentative subdivision map and/or vesting tentative and/or Preliminary Project Review Subdivision map application for either a standard or minor subdivision shall not be approved until:</td>
<td></td>
</tr>
<tr>
<td>(1) The applicant provides evidence of an assured long term water supply in terms of yield and quality for all lots which are to be created through subdivision. A recommendation on the water supply shall be made to the decision making body by the County's Health Officer and the General Manager of the Water Resources Agency, or their respective designees.</td>
<td></td>
</tr>
<tr>
<td>(2) The applicant provides proof that the water supply to serve the lots meets both the water quality and quantity standards as set forth in Title 22 of the California Code of Regulations, and Chapters 15.04 and 15.08 of the Monterey County Code subject to the review and recommendation by the County's Health Officer to the decision making body.</td>
<td>The <strong>Paraiso Springs Development Plan</strong> provides in the associated drawing set a Preliminary Vesting Tentative Map. Also, we hereby incorporate answers from 6.1.3 CSV and 21.3.1.4 CSV listed above. Therefore, the Paraiso Springs Development Plan is <strong>consistent</strong> with this policy.</td>
</tr>
<tr>
<td><strong>CSV Policy 28.1.1.1 states:</strong></td>
<td></td>
</tr>
<tr>
<td>Recreation and visitor serving land uses for the Paraiso Hot Springs property may be permitted in accordance with a required comprehensive development plan. The resort may include such uses as a lodge, individual cottages, a visitor center, recreational vehicle accommodations, restaurant, shops, stables, tennis courts, aquaculture, mineral water bottling, hiking, trails, vineyards, and orchards. The plan shall address fire safety, access, sewage treatment, water quality, water quantity, drainage, and soil stability issues.</td>
<td>The <strong>Paraiso Springs Development Plan</strong> herein submitted is a comprehensive plan that addresses fire safety, access, sewage treatment, water quality, water quantity, drainage, and soil stability. In this plan specifically, the existing drainage pattern and riparian areas on the property are preserved and to the extent that that drainage pattern contributes to the riparian area below the property then that area would also be undisturbed. The proposed resort uses are also consistent with this policy. Therefore, the Paraiso Springs Development Plan is <strong>consistent</strong> with this policy.</td>
</tr>
<tr>
<td><strong>28.1.1.2 (CSV)</strong> Recreation and visitor-serving commercial uses shall only be allowed if it can be proven that:</td>
<td></td>
</tr>
<tr>
<td>1. areas identified by the Flood Control and Water Conservation District as prime-groundwater recharge areas can be preserved and protected from sources of pollution as determined by the Director of Environmental Health and the Flood Control and Water Conservation District;</td>
<td></td>
</tr>
<tr>
<td>2. proposed development can be phased to ensure that existing groundwater supplies are not committed beyond their safe-long term yields where such yields can be determined by both the Director of Environmental Health.</td>
<td>The <strong>Paraiso Springs Development Plan</strong> herein submitted includes plans for addressing recharge and pollution issues, demonstrating a long term water supply and water balance, handling runoff and riparian areas. See also responses to Policies 6.1.3, 21.3.1.4, 26.1.4.3, and 28.1.1.1. Therefore, the Paraiso Springs Development Plan is <strong>consistent</strong> with this policy.</td>
</tr>
</tbody>
</table>
and the Flood Control and Water Conservation District;
3. the main channels of either the Arroyo Seco River or the Salinas River will not be encroached on by development because of the necessity to protect and maintain these areas for groundwater recharge, preservation of riparian habitats, and flood flow capacity as determined by the Flood Control and Water Conservation District;
4. the proposed development meets both water quality and quantity standards expressed in Title 22 of the California Administrative Code and Title 15.0.4 of the Monterey County Code as determined by the Director of Environmental Health;
5. the proposed development meets the minimum standards of the Regional Water Quality Control Basin Plan when septic systems are proposed and also will not adversely affect groundwater quality, as determined by the Director of Environmental Health; and
6. the proposed development will not generate levels of runoff which will either cause erosion or adversely affect surface water resources as determined by the Flood Control and Water Conservation District Recreation and visitor-serving commercial uses shall only be allowed if

28.1.1.3 (CSV) All recreation and visitor-serving commercial land uses shall require a use permit on sites of 10 acres or less. On sites greater than 10 acres, visitor serving recreation and commercial uses may be permitted in accordance with both a use permit and a required comprehensive development plan. The comprehensive development plan shall address hydrology, water quantity and quality, sewage disposal, fire safety, access, drainage, soils, and geology. The Paraiso Springs Development Plan calls for development greater than 10 acres. The comprehensive plan addresses hydrology, water quantity and quality, sewage disposal, fire safety, access, drainage, soils, and geology. Therefore, the Paraiso Springs Development Plan is consistent with this policy.
APPENDIX A: PRELIMINARY SITE EARTHWORK REPORT
The purpose of this memorandum is to provide a preliminary analysis of cuts and fills and mass grading quantities for the proposed Paraiso Springs Resort, based on the conceptual Project Grading Plan prepared by EDSA and delivered in electronic format to CH2M HILL on April 7, 2005. The Grading Plan depicts conceptual contour grading for the site, which includes a 103-room Resort Hotel with Spa and Fitness Center facilities; a Hamlet Day Spa; 17-for-sale Single Family Home Lots; 60 for-sale condominiums; 310 parking spaces, and approximately 11,100 linear feet of private roadways. The total property area is approximately 240 acres, with approximately 50 of those acres impacted by earthwork operations.

SUMMARY

The conceptual Grading Plan produces the approximate quantities of earthwork cuts and fills shown in the table below:

<table>
<thead>
<tr>
<th>Region</th>
<th>Total SF</th>
<th>Raw Cut CY</th>
<th>Raw Fill CY</th>
<th>Fill Factor</th>
<th>Net Cut CY</th>
<th>Net Fill CY</th>
<th>Net Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stripping Resuse</td>
<td>2,083,521</td>
<td>38,584</td>
<td>0</td>
<td></td>
<td>38,584</td>
<td>0</td>
<td>38,584</td>
</tr>
<tr>
<td>Earthwork</td>
<td>2,083,521</td>
<td>123,489</td>
<td>109,871</td>
<td>1.150</td>
<td>123,489</td>
<td>126,352</td>
<td>-2,863</td>
</tr>
<tr>
<td>Job Total</td>
<td>2,083,521</td>
<td>162,073</td>
<td>109,871</td>
<td>1.150</td>
<td>162,073</td>
<td>126,352</td>
<td></td>
</tr>
</tbody>
</table>

As indicated, the cuts and fills essentially balance. The 2,863 cubic yards of excess fill is a minor amount of material at only 2-3% of the cut volume. This volume of “import” can easily be avoided by minor adjustments to the site grades.

The earthwork balance does not include disposal of the topsoil strippings, which total approximately 38,584 cubic yards. These strippings typically contain organic materials such as grass, weeds, shrubs and roots and are therefore not acceptable as engineered fill material.
for construction. The stripped material should be stockpiled for possible use in landscape areas, the vineyard, on-site disposal, or sale off-site.

The fill heights range up to a maximum of approximately 14 feet, with the highest fills needed to construct the main Hotel complex and adjacent Hamlet, and the roadway leading to the western-most cluster of condominiums.

The depths of cut generally are less than 10 feet throughout the site. However, deep cuts of up to 25 feet are required for the parking area south of the Hamlet and the adjacent roadway. Significant retaining walls or upper slope benching will likely be required in this area. Input from the Geotechnical Engineer will be required for supplemental grading design of these cut areas and the higher fill areas.

**METHODOLOGY**

The earthwork volumes noted above were calculated by a computer program specifically designed to compute cuts and fills for land development projects similar to the Paraiso Springs Resort Project. The computer program computes the vertical differences between the existing terrain model developed from the aerial topography for this Project provided by Bestor Engineers, and the finish graded surfaces across the site that are defined by the conceptual Grading Plan provided by EDSA. The vertical differences are computed as cubic yards of cut and fill. The computations were done under CH2M HILL's direction, by EARTHCALC Incorporated, a vendor who specializes in site earthwork quantity calculations.

**ASSUMPTIONS**

The earthwork computations reported herein are based on the following assumptions:

1) Six (6) inches of topsoil stripping will be required at all construction areas. The actual amount of stripping may vary from this assumed value, and should be determined by the Geotechnical Engineer, based on site conditions at the time of construction.

2) A shrinkage factor of 15% has been applied to the fill quantity to address the potential density differential between soil excavated on-site and subsequently placed as compacted engineered fill. The final shrinkage factor should be recommended by the Geotechnical Engineer, based on actual soil conditions and soil types, and construction methods.

3) All roadway pavement sections were assumed to have a structural section one (1) foot thick. This structural section is assumed to contain the driving surface material(s) and all imported subgrade material (ie; baserock, etc.). As of this date, pavement sections have not yet been designed. Actual pavement sections should be designed by the Geotechnical Engineer, based on sub grade soil “R” values and surface materials selected by the Owner (ie: concrete; asphalt concrete; stone pavers, etc.).

4) All building foundation sections were assumed to be one (1) foot thick concrete slab-on-grade, including concrete slab and sand/gravel subgrade materials. Actual foundations sections will likely vary from this assumption, based on the different building types. No architectural construction details for foundations are available at this time.
5) All recommendations contained in the Geologic and Soils Engineer’s Feasibility Report, dated December 2004, and prepared by Landset Engineers, Inc, will be followed during final design and construction.

6) All existing, on-site buildings and related structures will be demolished, prior to earthwork operations.

7) All earthwork operations will be essentially completed in a single construction operation, such that stockpiling/borrowing of soil materials will not be required to support future grading operations. No analysis was done to determine quantities of earthwork materials required for project phasing.

SUPPORTING DATA

Supporting data for this earthwork analysis includes the previously referenced site topographic survey, conceptual Project Grading Plan and Geotechnical Engineer’s Report. These documents are not attached to this memorandum, but are available separately.

The earthwork quantity take-off from EARTHCALC, displayed as a cut/fill map, is shown on Sheet CG1.1 – Proposal Excavation and Embankment Plan, bound separately.
APPENDIX B: PRELIMINARY EROSION PROTECTION MEASURES
Paraiso Springs Resort: Preliminary Erosion Protection Measures

The purpose of this Memorandum is to provide a preliminary description of proposed erosion protection measures that will be implemented for the planned development of the Paraiso Springs Resort, as shown on the conceptual Site Plan and Grading Plan prepared by EDSA.

SUMMARY

Construction of the planned development will impact approximately 50 acres of the 240 acre Project Site. Within this construction zone, existing ground gradients vary from approximately 8% at the relatively flat eastern end of the site, to approximately 12% at its western end. Existing ground in the north-central condominium development areas of the Site has slopes up to approximately 33%. Existing terrain surrounding and above the construction zone has even steeper slopes. One major drainage in a defined channel traverses the middle of the development from west to east, with several smaller, steeper drainage swales entering the development area from the north and south.

The site surface soils are erodible, as noted in the Geologic and Soil Engineering Feasibility Report, dated December 2004, prepared by Landset Engineers Inc. In addition, the Report states that the steep hillside areas above the development are susceptible to landslides and debris flow. These areas are generally delineated on the Relative Geologic Hazards Map included in the Report.

Proposed erosion control measures for the Project include temporary measures to prevent erosion and sedimentation from construction operations, and permanent measures. The temporary erosion control measures will include Best Management Practices (BMPs) for construction activities, such as:
• Construction vehicle access pads at the County Road project entrance and at access points off any constructed roadways
• Material hauling
• Construction material storage
• Dust control
• Construction vehicle maintenance and fueling
• Hazardous materials storage
• Use of hay bales, straw matts and waddles at new cut and fill slopes
• Hydroteering cut and fill slopes prior to rainy season
• Contractor employee training
• Settling basins for dewatering areas
• Concrete truck wash out basins

An NPDES Notification for this Project will have to be filed with the Water Resources Control Board, and a site-specific Stormwater Prevention Plan prepared, prior to construction activities beginning.

The permanent erosion control measures should include the following features:

• Debris walls, diversions or basins constructed in the upper portions of the drainage swales leading to the development site, as recommended in the previously referenced Geologic and Soil Engineering Feasibility Report. Based on the Relative Geologic Hazards Map, there appear to be five (5) drainages above the site that could contribute significant debris flows to the Project area, and should be addressed. Design of these facilities will require additional soils, hydraulic and site investigations, and should be done in conjunction with the site storm drainage design.

• Interceptor drainage ditches on hillsides above the development, to divert upland surface runoff around single-family lots, buildings, spa/fitness facilities, and retaining walls. Drainage ditches should also be constructed on the uphill sides of perimeter roadways and trails to collect runoff and channel it to collection points. These ditches should be grass-lined swales to the extent possible, to encourage water percolation and blend in aesthetically with surrounding areas. However, ditches with longitudinal slopes greater than 4-5% will require harder surfacing such as rock, cobblestone or concrete.

• Roadway/parking lot gutters, constructed to collect and convey roadway/parking drainage to a storm drainage system.

• Benches with drainage ditches, above large cut/fill slopes, as directed by the geotechnical engineer.

• Jute netting, erosion control matts, or hydroteering, in conjunction with landscape planting on all steep (greater than 4:1) finish slopes.

• Hydroteering or landscaping on all areas of the Project that are disturbed by construction.

• Storm drainage collection system, including roof gutters/leaders, lined/landscaped swales, catch basins and underground pipe collection system for the entire Project area.

• Appropriate agricultural soil conservation measures to limit erosion/runoff from the Vineyard Area.

• Channel invert and bank stabilization measures, such as rock or biomechanical slope protection, for the main drainage channel through the Project site. These features should...
be designed to be compatible with the landscape design theme for the drainage area, and must safely incorporate storm drainage outfalls from site drainage facilities. It is likely that design of this drainage facility must be coordinated with and permitted by the CA Dept. of Fish and Game.

ASSUMPTIONS
The following assumptions pertain to the preliminary erosion protection plan described above:

- All recommendations of the geotechnical engineer will be followed regarding slope stability and subsurface drainage, within the Project
- A master storm drainage plan will be prepared to further evaluate drainage conditions around and through the site.
- Pervious materials will be used to the extent possible for roadways, walkways and parking areas.

SUPPORTING DATA
The Project Site Plan prepared by EDSA and the Geologic and Soil Engineering Feasibility Study were used in the development of this Memorandum.
APPENDIX C: EXISTING HYDROLOGIC AND HYDRAULIC SITE CONDITIONS
This Memorandum provides a preliminary analysis of the current hydrologic and hydraulic conditions of the Paraiso Springs Resort (Project) Watershed and the potential for site flooding.

SUMMARY

Watershed Description

The Project is located south of Soledad and east of Greenfield, in Monterey County California. The Paraiso Springs drainage, which flows through the proposed development, begins on the eastern slopes of the Sierra de Salinas Mountains and in the westerly portion of the Arroyo Seco Watershed, travels northeasterly to the Arroyo Seco Valley floor, where flows are collected and enter the Arroyo Seco River. The Arroyo Seco River is a major tributary to the Salinas River.

The primary drainage basin, tributary to the Paraiso Springs channel, extends from the southwest, at elevation 2400 feet (NGVD), to the northeast project boundary, at elevation 1000 feet. The basin is approximately 1160 acres in size, and is surrounded by mostly undeveloped and rural agricultural land uses. The mountains and hillsides that are the primary sources of flows to the creek are covered by a mixture of native oak savannas, sycamore river valleys, grasslands, and scrub chaparral. The average slope of the hills to the southwest of the project site is 0.40 ft/ft. The average slope of the hills to the west of the
project site is 0.36 ft/ft. Topographic contour patterns show that there are four points within the basin that collect and transfer flows from the higher areas of the basin to the existing stream.

Precipitation & Historical Flows
As discussed below, hydrologic data utilized in this memorandum was not compiled by the authors and could be confirmed or modified through direct measurement utilizing rainfall and stage gages present near or at the project site.

Average annual rainfall in the Project area is approximately 11-inches. Storms are few and infrequent and primarily occur in January and February. Two recent flood events occurred in January and in March of 1995, when almost 10-inches of rain fell in the watershed over five days. Using the Monterey County Rainfall Intensities Chart, the March 1995 storm was approximated to be between a 10- and 20-year event. Some damage to the pools and the road on the site was reported. This damage included a culvert whose capacity was greatly reduced by debris, brush and rocks.

Channel Characteristics
The main drainage channel through the Project site has an approximate width of 50 feet. The adjacent lands southerly of this channel are relatively flat and extend several hundred feet beyond the top of bank. The Soil Engineering Feasibility Report discusses existing soil conditions and the potential for landslides and debris production within the project area. This Report indicates that sediment and debris produced in the steeper portions of the drainage basin will migrate into the channel and will require management.

The channel slope upstream of the Project site (approximately 50 percent of its total length) is 0.25 ft/ft. The channel slope in the valley section of the channel (the length of the Project site) is approximately 0.112 ft/ft. The expected average channel velocity, within the Project site, is in the order of 27 ft/sec, at a full bank flow condition. This velocity, in combination with existing soil conditions, illustrates a potential for channel erosion during infrequent storm events.

Flood Zone
The Project site is shown on the Flood Insurance Rate Map (FIRM) for Monterey County, CA (Unincorporated Areas), Panel Number 060195 0350 D, dated January 30, 1984. This Map indicates that the Project Site is in Zone C – areas of minimal flooding. Although this indicates the Project site is not within a flood hazard area, FEMA requires all new construction to be built at the base flood elevation, which is 1-foot above the elevation of the top of bank, for undesignated flood hazard areas.

Paraiso Resort Site
The Project site, approximately 240 Acres, encompasses 21 percent of the total basin area. Only approximately 23 acres of the Project site is expected to contain impermeable surfaces. Because this is such as small percentage of the overall drainage basin at 2%, no significant increase in outflow from the basin is anticipated. However, because the project is to be built
in the flatter lands that are tributary to the drainage channel, an impact to the current drainage patterns can be expected. Flows that are now delivered to the main channel via the four collection points, as discussed in Watershed Description, and overland sheet flow, will require collection and routing via culverts, piped storm drainage systems, or ditches with erosion protection. The appropriate sizing, locations and erosion protection measures for the drainage systems will be developed during subsequent Project design phases. Likewise, emergency surface drainage releases, for flow volumes beyond the design capacity of the drainage systems, will need to be provided to divert sheet flows around buildings.

The current, bankfull capacity of the primary drainage channel is approximately 4,000 cfs, excluding any existing culverts. It is estimated that approximately 400 cfs of runoff will be generated from the watershed, above the west boundary of the Project site, during a 1% (100-year) storm event. Therefore, the existing channel should have adequate capacity, with freeboard, to convey upstream flows through the site, provided that all roadway crossings of the creek provide a waterway opening that is comparable to the existing channel section. Also, erosion protection measures, such as bed stabilization, toe protection and bridge scour protection, should be implemented for the channel to preserve the channel cross section and minimize sedimentation downstream.

Conclusions

Subsequent design phases for the Project should consider the following:

- The Project is situated in an area tributary to a natural drainage channel and has the potential to impact the current site drainage patterns.
- The Project Site is not subject to flooding from a 1% (100-year) storm event, provided that the existing channel waterway cross section is maintained.
- Water surface elevations and velocities in the channel will need to be determined. Grading required for building pads and/or the foundations of all structures will be one (1) foot above the drainage channel banks. The grading or construction required for flood protection throughout the development area will be fully coordinated with the site's tree preservation requirements.
- There is a potential for significant sediment and debris production from the upper watershed. Debris basins upstream of the development should be implemented and a maintenance plan prepared.
- Efforts to control possible flooding should be considered, including:

  - diversion and/or containment of runoff above developed areas
  - measures to limit erosion of the main drainage channel
  - maintenance of the channel to prevent blockage
  - overland flow patterns should be established around proposed buildings, as part of the finish grading plan
METHODOLOGY AND ASSUMPTIONS
The preliminary hydrology data presented in this Memorandum were developed using a rough analysis of the SCS Curve Number method. Storm distributions for a duration of 24 hours were developed by SCS from U.S. National Weather Service data as typical design storms. In the SCS method, the intensity of rainfall varies considerably during the storm period. A Type 1 storm is used for areas in Central California. Runoff is affected by ground cover, soil type, and topography.

SUPPORTING DATA
Assumptions for soil type, ground cover and topography were based on cursory reviews of the Geology and Soil Engineering Feasibility Report for the Project, USGS Quadrangle maps, and field visits. A Watershed Map, based on a USGS Quadrangle Map, is attached.
APPENDIX D: PRELIMINARY FIRE PROTECTION PLAN
Paraiso Springs Resort: Preliminary Fire Protection Plan

This Memorandum provides a description of the fire protection systems that will support the planned development of the Paraiso Springs Resort, as shown on the conceptual Site Plan and Grading Plan prepared by EDSA (Project).

SUMMARY

The fire protection system for the Project will be a wet hydrant network, supplied by a dedicated fire water pipeline system that will be separate from the Project’s potable water system. Each hydrant will have one four-inch and two, two and one-half-inch connections. A total of sixteen (16) hydrants will be provided and located throughout the site as indicated on the attached map. The flow capacity for each hydrant will be 1,000 gallons per minute (gpm).

In addition to the wet hydrant system, all buildings on site will be sprinklered. A commercial sprinkler system will be provided for the Hotel/Spa Resort Complex, the Hamlet and the condominiums, and it will be supplied by the fire water pipeline system. Requirements for fire flow are based on sprinkler demand for the Project’s largest building (Hotel Conference Center Wing @ 25,000 sf), along with one adjacent hydrant. Based on this building size, up to 500,000 gallons of fire water storage will be provided for the on-site fire suppression system. The precise storage volume for the Project will be established through detailed engineering studies preformed during the Design Development phase of the Project.

A water reservoir of up to 500,000 gallons will be provided on-site to support the hydrant and commercial building sprinkler systems. The potential reservoir options are:

- A steel tank, located at the west end of the development, above the western-most condominium units. Assuming a pressure of 40 psi will be required at the highest hydrant (elevation approximately 1305 ft), this tank will need to be located above elevation 1410 ft.
• An on-site artificial lake or storage pond. In conjunction with this artificial lake, a fire pump would be utilized, because most likely, the lake would be located at an elevation below most of the development and therefore gravity flow would not work. The fire pump would be approximately 2,000 gpm capacity.

The water for the fire protection system will be from an on-site source.

The condominiums and single-family homes will also be sprinklered. Most likely, these sprinklers will be connected to the potable water system, on the homeowner's side of their water meter.

A series of Fire Department Connections (four total) will also be installed around the Hotel building and entrance, as shown on the attached map. The commercial and residential fire sprinkler systems, along with the hydrant system, will be designed by a licensed Fire Protection Engineer.

Other fire protection Project elements include:

• Twelve (12) foot wide (minimum) access roads by the Spa, Fitness Center and condominiums,
• Adequate vehicle turn-arounds at end of roadways,
• Access Road Bridge across creek must be designed for highway loading standards (HS-44).

METHODOLOGY

The technical data contained in this Memorandum is based on information received from Mr. Frank Royos/CA Dept. of Forestry and Mr. Art Black/Carmel Fire Protection Association, who have fire protection jurisdiction for the Paraiso Springs area of Monterey County.

ASSUMPTIONS

The following assumptions pertain to the preliminary fire protection system described above:

1) A water reservoir, either a steel tank or an artificial lake, can be located on the project site and constructed in conformance with recommendations from the Geotechnical Engineer. The reservoir will have a storage volume of up to 500,000 gallons, which will be maintained at all times.

2) The on-site source is capable of supplying enough water to fill the fire water reservoir on a regular basis, for an indefinite period of time, within an acceptable timeframe after reservoir drawdown.

3) The Project fire suppression system layout and capacity will be verified during subsequent Project design phases.

SUPPORTING DATA

Refer to the attached map for a general layout of fire hydrants and fire department connections. This data was provided by Frank Royos in March 2005, and Art Black in May 2005.
APPENDIX E: WASTEWATER TREATMENT SYSTEM
Paraiso Springs Resort: Wastewater Treatment System

This memorandum describes the proposed wastewater collection, treatment, and disposal system for the 240-acre Paraiso Springs Resort. The proposed enhanced onsite treatment (EOT) system was selected for its ability to meet several important design and performance criteria, including:

- Compliance with state and county water quality requirements
- High reliability and ease of maintenance
- Low operations and maintenance costs
- Very low to no odors
- Capability of below-ground installation
- Small footprint
- Ability to handle daily and seasonal variations in wastewater flow

Background and Assumptions

The following paragraphs summarize key background information and assumptions that influenced the choice of treatment technology and preliminary design and performance characteristics.

Wastewater Load

The wastewater load was estimated by assigning Monterey County code-defined sewage flow rates\(^1\) to each of the facility types contained in the Paraiso Springs Resort Data Table. The basis of this information is the Project Master Plan prepared by EDSA and the March 16, 2005 Hill Glazier Architects Building Program provided to CH2M HILL. The building program includes a resort hotel with spa and fitness center facilities; a hamlet day spa and retail facilities; single-family home lots; condominiums; and other miscellaneous facilities.

The total estimated wastewater load is 57,660 gallons per day, as shown in Table 1, below.

---

\(^1\) Monterey County Codes: Title 15, Chapter 15.20 Sewage Disposal, Section 15.20.070 Standards and Specifications, Table C: Quantities of Sewage Flow. Obtained from web site at [http://municipalcodes.lexisnexis.com/codes/montereyco](http://municipalcodes.lexisnexis.com/codes/montereyco).
## TABLE 1: ESTIMATED WASTEWATER LOAD FOR PARAISO SPRINGS RESORT

<table>
<thead>
<tr>
<th>Facility</th>
<th>Number of Units</th>
<th>Unit Load (gallons/day)</th>
<th>Total Load (gallons/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotel Guestrooms (accounts for guest use as well as Institute meeting rooms, banquet rooms, back of house food, beverage, and laundry, and hotel support facilities)</td>
<td>103 rooms</td>
<td>60</td>
<td>6,420</td>
</tr>
<tr>
<td>Hotel Restaurants</td>
<td>205 seats</td>
<td>1,000 + 30/seat</td>
<td>7,150</td>
</tr>
<tr>
<td>Hotel Bar</td>
<td>20 seats</td>
<td>15 gal/seat</td>
<td>300</td>
</tr>
<tr>
<td>Spa Restaurant</td>
<td>33 seats</td>
<td>1,000 + 30/seat</td>
<td>1,990</td>
</tr>
<tr>
<td>Hamlet Coffee Bar</td>
<td>50 seats</td>
<td>1,000 + 30/seat</td>
<td>2,500</td>
</tr>
<tr>
<td>Institute Culinary School</td>
<td>1 school</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Institute (second phase construction)</td>
<td>10 people</td>
<td>15</td>
<td>150</td>
</tr>
<tr>
<td>Hamlet Stores</td>
<td>5 stores</td>
<td>1,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Hamlet Day Spa</td>
<td>50 guests</td>
<td>35</td>
<td>1,750</td>
</tr>
<tr>
<td>Pet Spa</td>
<td>1 unit</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Wine Pavilion</td>
<td>30 guests</td>
<td>15</td>
<td>1,000</td>
</tr>
<tr>
<td>Teahouse</td>
<td>10 guests</td>
<td>15</td>
<td>1,150</td>
</tr>
<tr>
<td>Spa and Fitness Facilities</td>
<td>150 guests</td>
<td>35</td>
<td>5,250</td>
</tr>
<tr>
<td>Hillside Condos</td>
<td>60 units</td>
<td>250</td>
<td>15,000</td>
</tr>
<tr>
<td>Single Family Residences</td>
<td>17 units</td>
<td>250</td>
<td>4,250</td>
</tr>
<tr>
<td>Resort Employees</td>
<td>250 people</td>
<td>15</td>
<td>3,750</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td><strong>57,660</strong></td>
</tr>
</tbody>
</table>

The calculations assume full occupancy and therefore represent the maximum estimated load. Note that the calculation does not double-count wastewater loading from hotel guests’ and employees’ use of toilet, shower, kitchen, and other wastewater-generating facilities. For example, the wastewater load for guest rooms includes (1) guest use of hotel rooms, (2) hotel guest use of restaurants & meeting and conference rooms, (3) hotel administrative staff needed to serve the guests, and (4) support functions such as hotel laundry.
Landscaping Plan
The landscaping plan includes the following areas:

<table>
<thead>
<tr>
<th>Landscaping Location</th>
<th>Estimated Area (Sq. Feet)</th>
<th>Estimated Area (Acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suites</td>
<td>80,000</td>
<td>1.8</td>
</tr>
<tr>
<td>Main Lobby &amp; Hamlet</td>
<td>82,000</td>
<td>1.9</td>
</tr>
<tr>
<td>Institute</td>
<td>12,000</td>
<td>0.3</td>
</tr>
<tr>
<td>Spa</td>
<td>3,500</td>
<td>0.1</td>
</tr>
<tr>
<td>Sports Facility</td>
<td>52,000</td>
<td>1.2</td>
</tr>
<tr>
<td>Villas at Sports</td>
<td>46,000</td>
<td>1.1</td>
</tr>
<tr>
<td>Villas Hillside (w)</td>
<td>85,000</td>
<td>2.0</td>
</tr>
<tr>
<td>Villas Hillside (e)</td>
<td>75,000</td>
<td>1.7</td>
</tr>
<tr>
<td>Hillside Meadows</td>
<td>300,000</td>
<td>6.9</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td><strong>735,500</strong></td>
<td><strong>17.0</strong></td>
</tr>
</tbody>
</table>

Irrigation Rates
Preliminary calculations by EDSA (project landscape architect)\(^2\) show that irrigation requirements, based on evapotranspiration data\(^3\) for the preliminary planting plan described above, vary from 1.0 million gal/month (minimum) during winter to 3.59 million gal/month (maximum) during the growing season.

Land Application Rate
An appropriate land application rate for subsurface irrigation was determined using an estimating tool provided by “GeoFlow,” a subsurface irrigation supplier. Using this tool, and based on previous and limited percolation tests by GeoSolutions LLC\(^4\) in 1998, we have conservatively estimated onsite soils to be Class II “loam” soils with a hydraulic loading rate of 0.7 gal/square foot/day.

Proposed System: Enhanced Onsite Treatment
Enhanced on-site treatment (EOT) improves upon septic/disposal field approaches by adding solids and grease removal and aerobic fixed media treatment.

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\(^2\) Irrigation requirement for preliminary planting plan estimates maximum 3.59 million gal/month during growing season and 1.0 million gal/month during winter season. Information conveyed by personal communication, Bill Thompson, June 15, 2005. Original data received by Bill Thompson from Kris Hansen/EDSA.

\(^3\) Kris Hansen, EDSA. Personal communication, July 7, 2005. Also referencing website [http://www.itrc.org/etdata/etmain.htm](http://www.itrc.org/etdata/etmain.htm).

Description

The EOT system is described as follows:

1. **Wastewater Conveyance:** Wastewater will be conveyed by gravity to septic tanks, where solids will be collected. The liquid portion will be pumped or gravity-fed to the onsite treatment system. The soils onsite are generally well-drained, and infiltration and inflow into sewers is not anticipated to be a problem. Regardless, sewers will be constructed with care to ensure a “tight” system. Septic tanks will be cleaned regularly to remove solids.

2. **Treatment Technology:** The AdvanTex biological treatment process (by Orenco Systems Incorporated) uses a treatment tank and a pump to recirculate wastewater within the treatment unit and draw air in from the outside. Biomass attaches to a non-woven textile medium to provide a large surface area for biological treatment. Part of the treated effluent is recirculated into the tank and part is diverted for dispersal by irrigation (as described below).

3. **Effluent Quality:** The treatment process produces secondary effluent, which can be further improved with additional filtration and disinfection. The treatment system will meet County and state standards for wastewater treatment.

4. **Dispersal Method:** The treated effluent will be conveyed to subsurface irrigation systems through pressurized lines. The pressurized lines allow the dosing volume and duration of wastewater disposal to be regulated in predetermined subsurface irrigation zones, thereby increasing the effectiveness of the dispersal system. This type of dispersal system recycles water in two ways – by offsetting potable water needed for irrigation, and by recharging groundwater through infiltration.

5. **Water Balance:** According to estimated land application rate, with the given wastewater load, the EOT system will require 82,371 square feet (1.9 acres) for disposal by subsurface irrigation. With approximately 17 acres of planned landscaping, the site provides ample area for wastewater disposal; indeed, subsurface irrigation water must be supplemented with potable water to meet the total irrigation demand, for most of the year.

6. **Nitrogen Loading:** For raw sewage disposal in septic/disposal fields, Monterey County code limits nitrogen loading to less than 300 gallons per acre per day. The recommended system meets this criterion in two ways. First, the given wastewater load of 57,660 gal/day amounts to an average load of 240 gal/acre/day (over the 240-acre site). Second, by treating sewage to secondary levels, the recommended system significantly reduces the nitrogen load compared to septic/disposal systems.

7. **Redundancy:** The system will incorporate several levels of redundancy to ensure failsafe operation, such as:
   - **Effluent storage:** A diversion valve in the sanitary sewer line will be provided to route wastewater flows to the septic tanks during shutdown for maintenance or emergency procedures. The septic tanks would ordinarily be empty and available to store three full days of sewage flow. Small submersible pumps will
be installed in the septic tanks to empty effluent back into the collection system when the treatment plant comes back on line.

- **Power:** Emergency power to operate the treatment plant will be provided by an onsite emergency generator.

- **Equipment:** Spare equipment will be kept on hand in the event of equipment failure.

8. **Monitoring:** Monitoring of the wastewater treatment system will be carried out in accordance with the Waste Discharge Requirements to be issued by the Regional Water Quality Control Board, in addition to specific items that may be requested by Monterey County.

9. **Location:** The enhanced onsite treatment unit will be located at the eastern end of the site, near the entrance, downhill from the main resort area. Irrigation lines will extend into various landscaped areas, to be determined during design.

**Advantages**

With reference to the selection criteria listed above, the advantages of this system are:

- The technology is simple and easy to maintain. For example, solids are removed from septic tanks every 5 to 7 years, compared to a much higher frequency for package treatment systems.
- Treatment units can be installed below ground.
- Modular configuration provides flexibility in design, an easy way to build in redundancy for reliability, and easy expansion in the future.
- The system can handle daily and seasonal variations in wastewater flow.
- Both types of enhanced on-site treatment systems described above are proven to be reliable and able to produce better-than-secondary type quality effluent, with lower nitrogen loading than conventional septic disposal systems.
- Energy consumption is low compared to package treatment plants.
- Very low to no odors.
- Some parts of the treatment system can be automated (blowers and pumps).
- Because this system provides a pressurized drip system, it can utilize steeper terrain than disposal fields.
- Backup storage is an integral part of the septic system connected to the enhanced onsite treatment system, thus not requiring additional storage capacity.

Please do not hesitate to contact me if you have any questions.

Sincerely,

[Signature]

Andrea C. Ramage, P.E.
Director, Sustainable Solutions
Appendix 2
2019 Fire Protection Plan

Dudek, 2019
May 16, 2019

Mr. John M. Thompson
Paraiso Springs Resort, LLC
P.O. Box 779
Spring House, Pennsylvania. 19477

Subject: Fire Protection Plan – Paraiso Springs Resort, Monterey County

Dear Mr. Thompson:

This fire protection plan (FPP) and associated technical analysis has been prepared for the Paraiso Springs Resort as a response to comments received regarding the planned resort development. The evaluation and hazard assessment, and the resulting recommendations provided in this plan address identified areas of fire protection and safety and indicate that fire analysis has been incorporated the Project’s newly Recirculated Draft Environmental Impact Report Hazards Section (RDEIRHS). The intent of this FPP is for the provided recommendations to become Project conditions of approval.

The Project, known as Paraiso Springs Resort, is located in unincorporated southern Monterey County in the western foothills of the Central Salinas Valley, approximately seven miles west of the City of Greenfield at the western terminus of Paraiso Springs Road. The project site consists of approximately 235 acres located in the entrance of Paraiso Springs Valley and Indian Valley and extending westward into the foothills between the crest of the Sierra de Salinas Foothills and the Salinas Valley. The site is bordered to the east by grazing and farmland and to the north, south and west by the Santa Lucia Mountains.

Fire related comments submitted to Monterey County pertaining to the Project’s DEIR include those from:

**LAFCO** – comments regarding fire response service levels, fire station necessity, and impact fees

**CAL FIRE** – defensible space details, addressing Public Resources Code (PRC) 4290 and 4291 application, vegetation management plan, reforestation plan details, need for Temporary Refuge Areas, excessive response time for structure fire response, access gate details and alternative access

**City of Soledad** – comments regarding fire service, impact fees, distance and fire response time

**LandWatch** – Project not consistent with PRC 4290 and County Code chapter 18.56, EIR recirculation to address fire hazards, revise project for consistency with fire protection in SRA, dead end road length and width less than 18 feet, Project will compromise its neighbors’ safety, on-site fire station, evacuation and shuttles, no evacuation plan, no significant impact determination, not consistent with Monterey County Code for dead end road length and d cannot meet same practical effect.

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2 California Public Resources Code (PRC) 4290 addresses building and infrastructure requirements in State Responsibility Areas (SRAs). PRC 4291 addresses defensible space requirements in SRA.
**California Attorney General** - Project has not adequately analyzed fire hazard and fire risk, DEIR failed to recognize that existing residents would be exposed to higher risk from building in a high fire sensitivity zone (sic), that there are new CEQA thresholds for wildfire that should be addressed, that the DEIR did not evaluate potential impacts on existing residents’ evacuation or the visitors and staff at the resort, lack of an evacuation plan (deferred mitigation), suggestion that the project should widen the entire Paraiso Springs Road, and that the DEIR should be revised to include updated emergency response data and construction of a fire station on site.

In summary, the comments primarily focus on requests for more details regarding the Project’s fire protection plan, fire response details, conformance with applicable codes and standards, evacuation plan, impacts to neighbors and generally, whether the Project has adequately considered the site and its visitors and staff safety. The technical analysis in this FPP provides additional details and assessment of the Project’s fire protection and safety and responds to the comments noted above. In addition, this report provides a summary of Dudek’s evaluation of the proposed project and its fire protection and recommendations for incorporation into the Project’s design and fire protection system.

**Project Information**

The Project site is located in Monterey County, California (Project Location; Figure 1) near Greenfield and Soledad. It is located approximately 5 miles west of Highway 101, 22 miles east of the Pacific Ocean, 7 miles southwest of Soledad, and 6.5 miles west/northwest of Greenfield. Specifically, the approximately 235-acre project site is located at the terminus of Paraiso Springs Road. The project site is located in a valley surrounded by foothills of the Sierra de Salinas Foothills. The Project site is disturbed having been a resort destination for well over 100 years but that has been unused in this capacity since 2003. Vegetation on the Project site includes disturbed landscapes of grassland, oak woodland, and sage scrub. The hills directly north, south and east of the site are undisturbed, including sage scrub, grassland, and oak trees. Land cover/uses to the northeast, east and southeast is dominated by agriculture, including vineyards. The existing terrain on the site is generally characterized as flat to gently sloping. Elevations at the project site range from approximately 1,000 feet above mean sea level (amsl) to 1,200 feet amsl. Slopes around the project site vary from up to approximately 2,000 feet to the south, 2,800 feet to the west, and 2,450 feet to the north.

The proposed Project includes redevelopment of the property into a variety of resort land uses including a hotel, timeshares, spa/fitness center, instructional training center, restaurants, and outdoor fields and gardens. Access to the site will be provided via Paraiso Springs Road. A staffed guard gate at the property’s entrance will control traffic entering and leaving the site. Paraiso Springs Road is the Project’s only access road and traverses through agriculture fields and natural vegetation near the Project, as illustrated in Figure 2.

The Project site is partially within a State Responsibility Area (SRA) and the majority of the development area is in the Mission Soledad Rural Fire Protection District (MSRFPD) and is planned to be annexed into MSRFPD jurisdiction, which would change the SRA to Local Responsibility Area (LRA). The site will remain a Very High Fire Hazard Severity Zone (VHFHSZ), as designated by CAL FIRE. Because of this designation, the Project would be required to be built to the latest ignition resistant building codes found in PRC 4290 and Chapter 7A of the California Building Code, as adopted by Monterey County, and any additional restrictions or requirements adopted locally by the MSRFPD.
Fire History

Fire history is an important component of wildfire analysis. Wildfire history information can provide an understanding of fire frequency, fire type, most vulnerable project areas, and significant ignition sources, amongst others. CAL FIRE’s Fire and Resource Assessment Program (FRAP) database was used to evaluate the Project’s fire history. FRAP summarizes fire perimeter data dating to the late 1800’s, but which is incomplete due to the fact that it includes only fires over 10 acres in size and has incomplete perimeter data, especially for the first half of the 20th century (Syphard and Keeley 2016). However, the data does provide a summary of recorded fires and can be used to show whether large fires have occurred in the project area, which indicates whether they may be possible in the future.

According to available data from CAL FIRE’s FRAP (CAL FIRE 2014), several wildfires have burned in the vicinity of the Project site since the beginning of the historical fire data record (Figure 3). These fires, burned within 5 miles of the Project site. While structural fires have occurred on site in the old resort buildings, no wildfires in the recorded history have burned onto the project site.

Project Understanding

The purpose of the technical analysis is to provide a fire hazard assessment and examine the proposed Paraiso Springs Resort, its consistency with the applicable code requirements, its potential impact to the fire response resources, and to prescribe additional fire protection measures/features, if justified. To complete this analysis, Dudek Fire Protection Planners visited the site and performed a fire environment assessment, evaluated the site plans, the existing roadways that would be used in an evacuation, and the planned fire protection measures. The analysis summarized herein is based on site conditions, project-related information including the Project’s RDEIRHS, comment letters, and available aerial images and site data.

Technical Analysis Methods

Dudek evaluated the project site and its consistency with applicable fire safety requirements. The following tasks were completed:

1. Conducted a site visit to analyze fuels, terrain, access, and other fire environment attributes
2. Reviewed provided site plans, comment letters, Recirculated Draft Environmental Impact Report Hazard Section (RDEIRHS), and applicable fire codes.
3. Conducted aerial image review of the site, access roads, and potentially available emergency egress routes.
4. Analyzed historical wind and weather data from remote automated weather stations (RAWS) using the FireFamily Plus software package.
5. Modeled potential fire behavior based on an assumed mature sage scrub and chaparral conditions using the BehavePlus fire behavior modeling software package. Fire behavior modeling outputs included those for surface fires (flame length, fireline intensity, fire spread rate, spotting distance).
6. Measured distances from the Project site to the nearest fire station and calculated response time.
7. Measured distances from the project site to various road intersections.
8. Reviewed PRC 4290 and 4291 and Monterey County Fire Code (Chapter 18.09 of Monterey County Code)
9. Documented unique circumstances, features, characteristics related to the project and how they support code modification findings.

10. Generated a FPP with recommended fire protection measures/features to enhance the existing plan

The following sections present our observations, analysis, findings, and recommendations regarding the Paraiso Springs Resort’s fire protection and overall wildfire safety.

Observations

Key Project Fire Safety Features

1. The Paraiso Springs Resort structural and infrastructural fire protection components will comply with the applicable code requirements, including the latest codes in place at the time of construction.

2. Structures will be of the latest ignition and ember resistant methods and materials including for:
   - Walls
   - Roofs
   - Eaves
   - Windows
   - Doors
   - Appendages

3. Structures will include fire sprinklers to occupancy requirements.

4. A Project condition prohibits solid fuels in outdoor fireplaces, barbeques, and grills.

5. Fuel Modification will be provided throughout the perimeter of the site and will at a minimum, meet the applicable 100 foot wide standard (Figure 4).

6. Landscaping would be maintained on an ongoing basis. This would assure that the use of highly flammable species is prohibited and that appropriate plant densities would be maintained. This would also reduce the impact of landscaping hanging into the roadways by reviewing size and location of trees and maintain 13-foot, 6-inch vertical clearance for fire apparatus.

7. Fire apparatus access roads will be provided throughout the facility and will be 20 to 24 feet wide, with no parking. Designated 12-foot wide circulation roads not open to visitor vehicle use will be designated for fire apparatus access to buildings beyond the area where 20 to 24 foot wide roads are provided.

8. Paraiso Springs Road will be improved, prior to the opening of phase 1 of the resort, to include 20 foot road widths for 98% of the 7,490 foot road and to 18 feet (based on terrain constraints) for the remaining 2% which equates to 150 foot of the 7,490 foot road to the Clark Road intersection. 

9. Water capacity and delivery improvements including upgraded storage (500,000 gallons) and pipe size provide for a reliable water source for operations and during emergencies requiring extended fire flow. Water availability and delivery is gravity fed and would provide for a reliable water source during daily and emergency usage.

10. Potential firefighting operations staging areas are available within the facility in developed areas and site green spaces.
Fire Behavior Modeling Analysis

An analysis utilizing BehavePlus fire behavior software\(^3\) was conducted to evaluate fire behavior variables and to objectively predict flame lengths, intensities, and spread rates for four modeling scenarios. These fire scenarios incorporated observed fuel types representing the dominant on-site and off-site vegetation on vacant land to the north, east, south, and west, in addition to measured slope gradients, and wind and fuel moisture values derived from RAWs weather data. Modeling scenario locations were selected to better understand different fire behavior that may be experienced on or adjacent to the site.

Weather:

Historical weather data for the region was utilized in determining appropriate fire behavior modeling inputs for the project site. For this analysis, 50th and 97th percentile fuel moisture and wind speed values were derived from Arroyo Seco RAWs\(^4\) data and utilized in the fire behavior modeling efforts conducted in support of this report. The Arroyo Seco RAWs is located at approximately 6.0miles south of the project site.

To determine weather-related modeling inputs, RAWs fuel moisture and wind speed data were processed utilizing the FireFamily Plus software. Data from the RAWs was evaluated from June 1 through November 30 for each year between 1961 and 2018. Data derived from this analysis included 1-hour, 10-hour, and 100-hour fuel moistures, live herbaceous moisture, live woody moisture, and 20-foot sustained wind speed. The 50\(^{th}\) and 97\(^{th}\) percentiles wind speed and fuel moisture data were used in the BehavePlus fire behavior modeling runs, as presented below.

Terrain:

Slope gradients for natural slopes range from 5\% to 60\%.

Fuels:

Vegetation types, which were derived from the Project’s RDEIRHS and field assessment, which was conducted on April 17, 2019, were classified into a fuel model. Fuel models are selected by their vegetation type; fuel stratum most likely to carry the fire; and depth and compactness of the fuels. Fire behavior modeling was conducted for vegetative types that surround the proposed development. Fuel models were selected from Standard Fire Behavior Fuel Models: a Comprehensive Set for Use with Rothermel’s Surface Fire Spread Model\(^5\). This value was used in the modeling analysis for the fuel type adjacent to the site. Fuel models were also assigned to the perimeter 100-foot wide fuel modification zones (FMZ) where existing vegetation would be removed of deadwood and thinned in addition to grasses to be cut in height as described in RDEIRHS. Based on the anticipated pre- and post-project


\(^4\) Arroyo Seco, California (NWS ID: 044301): Latitude: 36°13'48’’; Longitude: 121°29’30’’; Elevation 980 feet amsl

vegetation conditions, six different fuel models were used in the fire behavior modeling effort presented herein. Fuel model attributes are summarized in Table 1.

**Table 1. Fuel Model Characteristics**

<table>
<thead>
<tr>
<th>Fuel Model</th>
<th>Description</th>
<th>Location</th>
<th>Surface Fuel Bed Depth (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gr1</td>
<td>cut grasses (short, sparse, dry climate grass)</td>
<td>FMZ</td>
<td>&lt;0.5</td>
</tr>
<tr>
<td>Gr4</td>
<td>Annual Grassland (moderate load dry climate grass)</td>
<td>Valley bottoms</td>
<td>&lt;2.0</td>
</tr>
<tr>
<td>Gs2</td>
<td>Oak Woodland/Mixed Hardwood Forest (moderate load dry climate grass-shrub)</td>
<td>Drainages/north-facing slopes</td>
<td>&lt;15.0</td>
</tr>
<tr>
<td>Sh1</td>
<td>Minimum 50% thinning of brush (low load dry climate shrub)</td>
<td>FMZ</td>
<td>&lt;3.0</td>
</tr>
<tr>
<td>Sh2</td>
<td>Willow Riparian (moderate load dry climate shrub)</td>
<td>Eastern portion of site</td>
<td>&gt;6.0</td>
</tr>
<tr>
<td>Sh5</td>
<td>Diablan Sage Scrub (high load climate shrub)</td>
<td>Northern and western areas</td>
<td>&lt;4.0</td>
</tr>
<tr>
<td>Sh5</td>
<td>Baccharis Scrub (high load dry climate shrub)</td>
<td>Near riparian and eastern slopes</td>
<td>&lt;3.0</td>
</tr>
</tbody>
</table>

Table 2 summarizes the weather, terrain, and fuels variables used in the BehavePlus fire behavior modeling analysis.

**Table 2. BehavePlus Fire Behavior Modeling Inputs**

<table>
<thead>
<tr>
<th>Model Variable</th>
<th>50th Percentile Weather</th>
<th>97th Percentile Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 h fuel moisture</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>10 h fuel moisture</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>100 h fuel moisture</td>
<td>11%</td>
<td>7%</td>
</tr>
<tr>
<td>Live herbaceous moisture</td>
<td>42%</td>
<td>30%</td>
</tr>
<tr>
<td>Live woody moisture</td>
<td>84%</td>
<td>60%</td>
</tr>
<tr>
<td>20 ft. wind speed (miles per hour)</td>
<td>10 mph sustained winds high winds</td>
<td>19 mph sustained winds 50 mph peak gusts</td>
</tr>
<tr>
<td>Wind adjustment factor</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Terrain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Slope</td>
<td>20% to 60%</td>
<td>5% to 25%</td>
</tr>
</tbody>
</table>

**Fire Modeling Results**

The results of fire behavior modeling analysis for pre- and post-project conditions are presented in Tables 3 and 4, respectively. Identification of modeling run (fire scenarios) locations is presented graphically in Figure 5, BehavePlus Fire Behavior Analysis exhibit.
### Table 3. Paraiso Springs Resort BehavePlus Fire Behavior Model Results Existing Conditions

<table>
<thead>
<tr>
<th>Fire Scenarios</th>
<th>Flame Length (feet)</th>
<th>Fireline Intensity (BTU/feet/second)</th>
<th>Spread Rate (mph)</th>
<th>Spotting Distance (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenario 1: Slope - 5%, 97th Percentile Weather Conditions (Untreated Fuels)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Model Gr4</td>
<td>17.6 (33.3)</td>
<td>2,876 (11,569)</td>
<td>3.5 (14.0)</td>
<td>0.7 (2.0)</td>
</tr>
<tr>
<td>Fuel Model Gs2</td>
<td>9.9 (18.8)</td>
<td>837 (3,359)</td>
<td>0.95 (3.8)</td>
<td>0.4 (1.3)</td>
</tr>
<tr>
<td>Fuel Model Sh2</td>
<td>8.3 (15.1)</td>
<td>562 (2,077)</td>
<td>0.25 (0.93)</td>
<td>0.4 (1.1)</td>
</tr>
<tr>
<td><strong>Scenario 2: Slope - 25%, 97th Percentile Weather Conditions (Untreated Fuels)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Model Gr4</td>
<td>17.8 (33.4)</td>
<td>2,976 (11,667)</td>
<td>3.6 (14.1)</td>
<td>0.7 (2.0)</td>
</tr>
<tr>
<td>Fuel Model Gs2</td>
<td>10.1 (19.2)</td>
<td>867 (3,389)</td>
<td>1.0 (3.9)</td>
<td>0.4 (1.3)</td>
</tr>
<tr>
<td>Fuel Model Sh5</td>
<td>24.8 (41.4)</td>
<td>6.112 (18,553)</td>
<td>2.1 (6.3)</td>
<td>0.8 (2.3)</td>
</tr>
<tr>
<td><strong>Scenario 3: 20% to 46% slopes, 50th Percentile Weather Conditions (Untreated Fuels)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Model Gr4</td>
<td>9.5 (16.4)</td>
<td>765 (2,495)</td>
<td>1.1 (3.4)</td>
<td>0.3 (0.8)</td>
</tr>
<tr>
<td>Fuel Model Gs2</td>
<td>5.2 (8.8)</td>
<td>201 (649)</td>
<td>0.3 (0.9)</td>
<td>0.2 (0.5)</td>
</tr>
<tr>
<td>Fuel Model Sh5</td>
<td>15.3 (22.4)</td>
<td>2,141 (4,906)</td>
<td>1.0 (2.0)</td>
<td>0.5 (0.9)</td>
</tr>
<tr>
<td><strong>Scenario 4: 45% to 60% slopes, 50th Percentile Weather Conditions (Untreated Fuels)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Model Gs2</td>
<td>5.5 (8.8)</td>
<td>233 (649)</td>
<td>0.3 (0.9)</td>
<td>0.2 (0.5)</td>
</tr>
<tr>
<td>Fuel Model Sh5</td>
<td>14.4 (21.5)</td>
<td>1,857 (4,454)</td>
<td>0.7 (1.8)</td>
<td>0.4 (0.9)</td>
</tr>
</tbody>
</table>

**Note:**
1. It should be noted that the values in parenthesis represent worst-case wind speeds of 50 mph for scenarios 1 and 2 and 24 mph for scenarios 3 and 4.

### Table 4. Paraiso Springs Resort BehavePlus Fire Behavior Model Results Post Project Conditions

<table>
<thead>
<tr>
<th>Fire Scenario</th>
<th>Flame Length (feet)</th>
<th>Fireline Intensity (BTU/feet/second)</th>
<th>Spread Rate (mph)</th>
<th>Spotting Distance (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenario 1: Slope - 5%, 97th Percentile Weather Conditions (Fuel treatments)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Model Gr1</td>
<td>3.1 (3.1)</td>
<td>67 (67)</td>
<td>0.05 (0.5)</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>Fuel Model Sh1</td>
<td>5.5 (9.5)</td>
<td>227 (760)</td>
<td>0.4 (1.3)</td>
<td>0.3 (0.8)</td>
</tr>
<tr>
<td><strong>Scenario 2: Slope - 25%, 97th Percentile Weather Conditions (Fuel treatments)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Model Gr1</td>
<td>3.1 (3.1)</td>
<td>67 (67)</td>
<td>0.05 (0.5)</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>Fuel Model Sh1</td>
<td>5.5 (9.5)</td>
<td>235 (760)</td>
<td>0.4 (1.3)</td>
<td>0.3 (0.8)</td>
</tr>
<tr>
<td><strong>Scenario 3: 20% to 46% slopes, 50th Percentile Weather Conditions (Fuel treatments)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Model Gr1</td>
<td>2.1 (2.3)</td>
<td>29 (34)</td>
<td>0.23 (0.27)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Fuel Model Sh1</td>
<td>1.0 (1.0)</td>
<td>5.0 (5.0)</td>
<td>0.03 (0.03)</td>
<td>0.1 (0.1)</td>
</tr>
<tr>
<td><strong>Scenario 4: 45% to 60% slopes, 50th Percentile Weather Conditions (Fuel treatments)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Model Gr1</td>
<td>2.3 (2.3)</td>
<td>34 (34)</td>
<td>0.3 (0.3)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Fuel Model Sh1</td>
<td>1.0 (1.0)</td>
<td>5 (50)</td>
<td>0.03 (0.03)</td>
<td>0.1 (0.1)</td>
</tr>
</tbody>
</table>

**Note:**
1. It should be noted that the values in parenthesis represent worst-case wind speeds of 50 mph for scenarios 1 and 2 or 24 mph for scenarios 3 and 4.
The results presented in Tables 3 and 4 depict values based on inputs to the BehavePlus software and are not intended to capture changing fire behavior as it moves across a landscape. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis. For planning purposes, the averaged worst-case fire behavior is the most useful information for conservative fuel modification design. Model results should be used as a basis for planning only, as actual fire behavior for a given location would be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns.

Conclusion: As presented in Table 3, wildfire behavior in non-treated, grasses (Fuel Model Gr4), sage- baccharis scrub (Fuel Model Sh5), oak woodland/mixed hardwood forest (Fuel Model Gs2), and willow riparian (Fuel Model Sh2) vary based on timing of fire. A fire being fanned by 24 mph, onshore, downslope winds (fire scenarios 3 and 4) would result in a fire spreading in grasses-sage scrub fuel types at roughly 2.0 to 3.4 mph with up to 22.4 feet flame lengths (the flames would be more vertical due to the wind pushing them down the slope). During the fall when there are more likely extreme offshore winds and low fuel moistures, a wildfire in sage scrub-oak woodlands fuel types (fire scenarios 1 and 2) is expected to be moving up to 14.0 mph with highest flame length values reaching approximately 41.4 feet in eastern portions of the property (moving up-slope and flames laying more parallel to the slope). Maximum spotting distance for both onshore and offshore wind-driven fires is projected to occur between 0.9 and 2.3 miles, respectively, downwind.

As previously mentioned, Dudek conducted modeling of the site for post-fuel modification zones. Fuel modification includes removal of dead and dying shrubs and trees in addition to reducing the shrub canopy coverage by 50% and cutting grasses to less than 6-inches in height on the periphery of the project site, beginning at the structure. For modeling the post-FMZ treatment condition, the fuel model assignment for untreated fuels were re-classified according to the specific fuels management (e.g., cutting grasses vs. 50% thinned native brush) treatment.

As depicted in Table 4, the FMZ areas experience a significant reduction in flame length and intensity. The approximately 33-foot and 41-foot flame lengths predicted for grasses and sage-baccharis scrub fuel types during pre-treatment modeling for fire scenarios 1 and 2 are reduced to approximately 3.1 and 9.5 feet, respectively. During onshore weather conditions, a fire approaching from the west towards the development footprint would be reduced from 22-foot tall flames to less than 1.0-foot tall with low fire intensity and spotting distances due to the higher live and dead fuel moisture contents. These reduction of flame lengths and intensities are assumed to occur within the full 100 feet of fuel modification. Based on this analysis, the 100 foot wide FMZs are considered appropriate for providing defensible space, and protecting the site’s ignition resistant structures from direct flame impingement and radiant/convective heat from a wildfire.

Project Issue Analysis

The following analysis considers the key components of the Project’s fire protection and evacuation system. It is assumed that the Project’s structures will be ignition resistant because they will be built to the code requirements (Chapter 7A of the California Building Code) that were put in place to minimize the ability of embers to penetrate and cause ignition. Similarly, the site’s landscape will be ignition resistant and maintained in a condition that would not facilitate the spread of fire into the developed portions of the resort landscape. Water availability has been addressed and includes dedicated stored water, gravity flow, and hydrants throughout the site.
1. Road Capacity

Paraiso Springs Road is able to accommodate up to 2,000 vehicles per hour (Keith Higgins 2019)\(^6\). Dudek commonly utilizes 1,900 vehicles per hour per traffic lane based on several traffic engineers input on similar project evacuation studies. This means that the maximum number of vehicles that can be accommodated in a single lane per hour, assuming traffic flow is maintained, is approximately 1,900 vehicles, or about 32 vehicles per minute passing a given point. Accordingly, in an emergency that required evacuation of the Paraiso Springs Resort, all estimated 275 vehicles can be moved down to the intersection of Clark Road (a distance of 1.4 miles) in less than 10 minutes (actual “wheels rolling” time – which is the time when a vehicle leaves the resort gate and arrives at the Clark Road intersection). At 12 miles per hour, the travel time is approximately 5 minutes to reach Clark Road. The amount of time for vehicles to reach Paraiso Springs Road varies based on distance from the gate exiting to the road and distance to their vehicle onsite, and could require an additional 5 to 10 minutes on average, and a worst case buffer time of 30 minutes was used in Table 5 for some of the resort guests to assemble and exit the property.

As depicted in Table 5, it is understood that there can be delays, congestion, and slower movement of traffic that reduces the ability to reach the maximum hourly capacity. In this case, however, if the maximum capacity is reduced by 30\%, the Project evacuation travel time is less than 13 minutes and if it is reduced to 50\% (950 vehicles per hour), there would still be enough capacity to have all vehicles off-site in just over 17 minutes travel time. This is considered an acceptable “wheels rolling” evacuation time for the anticipated population. Traffic congestion is expected to be minimized as there are few driveway or heavily used intersections on Paraiso Springs Road (few vehicles to merge into evacuating vehicle procession). By the time the last vehicle left the project, vehicles leaving earlier would already be beyond the Clark Road intersection. Per Table 6, the traffic speeds needed to reach these travel times are considered reasonable during an evacuation with the highest speeds being approximately 12 mph (1,900 vehicles per hour) and the lowest speeds being a calculated 5 mph (950 vehicles per hour). Additionally, it would be possible to position minimal law enforcement or other emergency responders at Clark Road/Paraiso Springs Road and then downstream to keep traffic moving and avoid backups. Traffic is anticipated to be able to be moved steadily as there are at least three, and up to seven potential vehicle dispersion routes that are available off of both Paraiso Springs and Clark Roads.

### Table 5. Paraiso Springs Resort Evacuation Travel Time and Total Estimated Time

<table>
<thead>
<tr>
<th>Maximum Single Lane Capacity</th>
<th>Capacity Discount(^2)</th>
<th>Discounted Lane Capacity</th>
<th>Evacuating Vehicles ( )</th>
<th>Travel Time (to Clark Road)</th>
<th>Buffer Time(^3)</th>
<th>Total Estimated Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,900</td>
<td>0%</td>
<td>1,900</td>
<td>275</td>
<td>8 m, 42 s</td>
<td>30 min</td>
<td>&lt;40 m</td>
</tr>
<tr>
<td>1,900</td>
<td>30%</td>
<td>1,330</td>
<td>275</td>
<td>12 m, 24 s</td>
<td>30 min</td>
<td>&lt;45 m</td>
</tr>
<tr>
<td>1,900</td>
<td>50%</td>
<td>950</td>
<td>275</td>
<td>17 m, 22 s</td>
<td>30 min</td>
<td>&lt;50 m</td>
</tr>
</tbody>
</table>

\(^1\) Single lane maximum feasible capacity commonly used by traffic engineers.

\(^2\) Discounts are provided based on evacuation conditions that may result in slower vehicle movement.

\(^3\) Buffer time is 30 minutes to account for pre-evacuation preparations, mobilization, and responses, but actual additional time may be much shorter, in the 5 to 10 minute timeframe.

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Letter dated March 8, 2019 from Traffic Engineer Keith Higgins with review and input by Dudek to John Thompson, Paraiso Springs Resort, LLC. Subject – Project evacuation traffic analysis.
Table 6. Vehicle Speed by Road Capacity

<table>
<thead>
<tr>
<th>Lane Capacity</th>
<th>Vehicles per minute</th>
<th>Seconds per vehicle</th>
<th>Average Vehicle Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,900</td>
<td>31.6</td>
<td>1.9</td>
<td>&lt; 12 mph</td>
</tr>
<tr>
<td>1,330</td>
<td>22.2</td>
<td>2.7</td>
<td>&lt; 7 mph</td>
</tr>
<tr>
<td>950</td>
<td>15.8</td>
<td>3.8</td>
<td>&lt; 5 mph</td>
</tr>
</tbody>
</table>

**Conclusion:** Paraiso Springs Road and its connectors include significantly more capacity to move vehicles than would be utilized with the combined Paraiso Springs Project and existing resident and vineyard evacuation traffic. This capacity represents a buffer that can offset traffic congestion that may occur during an emergency evacuation and still maintain acceptable vehicle movement and evacuation times. The Project’s calculated fast evacuation can be contrasted with more densely populated areas where road congestion can continue for several hours or more.

2. **Off-site Road Improvements**

The Project would improve Paraiso Springs Road from the Project boundary to its intersection with Clark Road by increasing the currently 16 to 22 feet road widths prior to opening of the first phase to a minimum of 20 feet for the 98 percent of the road with one 150 foot exception due to terrain limitations. That area limited by terrain would still be widened to a minimum of 18 feet. Additional improvements would include the installation of safety signage, delineators and centerline striping. Road widening and related improvements are an important component of this Project’s Roadway Improvement Plan (Hatch Mott MacDonald, 2008) in terms of emergency vehicle access and visitor evacuation.

**Conclusion:** The off-site road improvements are considered very important for meeting the intent of the applicable fire codes and for creating an access road that minimizes pinch points that could negatively impact fire apparatus response or an evacuation. The planned widening to a minimum of 20 feet with a limited section of 18 feet in the exception area provides a minimum of two ten foot travel lanes for 98% of the road (with a small section of the road providing two 9 foot travel lanes) and would alleviate concerns related to emergency access and evacuation.

3. **Project Population Impact on Evacuation Traffic**

The project is proposing a daily population of approximately 500 people at full buildout with 100% occupancy, including staff and visitors. Dudek has utilized 2 persons per vehicle to estimate the additional number of vehicles that would be generated during an emergency, which is a common vehicle population used for evacuation calculations and is consistent with the planned parking spaces and shuttle capacity. Additionally, there may be Project vehicles and a shuttle that would be used in an evacuation. This results in a total of up to approximately 275 vehicles that may be leaving the site during a declared evacuation. The existing Paraiso Springs Road includes approximately 5 homes and a vineyard. The homes would be expected to generate roughly 11 vehicles (2.2 vehicles per home – Cal Poly San Luis Obispo study 2016) while the vineyard may include up to 5 vehicles during an evacuation.

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8 Developing a Planning tool for Evaluating Proposed Developments Accessible by Dead-End Roads. February 2016. W. David Conn, Principal Investigator, Cornelius K. Nuworsoo, Co-Principal Investigator, Christopher A. Dicus, Co-
evacuation. The evacuation of these existing residents, along with the Project’s population is anticipated to require less than 10 minutes travel time for the last vehicle to reach the Clark Road intersection. The actual travel time for the existing residents and vineyard workers would be less than 10 minutes due to their location closer to Clark Road, and is estimated at between 3 and 5 minutes. The vineyard workers’ evacuation travel time may be slightly longer since they are further up the road, but would still be anticipated to meet the approximately 10 minute timeframe. The Clark Road intersection is considered a point of lower risk because it is amongst the irrigated and maintained vineyards where wildfire exposure would be limited. Currently, the existing residents and vineyard workers would be anticipated to evacuate the area within 2 to 3 minutes travel time (Higgins 2019). During evacuations, it would be expected that existing residents would evacuate sooner and be at or beyond the Clark Road intersection before the resort traffic reached them since they are closer to the Clark Road intersection. This likely scenario would, in effect, maintain the current condition for the existing residents and vineyard workers. However, if for some reason the residents and vineyard workers evacuated the area concurrently with resort traffic, an additional 3 to 4 minutes timeframe may be incurred. This increase would be considered an insignificant impact as that evacuation time is considered acceptable. In addition, it is the intent of the Project as part of its emergency preparation plan, to place 2 evacuation managers at the two curves in Paraiso Springs Road during an emergency evacuation. One person would be placed at the intersection where 3 of the neighboring houses and the vineyard employees would exit onto Paraiso Springs Road and the other closer to the other 2 “downstream” houses. In the event that these residents and workers are not already evacuated and off Paraiso Springs Road (estimated 2 to 3 minutes travel) before the Project evacuates, this Project commitment would aid in maintaining traffic movement and as needed, assist with emergency vehicles heading toward the Project. This would also allow breaks in Project vehicles to allow the existing resident’s ability to merge onto the road and proceed toward the Clark Road intersection. The insignificant impact is further minimized by the Project’s benefits to the neighbors including: Paraiso Springs Road improvements, increased tax base that results in additional resources for fire protection, modified fire behavior as the Project presents a fuel break to the west of the existing residents, and the Project provides designated temporary refuge area if evacuation via Paraiso Springs Road is considered unsafe. The evacuation of Paraiso Springs Resort is aided by the short distance to areas of relative safety and the roadside protection the agricultural landscapes would provide.

**Conclusion:** The calculated evacuation travel time up to approximately 10 minutes to areas where exposure to wildfire would be limited is considered a good travel time for 500 persons on the project site and the local residents and vineyard workers. Again, this travel time estimate is considered a worst case because it would be expected that the local residents and vineyard workers would evacuate prior to incurring any resort traffic. Efforts aimed at education of staff and visitors regarding emergency procedures would facilitate evacuations and minimize the mobilization time for visitors to go to their vehicles, carpool, or shuttles. The addition of approximately 275 vehicles associated with the Project would be expected to potentially increase the evacuation time along Paraiso Springs Road for existing residents and vineyard workers, but would not be expected to adversely impact the ability to move people from the area in acceptable timeframes due to the finite population evacuating vs. an urban area where many more vehicles would be evacuating, extending travel times significantly.

Principal, Investigator, Kenneth C. Topping, Senior Advisor, Dan Turner, Senior Consultant. 81 pp. Refers to US Census average of vehicles per house.
4. Evacuation Contingency Plan

The proposed Project’s primary evacuation protocol is early evacuation according to the Paraiso Springs Resort Evacuation Plan in Attachment 1. However, the Project will include several buildings that would be acceptable as temporary refuge areas. Larger structures that would be built to the latest ignition resistant building requirements and provided maintained defensible space could be used by visitors, staff, and emergency responders to temporarily shelter during a wildfire and will be sized appropriately for each phase of development. The landscapes would be required to include a minimum of 100 feet of fuel modification/defensible space. Structures that are built to the latest requirements for very high fire hazard severity zones and are provided maintained defensible space perform very well during wildfires, as noted by numerous after action assessments (evaluations following wildfires of why homes were lost or saved). As such, it would be possible for persons at the resort to seek temporary refuge within these buildings if evacuation was considered unsafe. Emergency managers would have the flexibility to direct persons to these buildings to temporarily refuge if the evacuation roads were considered unusable during a late evacuation where the wildfire or other emergency has encroached upon the area. The first priority for these guests would be early evacuation, long before a wildfire threatened the area and its evacuation route. Temporarily seeking refuge in a protected building would be a contingency option, improving the emergency responders’ procedural flexibility and resort population safety. Because the Project’s population is transient, there would be no reason for anyone to stay and defend personal property, early evacuation is largely improved and would be mandatory per Attachment 1: Wildland Fire Evacuation Plan.

Conclusion: In addition to the evacuation route from the Project to various connector roads, the potential to temporarily refuge during a wildfire or other emergency provides a contingency option that increases overall safety by avoiding the limitation of relying only on evacuation during an emergency. The ability to temporarily refuge visitors, staff and firefighters on site would be available to emergency managers should evacuation via the available options be considered unsafe or less desirable.

5. Dead End Road Length Intent

In terms of the dead end road length allowances within Title 14 Fire Safe Regulations, Article 2, the original intent included minimizing the exposure of evacuating people and responding emergency personnel to wildfire conditions. This intent was seemingly based on conditions where readily available fuels were situated along the roadways and where buildings were built within the fuels (scattered homes/commercial buildings in a wildland urban intermix condition). These conditions partially exist along Paraiso Springs Road where approximately 1 mile of travel includes natural or unmaintained fuels along the roadside. Beyond that point, agricultural, primarily vineyard fields, occur and present a considerable fuel break with low potential for ignition and fire spread. These agricultural areas are considered an important component of the evacuation process from the project as once evacuees reach this point, the exposure risk is substantially reduced.

Conclusion: The project intends to comply with PRC 4290 for the proposed project parcel. Paraiso Springs Road is a county maintained road built in the 19th century and is not subject to PRC 4290 dead end road requirements per the California Board of Forestry and Fire Protection (Edith Hannigan, Land Use Program Manager, California Board of Forestry and Fire Protection – email to Mike Novo, Monterey County Planning, May 3, 2019). However, the project is mitigating for the single access road into the project site with road improvements for evacuation and emergency access vehicles as well as numerous on-site fire protection methods, thus achieving the same practical effect through the various recommendations/measures discussed herein as if PRC 4290 did apply to Paraiso Springs Road.
6. Emergency Response

MSRFPD fire station 37 is within 8.9 miles of the Paraiso Springs Resort. Station 37 has an estimated response travel time of slightly above 15 minutes, which assumes travel time to the project entrance and an adjusted speed based on the Insurance Services Office travel time formula. The 15’46” minute response travel time is substantially conforming with the 1982 Monterey County General Plan policy standard of 15 minutes and the additional 46 seconds can be largely offset by drive speed on open stretches of the response route. It should also be noted that the 2010 Monterey County General Plan policy standard for emergency response time for the proposed project would now be 45 minutes, almost three times the 1982 General Plan standard.

The existing fire stations currently respond to approximately 1,600 calls per year (4.4 calls per day), which would be considered approximately average in terms of call volume. For perspective, a busy urban fire station may run 15 or more calls per day and a busy rural fire station may run 7 calls per day (Hunt 2010)12. The existing service area includes approximately 34,000 residents. The per capita call volume is 0.047 calls per person per year, which equates to 47 calls per 1,000 population. The majority of these calls (estimated 80% or more) are medical emergencies. The Project would add approximately 500 persons which would result in an anticipated call volume increase of 24 calls per year. This estimate is considered overly conservative in that it combines all socio-economic and age group call generation totals and applies them to the Project, which would typically include a demographic that requires fewer calls. For example, the 379 room Portola Hotel and conference center in Monterey indicate that they average about 10 to 12 per year and the 93 room Quail Lodge resort and golf club average about 4 calls per year. Even using the Project’s conservative call number of 24, it equates to 0.07 calls per day or one call every 14 days.

Conclusion: The response travel time substantially conforms to the 1982 General Plan’s 15 minute timeframe from Fire Station 37. Rural areas are often afforded additional response time (much longer times than experienced within urban areas) due to the low density population, low call volumes, and the lack of sustainable, generated funding and justification to build more stations. Monterey County, in their 2010 General Plan acknowledges this by increasing standard response time guidelines three fold to 45 minutes. There are not enough calls generated to justify a station, therefore, jurisdictions often allow longer response times and the people living and working in these areas typically consider longer response times an acceptable trade off. The 1982 General Plan indicates that other on-site fire protections can be provided as mitigation for response exceeding 15 minutes as allowed by the General Plan policy. The site offers several measures that meet the General Plan’s focus on fire response. However, because most emergency calls at the Project site will be medical related and Resort clientele may expect fast response for medical emergencies, measures to provide advanced life support capabilities within 5 minutes (critical timeline for cardiac arrest and strokes) is considered worth exploring and is addressed in the following section. With regard to call volume, the project’s very conservatively calculated call volume would not be expected to impact the current response capabilities of the MSRFPD, with a conservatively calculated increase of the daily rate from 4.4 calls to less than 4.5 calls per day.

9 $T=0.65 + 1.7D$, where $T =$ time and $D =$ distance. This formula generally compensates for intersection deceleration and acceleration and does not include turnout time.

10 Monterey County updated their General Plan in 2010. The new policy S-6.5 allows for a response time of 45 minutes or less, 90% of the time in rural areas. The Project fully complies with the new response time goal.


12 Personal communication between Jim Hunt (Hunt Research Associates) and the author of this report, May 2010.
Findings – Hazard vs Risk

While the Proposed Project site resides in a designated VHFHSZ, it will have significantly lower potential of actual loss than other older communities/structures existing in MSRFPD. This reasoning is based upon the distinction between HAZARD (which the State categorizes) and RISK (which the State does not quantify). HAZARD is a property of the potential fire behavior (flame length, crown fire occurrence, capacity to generate embers) in the likely mature vegetation of a given area. RISK, however, is the potential for structural loss from said fire. Thus, even if there is potential low fire hazard in a given area (expected low flame lengths), a given structure might be at high risk of ignition if the physical characteristics of the property would facilitate structural ignition (e.g., flammable vegetation next to a home with wood siding or unprotected openings).

Conversely (and more appropriate to the Proposed Project), a structure might be in a high hazard area, but may actually be at low risk of ignition if the structure is built with ignition-resistant construction materials and methods and the adequate defensible space around and throughout the development is provided. This is especially true in planned communities and the Paraiso Springs Resort, where fuel modification can be provided over large areas and includes a perimeter zone.

We have confidence that the provided fire protection features along with the recommended measures discussed below would combine to enable the Fire Authority Having Jurisdiction to make findings that the Project provides appropriate fire protection for the site and its structures to be able to withstand the type of wildfires that may occur in the vicinity.

Conclusion

Dudek’s conclusion is consistent with that contained in the RDEIRHS for the project prepared by the County of Monterey. The Project’s design, location, access and construction will not expose the public to greater fire related hazard than other newly constructed buildings/communities located in a VHFHSZ and built to the required ignition resistance codes. The response time to the site is within the generally acceptable standards for rural development, the project roadway width will substantially meet the applicable requirements and with the roadway improvements to Paraiso Springs Road potential conflicts between outbound and inbound vehicles would be addressed, and the code enables single access with conditions/findings. The proposed development will be required to comply with the fire code in existence at the time of project construction including requirements for the use of fire resistant roofing and construction materials, provision of defensible space adjacent to structures, interior sprinklers, and significant water storage. Based on these facts, it is our conclusion that the construction and use of these premises will not create a public safety hazard.

Recommendations

The following fire protection and safety measures are recommended as conditions for development of the Paraiso Springs Resort. These measures were developed to directly address identified Project fire protection and safety issues.

1. A facility Fire Safety Coordinator(s) should be designated and would oversee implementation of fire protection and safety and overall fire coordination with MSRFPD/CAL FIRE.
2. The Fire Safety Coordinator(s) would coordinate an annual fire evacuation drill/fire exercise to ensure proper safety measures have been implemented, facility awareness and preparation of facility-wide “Ready, Set, Go!” plan, consistent with Monterey County Community Wildfire Protection Plan (2010)\(^\text{13}\).

3. Trained security staff 24/7, 365 days per year at the guard gate. The security staff should be trained to manage an evacuation of the facility by opening the gates and directing traffic out of the area.

4. Provide a first responder level staff person and equipment to be on-site at all times. This position may be the site’s security personnel or a cross-staffed position who is capable of providing advanced life support for medical emergencies.

5. Provide a customized one-ton, 4x4 pickup with a skid mounted pump and up to 150 gallon water tank. Multiple staff members and the site security staff should be trained to utilize this apparatus for the purposes of providing initial suppression for any vegetation ignitions, and initial response to other fires.

6. A designated structure (e.g., Hotel, Conference Center) will be selected to house the projected population and to include additional hardening to be designated a temporary refuge area (TRA): exterior glazing to be dual pane with both panes tempered glass, exceeding the code requirement. Primary TRA to include:
   - Large-panel television monitors discreetly located so those that are interested may track newscasts during a wildfire event
   - Wireless internet accessibility
   - Second utility source or U.L.-rated diesel generator for the designated TRA
   - Intercom system to maintain communications with Ranch administration
   - A copy of the Emergency Procedures Plan
   - Food and water provisions for up to 24 hours
   - Educational materials on emergency procedures and temporary sheltering during wildfire
   - Telephones (hard line)

7. All ventilation for the structures for the Project should require ember-resistant vents in addition to 1/8 screening. Require ember resistant O’Hagan or Brandguard vents (or tested equivalent) in all site buildings.

8. Provide a site-wide Public Address (PA) / Intercom system so that visitors and staff throughout the site (indoors and out) can be notified of an emergency quickly to facilitate efficient evacuations or contingency temporary refuging on site.

9. Prepare and practice site-wide evacuations following the “Ready, Set, Go!” program guidelines (Attachment 2). Include educational outreach regarding emergencies and the potential for evacuation or temporary refuging on site in designated buildings.

10. The Project’s Fire Safety Coordinator(s) would prepare an Emergency Preparation Plan that considers:
    - Pre-fire planning and preparations
    - Post-fire recovery actions
    - Reporting Emergency, Alerting Employees and Guests
    - Staff Training

\(^\text{13}\) Community Wildfire Protection Plan prepared by the Monterey Fire Safe Council to evaluate wildfire risk, identify hazard reduction efforts, detail a strategy and action plan, and educate the public on wildfire safety.
• Emergency Contact List of Key Personnel
• Building Identification
• Facility Protection Systems
• Increased Fire Prevention Efforts During High Fire Danger and Extreme High Fire Danger Periods
• Emergency Supplies
• Telephones/Communications/Technological resources (Twitter, Facebook, Web page, etc.)
• Media Communications
• Emergency Response Team Roles and Responsibilities
• Annual Review and Update
• Emergency Evacuation Procedures
• Temporary, On-Site Sheltering Procedures
• Scripted Emergency Notification Messages
• Guest Educational Materials on Emergency Procedures
• Participation in the Alert Monterey County – Emergency Notification System
• Emergency Decision Matrix
• Shuttle Bus on site day and night
• The updated EPP document should be reviewed by MSRFPD and local law enforcement agencies.

11. Only one, fully manned gate and no speed bumps or humps should be allowed in this project. This would allow traffic flow (ingress and/or egress) to move more rapidly in the case of emergency. The site entrance gate should be equipped with automatic opening device for fire and law enforcement at their discretion (e.g., Knox, click-to-enter, siren, or similar).

12. Fuel modification zones (minimum 100 feet wide) around designated temporary refuge area buildings should be restricted to highly ignition resistant vegetation planted at low densities and maintained free of all accumulated debris/litter.

13. A formal landscaping plan should be prepared and reviewed by MSRFPD and/or an experienced fire protection planner for the landscape plan’s consistency with accepted wildland urban interface fire safe/fire adapted practices.

14. If the vineyard is planted, a professional Vintner should be under contract at all times to manage the vineyard in an irrigated, maintained condition to act as a modified fuel buffer. The grape plants should be grown on trellises made of non-combustible material. The plants should be irrigated via drip irrigation to maintain a high moisture content, dead and dying plants or plant materials and debris should be removed from the area on an on-going basis. Should the vineyard operation ever be vacated or otherwise cease to operate, the area should be converted to irrigated turf or equivalent fuel modification zone consistent with the remaining irrigated FMZ throughout the resort.

15. An annual inspection of the site should be completed by MSRFPD or its designee at the Project’s expense to ensure that project landscaping is maintained in a wildfire-safe condition. The inspections would document out-of-compliance issues for abatement and follow up to confirm the abatement is completed.

16. Maintain a 1- to 3-foot landscape-free area adjacent to all building structures’ foundations. This would prevent available fuels for embers at the building base and flame impingement under the stucco along the weep screed and help prevent ember penetration into the structures’ with stucco walls.
Dudek anticipates that the provided fire protection features along with the additional fire protection enhancements described above would reduce likelihood of structure ignition, minimize fire spread potential through the site, and provide for an aware and ready staff and visitor population.

Limitations

This analysis and its fire protection recommendations are supported by fire science research, results from previous wildfire incidents, and fire agencies that have approved these concepts. However, this study does not provide a guarantee that all residents and visitors at the Paraiso Springs Resort will be safe at all times. There are many variables that may influence overall safety. This analysis provides recommendations based on proposed post-project conditions, anticipated evacuation scenarios, and currently available research. It is recommended that the owner(s) maintain a conservative approach to fire safety and evacuation. This approach must include maintaining fire safe landscape and structural components and evacuating early. The approach should also include a contingency option so that in the rare instance where it is determined by incident managers that it is unsafe to evacuate, seeking temporary refuge within hardened and protected buildings is a practiced contingency plan. Wildfire is a dynamic and somewhat unpredictable occurrence and it is important for anyone living in wildland urban interface areas to educate themselves on practices, including the Project’s Evacuation Plan and ongoing public outreach programs.

If you have any questions regarding this technical analysis, please contact me at 619.992.9161.

Sincerely,

Michael Huff
Principal/Senior Fire Protection Planner

Att.:  Figures 1–5
Attachment 1 – Wildland Fire Evacuation Plan
Attachment 2 – Ready, Set, Go! Action Plan
FIGURE 2
Site Plan
Fire Protection Technical Analysis—Paraiso Springs Resort

Legend
1. Main Entry Roadway
2. Hotel & Spa Entry Gateway
3. Existing specimen Oaks (typical)
4. Estate Lots Drive
5. Estate Lots - 1/3 acre (typical)
6. Vineyards
7. Hotel & Spa Entry Drive
8. Paraiso Institute
9. Themed Stone Bridge
10. Nursery Center & Display Gardens
11. Wine Pavilion
12. Hamlet entry Drive
13. Parking Meadow - Overflow Parking
14. Visitor’s Center
15. Enhanced on-site Treatment Center
16. Hamlet Arrival Plaza
17. Hamlet Town Square
18. Amphitheater Lawn
19. Amphitheater Pavilion & Stage
20. Day Spa Pools & Pavilions
21. Hotel Guest Parking
22. Spa & Hotel Arrival Bridge
23. Stone Pedestrian Arrival Bridge
24. Recirculating Ornamental Stream & Waterfalls
25. Guest Arrival Courtyard
26. Hotel Pergola Gardens & Overlook Terrace
27. Activity Terrace with Croquet & Bocce Courts
28. Conference Center Gardens & Terraces
29. Guestroom Casitas
30. Ornamental Therapy Stream & Swimming Pool
31. Service Drive
32. Hamlet Parking
33. Service Cart Path
34. Housekeeping Laundry & Mechanical
35. Spa Entry Courtyard Gardens
36. Teahouse
37. Spa Water Gardens
38. Spa Courtyard Garden (typical)
39. Labyrinth
40. Pedestrian Bridge to Spa Activity Center
41. Lap Pool
42. Vitality Pavilions (typical)
43. Vitality Courtyard Garden
44. Golf School
45. Practice Putting Greens
46. Racquetball Pavilion
47. Basketball Pavilion
48. Pathway to Hiking Center, Trailheads, & Naturist Areas
49. Hillside Village Condominiums
50. Streamside Pathway
51. Natural Solarium Area
52. Hiking Trails
53. Trailside Overlook

Exiting Well Locations
A. Well 1
B. Well 2
C. Soda Spring Well
D. Neighbor’s Spring Box
E. Unused Well

Source: Hill Glazer Architects 2005
### Fuel Model Characteristics

<table>
<thead>
<tr>
<th>Fuel Model</th>
<th>Description</th>
<th>Location</th>
<th>Surface Fuel Bed Depth (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gr1</td>
<td>out grasses</td>
<td>PMZ</td>
<td>~0.9</td>
</tr>
<tr>
<td>Gr4</td>
<td>Nixia Grasses</td>
<td>Valley bottoms</td>
<td>~2.0</td>
</tr>
<tr>
<td>E3</td>
<td>Oak Woodlands/Mixed Hardwood Forest</td>
<td>Dunes/rocks/north-facing slopes</td>
<td>~3.8</td>
</tr>
<tr>
<td>St1</td>
<td>Minimum 50%: Minning of brush</td>
<td>PMZ</td>
<td>~0.0</td>
</tr>
<tr>
<td>St2</td>
<td>Willow Riparian</td>
<td>Eastern portion of site</td>
<td>~2.0</td>
</tr>
<tr>
<td>St3</td>
<td>Desert Sage Scrub</td>
<td>Northern and western areas</td>
<td>~4.0</td>
</tr>
<tr>
<td>St5</td>
<td>Bosalhas Scrub</td>
<td>Near transfer and custom slopes</td>
<td>~3.0</td>
</tr>
</tbody>
</table>

---

**BehavePlus Fire Behavior Modeling Inputs**

- **Moist Variable**: 50th Percentile Weather / 95th Percentile Weather
  - **Fuel moisture**: 3%
  - **10-hour fuel moisture**: 11%
  - **Live herbaceous moisture**: 42%
  - **Live woody moisture**: 86%
  - **24-hour wind speed (MPH per hour)**: 24 MPH max, high winds, 50 MPH peak gusts
  - **Wind adjustment factor**: 0.4

---

**Paraiso Springs Resort BehavePlus Fire Behavior Model Results Existing Conditions**

<table>
<thead>
<tr>
<th>Fire Scenarios</th>
<th>Faire Length (feet)</th>
<th>Flame Intensity (Btu/ft/second)</th>
<th>Spot Rate (mg)</th>
<th>Spotting Distance (yards)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1: Average Natural Slope - 50%</td>
<td>17.6 (34.3)</td>
<td>2.876 (26.55)</td>
<td>0.9 (1.4)</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>Scenario 2: Average Natural Slope - 50%</td>
<td>18.3 (36.6)</td>
<td>2.876 (26.55)</td>
<td>0.9 (1.4)</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>Scenario 3: Average Natural Slope - 50%</td>
<td>24.8 (41.4)</td>
<td>6.112 (53.53)</td>
<td>2.1 (3.2)</td>
<td>0.8 (1.3)</td>
</tr>
<tr>
<td>Scenario 4: Average Natural Slope - 50%</td>
<td>9.0 (18.4)</td>
<td>765 (6.99)</td>
<td>1.1 (1.7)</td>
<td>0.3 (0.5)</td>
</tr>
<tr>
<td>Scenario 5: Average Natural Slope - 50%</td>
<td>6.2 (12.6)</td>
<td>318 (28.40)</td>
<td>0.3 (0.5)</td>
<td>0.3 (0.5)</td>
</tr>
<tr>
<td>Scenario 6: Average Natural Slope - 50%</td>
<td>15.3 (30.6)</td>
<td>2,141 (59.06)</td>
<td>1.0 (1.7)</td>
<td>0.5 (0.9)</td>
</tr>
</tbody>
</table>

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**Paraiso Springs Resort BehavePlus Fire Behavior Model Results Post Project Conditions**

<table>
<thead>
<tr>
<th>Fire Scenario</th>
<th>Faire Length (feet)</th>
<th>Flame Intensity (Btu/ft/second)</th>
<th>Spot Rate (mg)</th>
<th>Spotting Distance (yards)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1: Average Natural Slope - 50%</td>
<td>3.1 (5.5)</td>
<td>67 (9.7)</td>
<td>0.05 (0.1)</td>
<td>0.2 (0.4)</td>
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<tr>
<td>Scenario 2: Average Natural Slope - 50%</td>
<td>5.5 (9.8)</td>
<td>227 (34.9)</td>
<td>0.1 (0.3)</td>
<td>0.3 (0.5)</td>
</tr>
<tr>
<td>Scenario 3: Average Natural Slope - 50%</td>
<td>5.5 (9.8)</td>
<td>235 (36.5)</td>
<td>0.4 (0.7)</td>
<td>0.3 (0.5)</td>
</tr>
<tr>
<td>Scenario 4: Average Natural Slope - 50%</td>
<td>3.1 (5.5)</td>
<td>30 (4.3)</td>
<td>0.03 (0.06)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Scenario 5: Average Natural Slope - 50%</td>
<td>1.0 (1.6)</td>
<td>5.0 (5.9)</td>
<td>0.03 (0.06)</td>
<td>0.1 (0.2)</td>
</tr>
</tbody>
</table>

---

**Notes:**
- It should be noted that all values are in parentheses represent peak gusts of 50 MPH.

---

**FIGURE 5**

BehavePlus Fire Behavior Analysis Map

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1 EMERGENCY PRE-PLANNING - EVACUATION

1.1 Quick Reference - Wildland Fire Evacuation Plan

Evacuation is a process by which people are moved from a place where there is immediate or anticipated danger, to a safer place, and offered temporary shelter facilities. When the threat passes, evacuees are able to return to their normal activities, or to make suitable alternative arrangements.

Figure 1 indicates the Emergency Evacuation Routes available to the Paraiso Springs Resort. The exhibit highlights the community’s backbone interior roads along with primary access points and off-site roads and major traffic corridors leading to designated evacuation areas.

The available evacuation routes for the guests of Paraiso Springs Resort are (Figure 2):

1. **Egress to the east via Paraiso Springs Road** – This is the only Paraiso Springs Resort access road and interconnects with Clark Road and eventually Arroyo Seco Road to the East. Arroyo Seco Road to the south transitions to Thorne Road, which offers travel options to US-101 north or south, or continues south and eventually intersects with Elm Avenue. Arroyo Seco Road to the north offers travel options to US-101 north or south. US-101 north offers travel to Soledad and Salinas, while US-101 south offers travel to King City and Paso Robles.

2. **Egress to the south via Clark Road to Arroyo Seco Road secondary egress route** – This portion of Arroyo Seco Road continues south until it transitions into Elm Avenue, which provides travel options to the east, connecting with US-101 north or south. Turning right onto Central Avenue from Elm Avenue and continue southeast, the road will eventually connect with US-101 north or south.

3. **Egress to the north on Paraiso Springs Road** – This secondary evacuation route to the north on Paraiso Springs Road provides a route that connects with Foothill Road. Foothill Road continues north/northwest and transitions into River Road which parallels the Salinas River and US-101 north.

This evacuation plan has been prepared specifically for the Paraiso Springs Resort and focuses on wildland fire evacuations, although many of the concepts and protocols will be applicable to other emergency situations. Ultimately, this plan will be used by the Paraiso Springs Resort to educate their guests as to their evacuation approach during wildfires and other similar emergencies.

It is recognized that wildfire and other emergencies are often fluid events and that the need for evacuations are typically determined by 1) on-scene first responders, 2) a collaboration between first responders, law enforcement, and designated emergency response teams, including the Office
of Emergency Services and the Incident Command (IC) established for larger emergency events. As such, and consistent with all emergency evacuation plans, this Emergency Evacuation plan is to be considered a tool that supports existing pre-plans, as available for the area, and provides for citizens who are familiar with the evacuation protocol, but is subservient to emergency event-specific directives provided by agencies managing the event.

This Emergency Evacuation Plan should be reviewed by the Mission Soledad Rural Fire Protection District (MSRFPD), The County of Monterey, and Monterey County Sheriff’s Department. Provided input and edits will be integrated resulting in a coordinated effort and collaborative plan.

1.2 Background

The Paraiso Springs Resort Project site is located in Monterey County, California (Project Location; Figure 1) in the vicinity of Greenfield and Soledad. It is located approximately 5 miles west of Highway 101, 22 miles east of the Pacific Ocean, 7 miles southwest of Soledad, and 6.5 miles west/northwest of Greenfield. Specifically, the approximately 235-acre project site is located at the terminus of Paraiso Springs Road. The project site is located in a valley surrounded by foothills of the Sierra de Salinas Foothills. The Project site is disturbed having been a resort destination for well over 100 years but that has been unused in this capacity since 2003. Vegetation on the Project site includes disturbed landscapes of grassland, oak woodland, and sage scrub. The hills directly north, south and east of the site are undisturbed, including sage scrub, grassland, and oak trees. Land cover/uses to the northeast, east and southeast is dominated by agriculture, including vineyards.

This Paraiso Springs Resort Evacuation Plan has been prepared based on the Unified Monterey County Office of Emergency Services and Monterey County Emergency Operations Plan (EOP) – Annex P Transportation/Evacuation Plan. In order to establish a framework for implementing well-coordinated evacuations, the Monterey County Office of Emergency Services (OES) developed an Evacuation Annex as part of the Area EOP (Monterey County 2010). Large-scale evacuations are complex, multi-jurisdictional efforts that require coordination between many agencies and organizations. Emergency services and other public safety organizations play key roles in ensuring that an evacuation is effective, efficient, and safe.
Date: 5/1/2019  -  Last saved by: lterry  -  Path: Z:\Projects\J1176001\MAPDOC\MAPS\Evac Plan\Fig1_Project Location.mxd
INTERNTIALLY LEFT BLANK
FIGURE 2
Paraiso Springs Resorts Community Fire Evacuation Map
Wildland Fire Evacuation Plan for the Paraiso Springs Resort

- Evacuation Direction
- Major Transportation Corridor
- Primary Evacuation Route
- Secondary Evacuation Route
- Potential Temporary Roadside Refuge
- Project Site
- County Roads

Source: Basemap ESRI
Date: 5/2/2019 - Last saved by: lterry - Path: Z:\Projects\J1176001\MAPDOC\MAPS\Evac Plan\Fig 2 Fire Evac.mxd

Paraiso Springs Resort Project Site

TO SALINAS

TO KING CITY AND PASO ROBLES

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Evacuation during a wildfire is not necessarily directed by the fire agency, except in specific areas where fire personnel may enact evacuations on-scene. The Monterey County Sheriff’s Department (MCSD), California Highway Patrol, and other cooperating law enforcement agencies have primary responsibility for evacuations in the field and take direction from the fire and other agencies managing the event. These agencies work closely within the Unified Incident Command System, with the County OES, and responding fire department personnel who assess fire behavior and spread, which should ultimately guide evacuation decisions. To that end, MSRFPD, CAL FIRE, City Fire, law enforcement, Public Works, Planning, Emergency Services Departments, and CalTrans, amongst others, have worked with a County Pre-Fire Mitigation Task Force to address wildland fire evacuation planning for Monterey County.

It is important to note that every evacuation scenario will include some level of unique challenges, constraints, and fluid conditions that require interpretation, fast decision making, and alternatives. Risk is considered high when evacuees are evacuating late, and fire encroachment is imminent. This hypothetical scenario highlights the importance of continuing to train responding agencies, model various scenarios, educate the public, and take a very conservative approach to evacuation decision timelines (early evacuation) as well as providing contingency plans.

Equally as important, the evacuation procedures should be regularly updated with lessons learned from actual evacuation events, as they were following the 2008, 2015 and 2016 Monterey County fires. The authors of this Evacuation Plan recommend that occasional updates are provided, especially following lessons learned from actual incidents, as new technologies become available that would aid in the evacuation process, and as changing landscapes and development patterns occur within and adjacent the Paraiso Springs Resort Project that may impact how evacuation is accomplished. At the time of this plan’s preparation, there was no encompassing emergency evacuation plan available for the greater region. This Paraiso Springs Resort Wildland Fire Evacuation Plan is consistent with County evacuation planning and can be integrated into a regional evacuation plan when and if the area officials and stakeholders (MSRFPD, CAL FIRE, City of Monterey Fire Department, Monterey County Regional Fire District, Office of Emergency Services, Monterey County Sheriff’s Department, and others) complete one.

As demonstrated during large and localized evacuations occurring throughout California over the last 15 years, an important component to successful evacuation is early assessment of the situation and early notification via managed evacuation declarations. Monterey County utilizes early warning and informational programs to help meet these important factors. Among the methods available to citizens for emergency information are phone (via text messaging), radio, television, social media/internet, neighborhood patrol car PA notifications, and Reverse 911.
The Paraiso Springs Resort guests will be strongly encouraged to register with Reverse 911, Alert Monterey County, and the Monterey County Nixle Notification System. In addition, the resort will organize evacuation public outreach as well as maintain a fire safe page on the Resort’s Web page, including key sections of this Emergency Evacuation Plan and the Modified FPP and links to important citizen preparedness information.

### 1.3 Monterey County Evacuation Planning Summary

This Wildland Fire Evacuation Plan incorporates concepts and protocols practiced throughout Monterey County. The Monterey County Transportation/Evacuation Annex (2010) follows basic protocols set forth in the County’s Operation Area Emergency Operations Plan and the California Master Mutual Aid Agreement, which dictate who is responsible for an evacuation effort and how regional resources will be requested and coordinated.

First responders are responsible for determining initial protective actions before EOCs and emergency management personnel have an opportunity to convene and gain situational awareness. Initial protective actions are communicated to local EOCs and necessary support agencies as soon as possible to ensure an effective, coordinated evacuation.

During an evacuation effort, the designated County Evacuation Coordinator is the Sheriff, who is also the Law Enforcement Coordinator. The Evacuation Coordinator will be assisted by other law enforcement and support agencies. Law enforcement agencies, highway/road/street departments, and public and private transportation providers will conduct evacuation operations. Procurement, regulation, and allocation of resources will be accomplished by those designated. Evacuation operations will be conducted by the following agencies:

- Monterey County Sheriff’s Department
- Fire and Rescue
- County Health and Human Services Agency
- Department of Animal Services
- Department of Planning and Land Use
- Department of Environmental Health
- Department of General Services
- Department of Public Works
- Department of Agriculture, Weights, and Measures
- Department of Parks and Recreation
1.4 Paraiso Springs Resort Evacuation Road Network

Wildfire emergencies that would be most likely to include an evacuation of Paraiso Springs Resort would be large wildfires approaching from the north, south, east or west. These fires are often wind driven and occur during declared Red Flag Warning days where low humidity and high winds facilitate fire ignition and spread. If a fire starts in the open fields and pastures to the east of the Project or in the mountains to the north, west or south of the Project and are fanned by these fire weather conditions, an early evacuation of the area may occur as many as 24 or more hours prior to actual threatening conditions, depending on the location of the ignition. Fires occurring on typical weather days, even fires igniting off the local highways, have been very successfully controlled at small sizes within minutes of ignition and would not typically trigger a need to evacuate the project. Partial evacuation or temporary relocation of some neighborhoods could be an option in these cases.

If a wildfire ignited closer to the Paraiso Springs Resort during weather that facilitates fire spread, where multiple hours are not available for evacuation, a different evacuation approach would need to be explored. It is preferred to evacuate long before a wildfire is near, and in fact, history indicates that most human fatalities from wildfires are due to late evacuations when they are overtaken on roads. Therefore, it is prudent to consider a contingency option. For example, if a wildfire is anticipated to encroach upon the community in a timeframe that is shorter than would be required to evacuate all resort guests, then options available to responding fire and law enforcement personnel should include 1) temporary refuge where guests and staff of the resort are directed to other large buildings on the property that would be built to the latest ignition resistant building requirements and provide maintained defensible space and instructed to remain in these buildings while firefighters perform their wildland fire and structure protection functions. Although not officially designated a “shelter in place” site, the structures and landscape at the Paraiso Springs Resort provides the same features of shelter in place facilities, particularly they are ignition resistant, defensible and designed to require minimal resources for protection, which enables these contingency options that may not be available to other nearby structures and residences.

The roads that will be used for ingress and egress from the Paraiso Springs Resort are described as:

- **Paraiso Springs Road** – provides primary access to Paraiso Springs Resort. Prior to the opening of phase one of the resort, the road will be improved to provide for a 20 foot road width for 98 percent of the road and a minimum of 18 foot in the remaining 150 feet of road that is limited by terrain thus providing two 10 foot travel lanes in each direction for almost all of the road and a minimum of two nine-foot travel lanes in each direction for the small section of road that will be 18 ft. wide. Paraiso Springs Road intersects Clark Road, an 18-
foot wide, approximately 1.35 mile paved stretch of road with dirt shoulders, providing a minimum of two nine-foot travel lanes in each direction that connects Paraiso Springs Road to Arroyo Seco Road.

- **Arroyo Seco Road** (via Clark Road) – Arroyo Seco Road will provide primary emergency access to the north and south and will provide two approximately 10 foot wide unobstructed travel lanes that connect to US-101 to the north. Arroyo Seco Road intersects with Elm Avenue to the south which provides access to the US-101 to the east.

The need for evacuation plans, pre-planning, and tiered or targeted and staggered evacuations is important for improving evacuation effectiveness. Among the most important factors for successful evacuations in urban settings is control of intersections downstream of the evacuation area. If intersections are controlled by law enforcement, barricades, signal control, or other means, potential backups and slowed evacuations can be minimized. For the Paraiso Springs Resort project, there are few intersections and a low number of vehicles evacuating which does not conform to urban population evacuations which can be more complex.

Consistent with Monterey County transportation and evacuation annex (2010), major ground transportation corridors in the area will be used as primary evacuation routes during an evacuation effort. The road systems were evaluated to determine the best routes for fire response equipment and “probable” evacuation routes for relocating people to designated safety areas. The primary roadways that would be used for evacuation from Paraiso Springs Resort are Paraiso Springs Road, Clark Road, Arroyo Seco Road, Thorne Road, Elm Avenue, Central Avenue, Foothill Road, and Colony Road. These roads provide access to a major traffic corridor including U.S. Route 101 (US-101) to the east.

During an emergency evacuation from the Paraiso Springs Resort, the primary roadways may be providing citizen egress while responding emergency vehicles are inbound. The resort’s primary evacuation route intersects with the primary ingress/egress roads that intersect off-site primary and major evacuation routes.

If there is an emergency requiring evacuation, all guests and staff traffic would exit the project to the east via Paraiso Springs Road which is the only road to and from the resort. In a typical evacuation that allows time, all traffic will be directed to the east and out Paraiso Springs Road.

### 1.4.1 Evacuation Route Determination

Fire and law enforcement official will identify evacuation points before evacuation routes are announced to the public. Evacuation routes are determined based on the location and extent of the incident and include as many pre-designated transportation routes as possible. Absent direction
from fire and/or law enforcement officials, residents would be advised to use the primary access road – Paraiso Springs Road for evacuations.

1.4.2 Roadway Capacities and Maximum Evacuation Time Estimate

Roadway capacity represents the maximum number of vehicles that can reasonably be accommodated on a road. Roadway capacity is typically measured in vehicles per hour and can fluctuate based on the number of available lanes, number of traffic signals, construction activity, accidents, and obstructions as well as positive effects from traffic control measures.

Each roadway classification has a different capacity based on level of service, with freeways and highways having the highest capacities. Based on traffic engineer estimates (Keith Higgins 2019), and using peak numbers and a conservative estimate, roads that would be the most likely available to Paraiso Springs Resort guests and their hourly capacities are:

1. **Paraiso Springs Road** – 1,900 vehicles/hour

Using this average, the length of time it will take for an area to evacuate can be determined by dividing the number of vehicles that need to evacuate by the total roadway capacity. Paraiso Spring Resort will have an estimated 500 people at full buildout with 100 percent occupancy, including staff and resort guests. Dudek utilized 2 persons per vehicle to estimate the additional number of vehicles that would be generated during an emergency, which is a common vehicle population used for evacuation calculations and is generally consistent with the project planned parking spaces and shuttle capacity as estimated in the project traffic analysis report. Specifically, the highest employee shift count for the day shift was used to estimate personnel onsite and would equate to 98 onsite employees, leaving approximately 400 guests onsite at full buildout. Approximately 10 of the employees (10 percent) are management employees and would drive their own vehicles to the site which equates to approximately 10 management cars onsite. One shuttle bus would be onsite at all times to shuttle employees and resort guests from the property that did not drive their own vehicles to the Paraiso Springs Resort. Approximately 6.25 percent of the guests (approximately 25 people) would use the shuttle to get to the resort. Additionally, there would be approximately 5 to 8 vehicles and/or utility vehicles on the property at all times used for internal maintenance activities. This results in a total of up to approximately 269 vehicles that may be leaving the site during a declared evacuation compared to the Dudek estimate of 275 vehicles which would leave the site which is a slightly more conservative estimate. The existing Paraiso Springs Road includes approximately 5 homes and a vineyard. The homes would be expected to generate roughly 10 vehicles (2 vehicles per home - Cal Poly San Luis Obispo study 2016) 1 while the vineyard may include up to 5 vehicles during an evacuation. The evacuation of these existing residents and vineyard workers, along with the Project’s population is anticipated to require up to
10 minutes travel time for the last vehicle to reach the Clark Road intersection. The actual travel time for the existing residents and vineyard workers would be less than 10 minutes due to their location, and is estimated at between 5 and 7 minutes. These evacuation times are considered good as most wildfire events would enable longer timeframes for a fire threatened the site or its evacuation roads.

In the above scenario, there would be approximately 100 people (non-management employees and guests who were shuttled to the site) left to use the onsite shuttle bus and other evacuation vehicles. It’s estimated that a single shuttle could hold up to 35 or 40 people and the management employees could carpool up to 4 additional employees off the property per vehicle, giving the ability between the shuttle and management employees to evacuate up to 80 people in one trip out of the 100 resort guests/employees. This leaves approximately 20 employees that would be the last to exit the property after insuring that all evacuees were safely off the property; these remaining 20 employees would be directed to evacuate using any of the 5 to 8 onsite work vehicles that would be maintained on the property at all times. It is also reasonable to expect that if necessary, resort guests could be directed to assist in the evacuation process and would allow other guests to carpool offsite (Higgins 2019).

The Clark Road intersection is considered a point of lower risk because it is amongst the irrigated and maintained vineyards where wildfire exposure would be limited. During evacuations, it would be expected that existing residents would evacuate sooner and be at or beyond the Clark Road intersection before the resort traffic reached them since they are closer to the Clark Road intersection. This likely scenario would, in effect, maintain the current condition for the existing residents and vineyard workers. However, if for some reason the residents and vineyard workers evacuated the area concurrently with resort traffic, an additional 3 to 4 minutes timeframe may be incurred. This increase would be considered an insignificant impact as that evacuation time is considered acceptable. In addition, it is the intent of the Project as part of its emergency preparation plan, to place 2 evacuation managers at the two curves in Paraiso Springs Road during an emergency evacuation. One person would be placed at the intersection where 3 of the neighboring houses and the vineyard employees would exit onto Paraiso Springs Road and the other closer to the other 2 “downstream” houses. In the event that these residents and workers are not already evacuated and off Paraiso Springs Road (estimated 2 to 3 minutes travel) before the Project evacuates, this Project commitment would aid in maintaining traffic movement and as needed, assist with emergency vehicles heading toward the Project. This would also allow breaks in Project vehicles to allow the existing resident’s ability to merge onto the road and proceed toward the Clark Road intersection. The insignificant impact is further minimized by the Project’s benefits to the neighbors including: Paraiso Springs Road improvements, increased tax base that results in additional resources for fire protection, modified fire behavior as the Project presents a fuel break to the west of the existing residents, and the Project provides a designated temporary
refuge area if evacuation via Paraiso Springs Road is considered unsafe. The evacuation of Paraiso Springs Resort is aided by the short distance to areas of relative safety and the roadside protection the agricultural landscapes would provide.

1.5 Fire/Evacuation Awareness

The Paraiso Springs Resort will be active in its outreach to guests regarding fire safety and general evacuation procedures. There are aspects of fire safety and evacuation that require a significant level of awareness by the guests, staff and emergency services in order to reduce and/or avoid problems with an effective evacuation. Mitigating potential impediments to successful evacuations requires focused and repeated information through a strong educational outreach program. The Paraiso Springs Resort will engage the guests and staff and coordinate with local fire agencies for fire safety awareness through a variety of methods.

This FPP and evacuation plan will be accessible to all visitors and staff members within the resort and on the resorts Website. The resort will work with local fire agencies to hold an annual fire safety and evacuation preparedness informational meeting. The meeting will be attended by representatives of the fire agencies and important fire and evacuation information reviewed. One focus of these meetings and of the resort’s annual message will be on the importance of each visitor and staff member to prepare and be familiar with the “Ready, Set, Go!” evacuation plan. The “Ready, Set, Go!” program is defined at: http://wildlandfirersg.org/.

The focus of the “Ready, Set, Go!” program is on public awareness and preparedness, especially for those living in the wildland-urban interface (WUI) areas. The program is designed to incorporate the local fire protection agency as part of the training and education process in order to insure that evacuation preparedness information is disseminated to those subject to the potential impact from a wildfire. There are three components to the program:

“READY” – Preparing for the Fire Threat: Take personal responsibility and prepare long before the threat of a wildfire so you and your home are ready when a wildfire occurs. Create defensible space by clearing brush away from the resort as detailed in this FPP (Dudek 2019). Use only fire-resistant landscaping and maintain the ignition resistance of all structures within the resort. Assemble emergency supplies and belongings in a safe spot. Confirm you are registered for Reverse 911, AlertMontereyCounty, and Community Alert System. Make sure all guests staying at the resort understand the plan, procedures and escape routes.

“SET” – Situational Awareness When a Fire Starts: If a wildfire occurs and there is potential for it to threaten the Paraiso Springs Resort, pack your vehicle with your emergency items. Stay
aware of the latest news from local media and your local fire department for updated information on the fire. If you are uncomfortable, leave the area.

“GO!” – Leave Early! Following your Action Plan provides you with knowledge of the situation and how you will approach evacuation. Leaving early, well before a wildfire is threatening your community, provides you with the least delay and results in a situation where, if a majority of neighbors also leave early, firefighters are now able to better maneuver, protect and defend structures, evacuate other residents who couldn’t leave early, and focus on citizen safety.

“READY! SET! GO!” is predicated on the fact that being unprepared and attempting to flee an impending fire late (such as when the fire is physically close to the community) is dangerous and exacerbates an already confusing situation. This Paraiso Springs Resort Wildland Fire Evacuation Plan provides key information that can be integrated into the individual Action Plans, including the best available routes for them to use in the event of an emergency evacuation.

Situation awareness requires a reliable information source. One of the most effective public notification methods is Reverse 911. The Monterey County Office of Emergency Services operates the reverse 911 notification system that provides a recorded message over land line telephone systems relating to evacuation notices. In addition, the Office of Emergency Services operates a program known as “Alert Monterey County” that has the capability to send emergency notifications over both land lines as well as to cell phones and via text messages. It is up to individual residents to register their cell phones for “Alert Monterey County”. The registration of cell phones can be done on line at http://www.alertmontereycounty.org/.

In addition, Monterey County provides a separate Community Notification System which allows people to register to receive email or text message notifications about urgent or other information, including events that may result in traffic delays or road closures. Anyone can subscribe at http://www.nixle.com/ and selecting “Residents” and “Sign up” This system is not affiliated with the Monterey County Reverse 9-1-1 system and is informational only. It will not be used to issue an evacuation order.

As part of the Paraiso Springs Resort fire awareness and evacuation readiness program, information will be delivered in a variety of methods. The Resort will be responsible to provide and distribute to each guest and staff member a complete copy of the project’s Fire Protection Plan and this Wildland Fire Evacuation Plan, including materials from the READY! SET! GO! Program. The Resort is also responsible for insuring the distribution of copies of the aforementioned materials throughout the Resort.
As part of the approval of this project, it shall be binding on the Resort to actively participate as a partner with the MSRFPD, CAL FIRE, City Fire, and the local FireSafe Council (Monterey County Firesafe Council) and to assist with the coordination and distribution of fire safety information they develop.

1.6 Paraiso Springs Resort Evacuation Procedures

It is estimated that the minimum amount of time needed to move the Paraiso Springs Resort population to urbanized and/or designated evacuation areas may require approximately 10 minutes to just over 17 minutes, on average, under varying constraints that may occur during an evacuation.

Wildfire emergency response procedures will vary depending on the type of wildfire and the available time in which decision makers (Incident Command, MSRFPD, CAL FIRE, City Fire, MCSD, and/or County Office of Emergency Management) can assess the situation and determine the best course of action. Based on the community, it’s road network, and the related fire environment, the primary type of evacuation envisioned is an orderly, pre-planned evacuation process where people are evacuated from the Paraiso Springs Resort to more urban areas further from an encroaching wildfire (likely to urban areas east and southeast) well before fire threatens. This type of evacuation must include a conservative approach to evacuating, i.e., when ignitions occur and weather is such that fires may spread rapidly, evacuations should be triggered on a conservative threshold that includes time allowances for unforeseen, but possible, events that would slow the evacuation process.

Evacuation is considered by many to offer the highest level of life protection to the public, but it can result in evacuees being placed in harm’s way if the time available for evacuation is insufficient (Cova et al. 2011). An example of this type of evacuation which is highly undesirable from a public safety perspective, is an evacuation that occurs when fire ignites close to vulnerable communities. Paraiso Springs Resort would not be considered a vulnerable community, however, there are vulnerable communities within the region. This type of situation is inherently dangerous because there is generally a higher threat to persons who are in a vehicle on a road when fire is burning in the immediate area than in a well-defended, ignition resistant home or designated building. Conditions may become so poor, that the vehicle drives off the road or crashes into another vehicle, and flames and heat overcome the occupants. A vehicle offers little shelter from a wildfire if the vehicle is situated near burning vegetation or catches fire itself. This type of evacuation must be considered a very undesirable situation by law and fire officials in all but the rarest situations where late evacuation may be safer than seeking temporary refuge in a structure (such as when there are no nearby structures, the structure(s) is/are already on fire, or when there is no other form of refuge).
The third potential type of evacuation is a hybrid of the first two. In cases where evacuation is in process and changing conditions result in a situation that is considered unsafe to continue evacuation, it may be advisable to direct evacuees to pre-planned temporary refuge locations, including several structures within the Paraiso Springs Resort built with the latest ignition resistant construction and defensible space. The evacuation pre-planning must consider these potential scenarios and prepare decision makers at the IC level and at the field level for enacting a contingency to evacuation when conditions dictate.

Indications from past fires and related evacuations, in Monterey County and throughout Northern California, which have experienced increasingly more frequent and larger fires, are that evacuations are largely successful, even with a generally unprepared populace. It then stands to reason that an informed and prepared populace would minimize the potential evacuation issues and related risk to levels considered acceptable from a community perspective.

1.6.1 Paraiso Springs Resort Evacuation Baseline

For purposes of this Evacuation Plan, the first and most logical choice for all of the staff members and guests within the boundaries of the Paraiso Springs Resort is to adhere to the principals and practices of the “READY! SET! GO!” Program previously mentioned in this document. In addition, it is imperative that the “READY! SET! GO!” Program information is reviewed by resort guests, along with the accompanying maps illustrating evacuation routes, temporary evacuation points and pre-identified evacuation points.

Guests and staff members are urged to evacuate as soon as they are notified to do so or earlier if they feel uncomfortable. Evacuation directions will be provided, Paraiso Springs Resort guests will proceed accordingly, to available routes away from the encroaching fire. Depending on the type of emergency and the resulting evacuation, it could take as long as 17 minutes to reach Clark Road, at which point evacuation options are available and surrounding land uses are less vulnerable to wildfire.

Note: this evacuation plan will require adjustment and continued coordination by the Paraiso Springs Resort Fire Safety Coordinator(s) and/or developer and Fire/Law enforcement agencies during each of the construction phases. With each phase, the evacuation routes on site may be subject to changes with the addition of both primary and secondary evacuation routes.

1.6.2 Civilian and Firefighter Evacuation Contingency

As of this document’s preparation, no community in California has been directed to shelter in place during a wildland fire, however, shelter in place has been used for populations at college campuses and elsewhere. Even the communities in Rancho Santa Fe, California which are designed and
touted as shelter in place communities, were evacuated during the 2007 Witch Creek Fire. This is not to say that people have not successfully sheltered in place during wildfire, where there are numerous examples of people sheltering in their homes, in hardened structures, in community buildings, in swimming pools, and in cleared or ignition resistant landscape open air areas. The preference will likely always be early evacuation following the “Ready, Set, Go!” model, but there exists the potential for unforeseen civilian evacuation issues, and having a contingency plan will provide direction in these situations that may result in saved lives. Potential problems during wildfire evacuation from the Paraiso Springs Resort include:

- Fires that prevent safe passage along planned evacuation routes
- Inadequate time to safely evacuate
- Blocked traffic due to accidents or fallen tree(s) or power pole(s)
- The need to move individuals who are unable to evacuate

It is recommended that a concerted pre-planning effort focus on evacuation contingency planning for civilian populations when it is considered safer to temporary seek a safer refuge than evacuation.

1.6.2.1 Safety Zones

The International Fire Service Training Association (IFTSA; Fundamentals of Wildland Fire Fighting, 3rd Edition) defines Safety Zones as areas mostly devoid of fuel, which are large enough to assure that flames and/or dangerous levels of radiant heat will not reach the firefighting personnel occupying them. Areas of bare ground, burned over areas, paved areas, and bodies of water can all be used as safety zones. The size of the area needed for a safety zone is determined by fuel types, its location on slopes and its relation to topographic features (chutes and saddles) as well as observed fire behavior. Safety zones should never be located in topographic saddles, chutes or gullies. High winds, steep slopes or heavy fuel loads may increase the area needed for a Safety Zone.

The National Wildland Fire Coordinating Groups (NWFCG), Glossary of Wildland Fire Terminology provides the following definitions for Safety Zone and Escape routes

Safety Zone. An area cleared of flammable materials used for escape in the event the line is outflanked or in case a spot fire causes fuels outside the control line to render the line unsafe. In firing operations, crews progress so as to maintain a safety zone close at hand allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuel breaks;
they are greatly enlarged areas which can be used with relative safety by firefighters and their equipment in the event of blowup in the vicinity.

According to NWFCG, Safety Zone(s):

- Must be survivable without a fire shelter
- Can include moving back into a clean burn
- May take advantage of natural features (rock areas, water, meadows)
- Can include Constructed sites (clear-cuts, roads, helispots)
- Are scouted for size and hazards
- Consider the topographic location (larger if upslope)
- Should be larger if downwind
- Should not include heavy fuels
- May need to be adjusted based on site specific fire behavior

The definition for a safety zone includes provisions for separation distance between the properly equipped and trained firefighter and the flames of at least four times the maximum continuous flame height. Distance separation is the radius from the center of the safety zone to the nearest fuels. For example, considering worst case 42 foot tall flame lengths that may be possible adjacent this site, then a 168 foot separation would be required, and more if there were any site-specific features that would result in more aggressive fire behavior. This is not to be confused with the required 100 feet FMZs. The firefighter safety zones are meant to keep firefighters in protective gear exposed to the air adequately set back from the nearest fuels.

If one considers the ignition resistant and maintained landscaping within the Paraiso Springs Resort, along with the adjacent fuel modification zones that will at a minimum, meet the applicable 100 foot wide standard, and Chapter 7A of California Building Code compliant structures, the Resort’s interior roads would provide Safety Zones available to responding firefighters. Additionally, an area such as the Paraiso Vineyards would provide an opportunity for a safety zone. These areas and the Paraiso Springs Resort on-site structures as Safety Zones can be part of MSRFPD’s and County’s pre-planning efforts and should be further studied by them to act as such.

**1.6.2.2 Temporary Firefighter Refuge Areas**

Firescope California defines a contingency plan when it is not possible to retreat to a safety zone. This contingency includes establishment of firefighter TRA(s), which are defined as:
A preplanned area where firefighters can immediately take refuge for temporary shelter and short-term relief without using a fire shelter in the event that emergency egress to an established Safety Zone is compromised.

Examples of a TRA may include the lee side of a structure, inside of a structure, large lawn or parking areas, or cab of apparatus, amongst others. Differences between a TRA and a Safety Zone is that TRA’s are closer to the immediate firefighting area, are considered a contingency to being able to get to a Safety Zone, do not include a requirement for a large area set back four times the flame lengths of adjacent fuels, and cannot be feasibly pre-planned until firefighters arrive on-scene and size up the situation.

Firescope appropriately notes that although Safety Zones and viable Escape Routes shall always be identified in the WUI environment, they may not be immediately available should the fire behavior increase unexpectedly. Often a TRA is more accessible in the WUI environment. A TRA will provide temporary shelter and short-term relief from an approaching fire without the use of a fire shelter and allow the responders to develop an alternate plan to safely survive the increase in fire behavior.

TRAs are pre-planned areas (planned shortly after firefighters arrive on scene) where firefighters may take refuge and temporary shelter for short-term thermal relief, without using a fire shelter in the event that escape routes to an established safety zone are compromised. The major difference between a TRA and a safety zone is that a TRA requires another planned tactical action, i.e., TRAs cannot be considered the final action, but must include self-defense and a move out of the area when the fire threat subsides. A TRA should be available and identified on site at a defended structure. TRAs are NOT a substitute for a Safety Zone. TRA pre-planning is difficult, at best because they are very site and fire behavior specific. For the Paraíso Springs Resort, TRAs would likely include areas throughout the resort where the minimum 100 feet wide fuel modification zones provide defensible space and maintained landscapes are provided, along with ignition resistant structures and wide roads that offer numerous opportunities for TRA.

The entire developed portions of the Paraíso Springs Resort, but especially the interior areas of resort, are considered TRAs. This is an important concept because it offers last-resort, temporary refuge of firefighters, and in a worst-case condition, resort guests and even local neighboring residents. This approach would be consistent with Firescope California (2013) which indicates that firefighters must determine if a safe evacuation is appropriate and if not, to identify safe refuge for those who cannot be evacuated, including civilians.

Each of the site’s interior structures that can be considered for TRA includes the following features:
• Ignition Resistant Construction
• A minimum 100 feet wide Fuel Modification Zones around perimeter of project
• Annual inspections by 3rd party fuel modification zone inspectors
• Wide roadways with fire hydrants
• Maintained landscapes and roadside fuel modification
• Ember resistant vents
• Interior fire sprinklers

Because there is the possibility that evacuation of the project may be less safe than temporarily refuging on-site, such as during a fast-moving, wind driven fire that ignites nearby, including temporary refuge within resort structures or elsewhere on site is considered a contingency plan for the Paraiso Springs Resort. This concept is considered a component of the “Ready, Set, Go!” model as it provides a broader level of “readiness” should the ability to execute an early evacuation be negated by fire, road congestion, or other unforeseen issues. Note: this approach would be considered a last-resort contingency during wildfire with the primary focus being on early evacuation.

1.7 Evacuation Plan Limitations

This Wildland Fire Evacuation Plan has been developed based on wildfire and evacuation standards and the Monterey County Transportation/Evacuation Annex (Monterey County 2010) and is specifically intended as a guide for evacuations for the Paraiso Springs Resort. This plan provides basic evacuation information that will familiarize residents with standard evacuation preparedness protocols as well as travel route options that may be available to them during an emergency. However, because emergencies requiring evacuation have many variables and must be evaluated on a case by case basis, this plan shall be subservient to real-time law enforcement and fire personnel/ agencies’ decision making and direction during an emergency requiring evacuation.

This Evacuation Plan promotes the “Ready, Set, Go!” model, adopted by the State of California and many fire agencies statewide, including MSRFPD. The goal is to raise agency and citizen awareness of potential evacuation issues and get a majority of the public “Ready” by taking a proactive stance on preparedness, training drills, and visitor education, and evacuation planning efforts. The Paraiso Springs Resort populace will be “Set” by closely monitoring the situation whenever fire weather occurs and/or when wildland fire occurs, and elevating pre-planned protocol activities and situation awareness. Lastly, officials will implement the plan and mandate that populations “Go” by executing pre-planned evacuation procedures in a conservative
manner, i.e., evacuation will occur based on conservative decision points, as proposed in this evacuation plan or when directed by fire and law enforcement personnel, whichever is more conservative. The preferred alternative will always be early evacuation. However, there may be instances when evacuation is not possible, is not considered safe, or is not an option based on changing conditions. For example, should a fire occur and make evacuation from the project ill advised, a contingency plan for guests and staff members will be available. This contingency would include moving people to pre-designated temporary refuge areas until it is safe to evacuate or the threat has been mitigated.

Ultimately, it is the intent of this Evacuation Plan to guide the implementation of evacuation procedure recommendations such that the process of evacuating people from the Paraiso Springs Resort project is facilitated in an efficient manner and according to a pre-defined evacuation protocol as well as providing a contingency option of temporarily refuging, if evacuation is considered less safe.

It is recommended that the evacuation process is carried out with a conservative approach to fire safety. This approach must include maintaining the Paraiso Springs Resort fuel modification landscape, infrastructural, and ignition resistant construction components according to the appropriate standards and embracing a “Ready, Set, Go!” stance on evacuation. Accordingly, evacuation of the wildfire areas should occur according to pre-established evacuation decision points, or as soon as they receive notice to evacuate, which may vary depending on many environmental and other factors. Fire is a dynamic and somewhat unpredictable occurrence and it is important for anyone living at the wildland-urban interface to educate themselves on practices that will improve safety.
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Attachment 2

Ready, Set, Go! Action Plan
READY, SET, GO!

YOUR PERSONAL WILDFIRE ACTION PLAN
Wildfire is a serious threat to lives, property and natural resources in California. The men and women of CAL FIRE make countless preparations and train frequently in order to be ready for all types of emergencies, including wildfires. Residents need to do the same.

You can dramatically increase your safety and the survivability of your property by preparing well in advance of a wildfire. This brochure provides comprehensive information on how to improve your home’s resistance to wildfires and prepare your family to be ready to leave early in a safe manner. We call this process, “Ready, Set, Go!”

The guide illustrates the importance of having defensible space around your home and it will help educate you about the preparations you need to make so you can leave early and evacuate well ahead of a wildfire. This brochure also provides information on how to retrofit your home with ignition resistant materials to address the threat of flying embers that can travel as far as a mile ahead of a flame front.

Fire is, and always has been, a natural part of the beautiful state we’ve chosen to live in. Wildfires, fueled by a build-up of dry vegetation and driven by hot, dry winds, are extremely dangerous and are challenging for firefighters to control. This publication will help you prepare your home so you can leave early; confident in the fact that you’ve done everything you reasonably can to protect your home from devastating wildfire.

I hope you’ll find the information on the next pages helpful. As always, if you need more information about preparing for wildfire or any other disaster, contact your nearest fire station or visit us on the web at www.fire.ca.gov.

Chief Del Walters
Director, CAL FIRE

All suggestions and requirements are based on State Codes and Regulations, specifically the California Building Code Chapter 7A, California Fire Code, and Title 14 Fire Safe Regulations. Contact your local fire and building department for specific requirements or recommendations for your community.
Living in the Wildland Urban Interface

Ready, Set, Go! begins with a house that firefighters can defend.

Defensible space works!

If you live next to a natural area, the Wildland Urban Interface, you must provide firefighters with the defensible space they need to protect your home. The buffer you create by removing weeds, brush and other vegetation helps to keep the fire away from your home and reduces the risks from flying embers.

A home within one mile of a natural area is at risk of flying embers. Wind-driven embers can attack your home. You and your home must be prepared well before a fire occurs. Ember fires can destroy homes or neighborhoods far from the actual flame front of the wildfire.
Defensible space is the required space between a structure and the wildland area that, under normal conditions, creates a sufficient buffer to slow or halt the spread of wildfire to a structure. It protects the home from igniting due to direct flame or radiant heat. Defensible space is essential for structure survivability during wildfire conditions and for the protection to firefighters defending your home.

**ZONE ONE**

Zone One extends 30 feet out from buildings, structures, decks, etc.

- Remove all dead or dying vegetation.
- Trim tree canopies regularly to keep their branches a minimum of 10 feet from structures and other trees.
- Remove leaf litter (dry leaves/pine needles) from yard, roof and rain gutters.
- Relocate woodpiles or other combustible materials into Zone Two.
- Remove combustible material and vegetation from around and under decks.
- Remove or prune vegetation near windows.
- Remove “ladder fuels” (low-level vegetation that allows the fire to spread from the ground to the tree canopy). Create a separation between low-level vegetation and non-vegetative materials such as patio furniture, wood piles, swing set, etc., from tree branches. This can be done by reducing the height of low-level vegetation and/or trimming low tree branches.

**ZONE TWO**

Zone Two extends 30 to 100 feet out from buildings, structures and decks. You can minimize the chance of fire jumping from plant to plant or other non-vegetative combustible, by removing dead material and removing, separating, and/or thinning vegetation. The minimum spacing between vegetation is three times the dimension of the plant or other non-vegetative combustible.

- Remove “ladder fuels.”
- Cut or mow annual grass down to a maximum height of 4 inches.
- Trim tree canopies regularly to keep their branches a minimum of 10 feet from other trees.
- Loose surface litter, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches, shall be permitted to a depth of 3 inches if erosion control is an issue.
What is a Hardened Home?

Construction materials and the quality of the defensible space surrounding it are what gives a home the best chance to survive a wildfire. Embers from a wildfire will find the weak link in your home’s fire protection scheme and gain the upper hand because of a small, overlooked or seemingly inconsequential factor. However, there are measures you can take to safeguard your home from wildfire. While you may not be able to accomplish all the measures listed below, each will increase your home’s, and possibly your family’s, safety and survival during a wildfire.

**ROOFS**

Roofs are the most vulnerable surface where embers land because they can lodge and start a fire. Roof valleys, open ends of barrel tiles and rain gutters are all points of entry.

**EAVES**

Embers can gather under open eaves and ignite exposed wood or other combustible material.

**VENTS**

Embers can enter the attic or other concealed spaces and ignite combustible materials. Vents in eaves and cornices are particularly vulnerable, as are any unscreened vents. New vents have been developed that prevent flame and embers from getting through to the attic.

**WALLS**

Combustible siding or other combustible or overlapping materials provide surfaces or crevices for embers to nestle and ignite.

**WINDOWS and DOORS**

Embers can enter gaps in doors, including garage doors. Plants or combustible storage near windows can be ignited from embers and generate heat that can break windows and/or melt combustible frames.

**BALCONIES and DECKS**

Embers can collect in or on combustible surfaces or the undersides of decks and balconies, ignite the material and enter the home through walls or windows.

To harden your home even further, consider protecting your homes with a residential fire sprinkler system. In addition to extinguishing a fire started by an ember that enters your home, it also protects you and your family year-round from any fire that may start in your home.

All suggestions and requirements are based on State Codes and Regulations, specifically the California Building Code Chapter 7A, California Fire Code, and Title 14 Fire Safe Regulations. Contact your local fire and building department for specific requirements or recommendations for your community.
**Home Site and Yard:** Ensure you have at least a 100-foot radius of defensible space (cleared vegetation) around your home. Note that even more clearance may be needed for homes in severe hazard areas. This means looking past what you own to determine the impact a common slope or neighbors’ yard will have on your property during a wildfire.

Cut dry weeds and grass before 10 a.m. when temperatures are cooler to reduce the chance of sparking a fire.

Landscape with fire-resistant plants that have a high moisture content and are low-growing.

Keep woodpiles, propane tanks and other non-vegetative combustible materials away from your home and other structures such as garages, barns and sheds.

Ensure that trees are far away from power lines.

**Roof:** Your roof is the most vulnerable part of your home because it can easily catch fire from wind-blown embers. Homes with wood-shake or shingle roofs are at high risk of being destroyed during a wildfire.

Build your roof or re-roof with ignition resistant materials such as composition, metal or tile. Block any spaces between roof decking and covering to prevent ember intrusion.

Clear pine needles, leaves and other debris from your roof and gutters.

Cut any tree branches within ten feet of your roof.

**Vents:** Vents on homes are particularly vulnerable to flying embers.

All vent openings should be covered with 1/8-inch to 1/4 inch metal mesh. Do not use fiberglass or plastic mesh because they can melt and burn.

Attic vents in eaves or cornices should be baffled or otherwise protected to prevent ember intrusion (mesh is not enough).

**Windows:** Heat from a wildfire can cause windows to break even before the home ignites. This allows burning embers to enter and start internal fires. Single-paned and large windows are particularly vulnerable.

Install dual-paned windows with one pane of tempered glass to reduce the chance of breakage in a fire.

Consider limiting the size and number of windows in your home that face large areas of vegetation.

**Inside:** Keep working fire extinguishers on hand. Install smoke alarms on each level of your home and in bedrooms. Test them monthly and change the batteries twice a year.

**Address:** Make sure your address is clearly visible from the road.

**Decks:** Surfaces within 10 feet of the building should be built with ignition resistant, non-combustible, or other approved materials.

Ensure that all combustible items are removed from underneath your deck.
Garage: Have a fire extinguisher and tools such as a shovel, rake, bucket and hoe available for fire emergencies. Consider installing weather stripping around and under door to prevent ember intrusion. Store all combustibles and flammable liquids away from ignition sources.

Driveways and Access Roads: Driveways should be built and maintained in accordance to the state and local codes to allow fire and emergency vehicles to reach your house. Consider maintaining access roads with a minimum 10-foot clearance on either side of the traveled section of the roadway and allowing for two-way traffic. Ensure that all gates open inward and are wide enough to accommodate emergency equipment. Trim trees and shrubs overhanging the road to allow emergency vehicles to pass.

Fencing: Consider using ignition resistant or non-combustible fencing to protect your home during a wildfire.

Eaves and Soffits Protection: Eaves and soffits should be protected with ignition resistant or non-combustible materials.

Rain Gutters: Screen or enclose rain gutters to prevent accumulation of plant debris.

Water Supply: Consider having multiple garden hoses that are long enough to reach any area of your home and other structures on your property. If you have a pool or well, consider a pump.

Patio Cover: Use the same ignition resistant materials for patio covering as a roof.

Walls: Wood products, such as boards, panels or shingles, are common siding materials. However, they are combustible and not good choices for fire-prone areas. Build or remodel with ignition resistant building materials, such as stucco, fiber cement, wall siding, fire retardant, treated wood, or other approved materials. Be sure to extend materials from foundation to roof.

Chimney: Cover your chimney and stovepipe outlets with an approved spark arrestor non-combustible screen with openings no smaller than 36 inch and no larger than 1/2 inch to prevent embers from escaping and igniting a fire. Make sure that your chimney is at least 10 feet away from any tree branches.
Now that you’ve done everything you can to protect your house, it’s time to prepare your family. Your Wildfire Action Plan must be prepared with all members of your household well in advance of a fire.

Use these checklists to help you prepare your Wildfire Action Plan. Each family’s plan will be different, depending on their situation.

Once you finish your plan, practice it regularly with your family and keep it in a safe and accessible place for quick implementation.

READY, SET, GO!
Create Your Own Wildfire Action Plan

GET READY

Prepare Your Family

☐ Create a Family Disaster Plan that includes meeting locations and communication plans and practice it regularly. Include in your plan the evacuation of large animals such as horses.

☐ Have fire extinguishers on hand and train your family how to use them.

☐ Ensure that your family knows where your gas, electric and water main shut-off controls are and how to use them.

☐ Plan several different evacuation routes.

☐ Designate an emergency meeting location outside the fire hazard area.

☐ Assemble an emergency supply kit as recommended by the American Red Cross.

☐ Appoint an out-of-area friend or relative as a point of contact so you can communicate with family members who have relocated.

☐ Maintain a list of emergency contact numbers posted near your phone and in your emergency supply kit.

☐ Keep an extra emergency supply kit in your car in case you can’t get to your home because of fire.

☐ Have a portable radio or scanner so you can stay updated on the fire.
OUTSIDE CHECKLIST

☐ Gather up flammable items from the exterior of the house and bring them inside (e.g., patio furniture, children’s toys, door mats, etc.) or place them in your pool.

☐ Turn off propane tanks.

☐ Don’t leave sprinklers on or water running - they can waste critical water pressure.

☐ Leave exterior lights on.

☐ Back your car into the driveway. Shut doors and roll up windows.

☐ Have a ladder available.

☐ Patrol your property and extinguish all small fires until you leave.

☐ Seal attic and ground vents with pre-cut plywood or commercial seals if time permits.

IF YOU ARE TRAPPED: SURVIVAL TIPS

☐ Shelter away from outside walls.

☐ Bring garden hoses inside house so embers don’t destroy them.

☐ Patrol inside your home for spot fires and extinguish them.

☐ Wear long sleeves and long pants made of natural fibers such as cotton.

☐ Stay hydrated.

☐ Ensure you can exit the home if it catches fire (remember if it’s hot inside the house, it is four to five times hotter outside).

☐ Fill sinks and tubs for an emergency water supply.

☐ Place wet towels under doors to keep smoke and embers out.

☐ After the fire has passed, check your roof and extinguish any fires, sparks or embers.

☐ Check inside the attic for hidden embers.

☐ Patrol your property and extinguish small fires.

☐ If there are fires that you can not extinguish with a small amount of water or in a short period of time, call 9-1-1.
By leaving early, you give your family the best chance of surviving a wildfire. You also help firefighters by keeping roads clear of congestion, enabling them to move more freely and do their job.

WHEN TO LEAVE

Leave early enough to avoid being caught in fire, smoke or road congestion. Don’t wait to be told by authorities to leave. In an intense wildfire, they may not have time to knock on every door. If you are advised to leave, don’t hesitate!

WHERE TO GO

Leave to a predetermined location (it should be a low-risk area, such as a well-prepared neighbor or relative’s house, a Red Cross shelter or evacuation center, motel, etc.)

HOW TO GET THERE

Have several travel routes in case one route is blocked by the fire or by emergency vehicles and equipment. Choose an escape route away from the fire.

WHAT TO TAKE

Take your emergency supply kit containing your family and pet’s necessary items.

EMERGENCY SUPPLIES

The American Red Cross recommends every family have an emergency supply kit assembled long before a wildfire or other emergency occurs. Use the checklist below to help assemble yours. For more information on emergency supplies, visit the American Red Cross Web site at www.redcross.org.

- Three-day supply of water (one gallon per person per day).
- Non-perishable food for all family members and pets (three-day supply).
- First aid kit.
- Flashlight, battery-powered radio, and extra batteries.
- An extra set of car keys, credit cards, cash or traveler’s checks.
- Sanitation supplies.
- Extra eyeglasses or contact lenses.
- Important family documents and contact numbers.
- Map marked with evacuation routes.
- Prescriptions or special medications.
- Family photos and other irreplaceable items.
- Easily carried valuables.
- Personal computers (information on hard drives and disks).
- Chargers for cell phones, laptops, etc.

Note: Keep a pair of old shoes and a flashlight handy in case of a sudden evacuation at night.
Write up your Wildfire Action Plan and post it in a location where every member of your family can see it. Rehearse it with your family.

**My Personal Wildfire Action Plan**

During High Fire Danger days in your area, monitor your local media for information on brush fires and be ready to implement your plan. Hot, dry and windy conditions create the perfect environment for a wildfire.

**Important Phone Numbers:**

<table>
<thead>
<tr>
<th>Out-of-State Contact:</th>
<th>Phone:</th>
</tr>
</thead>
</table>

| Work: | | |
|-------| | |

| School: | | |
|---------| | |

| Other: | | |
|--------| | |

**Evacuation Routes:**


**Where to go:**


**Location of Emergency Supply Kit:**


**Notes:**


California Department of Forestry and Fire Protection

*If you have an emergency, call 911*

CAL FIRE: 916-653-5123
Web site: http://www.fire.ca.gov

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READY, SET, GO!

This booklet has been adapted from the original, created by the Ventura County Fire Department.
Appendix 3
Memo to Monterey County, Lighting Impacts

Michael Baker International, 2019
MEMO

To: Monterey County Planning Department
From: Neil Hinckley, Michael Baker International
Date: February 13, 2019
Re: Paraiso Springs Resort Light Impact Review

Monterey County contracted Michael Baker International (Michael Baker) to review a prepared Monterey County response to the comments prepared by James Benya under contract with LandWatch, a land use advocacy group. Michael Baker was contracted to review the completed response and determine if the response adequately addresses the concerns raised by Mr. Benya and Landwatch. This review was performed by Neil Hinckley with expert advice and additional review provided by Lance Mackie, P.E., LC, RCCD, LEED AP; Peter Boucher; and Owen Milligan, California P.E.. Neil Hinckley has recently completed a lighting environmental impact study for Santa Clara County and assisted with an environmental impact lighting study for Almaden Golf and Country Club for the city of San Jose. Lance Mackie has specialized in lighting for the last 27 years, has earned his Lighting Certification from the National Council on Qualifications for the Lighting Professions (NCQLP), and has recently participated in a lighting environmental impact study for the city of San Pablo. Peter Boucher has more than 30 years of experience conducting environmental impact evaluations under the California Environmental Quality Act and National Environmental Policy Act. Owen Milligan, P.E., is a professional engineer with over 30 years of engineering experience. He has designed/been in responsible charge of many outdoor lighting projects, including highway lighting, parking lot lighting design, apron lighting and several sports venue lighting designs. Most of these designs required adherence to IESNA lighting requirements, ASHRAE 90.1 requirements, Dark Sky requirements or meeting LEED® exterior lighting requirements to achieve LEED® Silver or Gold.

After careful review of the response provided by Monterey County we have determined that the response adequately addresses all concerns raised by Mr. Benya with regard to the lighting impact of the proposed resort. While the concerns Mr. Benya raises are real and important, the RDEIR and the clarifications and context provided by the response demonstrate compliance with both the letter and intent of all relevant law, and consideration for the preservation of the area.

The primary concerns raised by Mr. Benya are:
1. That a variety of environmental impacts, including anthropogenic sky glow, trespass lighting, and glare are not adequately resolved by the RDEIR.
2. That LZ2 is not an appropriate classification of the project site.
3. That various cumulative effects from already approved or in progress developments could negatively impact the currently low levels of light pollution.
4. That the county and state requirements are not sufficient to prevent environmental impacts under CEQA.

After careful review of the RDEIR and the county's response to Mr. Benya we have found that the environmental impacts of sky glow, light trespass, and glare are sufficiently addressed, and appropriate mitigation measures are outlined in the RDEIR.

We also confirmed Mr. Benya's finding of a Bortle value of approximately 3.5 for the site using the newer ATLAS 2015 data set (as presented on www.lightpollutionmap.info) and are in agreement with the county response that a Bortle value of 3.5 is consistent with the site's classification by the state of California as LZ2, or a rural location, and that reclassification of the site as LZ0 or LZ1 is not warranted.

The county response also demonstrates that there are no other developments in planning or construction stages near the proposed resort, and so there are no cumulative effects that need to be presented or mitigated by the RDEIR.

We also reviewed the California state and Monterey County laws that will apply to this development, including Title 24 Part 6 and Part 11, the Monterey County General Plan, Monterey County Design Guidelines for Exterior Lighting, and Monterey County Code 21.22.070 E, and have found that the requirements contained in these laws and codes are sufficient to maintain the site at or below LZ2 levels of light pollution in all its forms. We also find no need to apply the Model Lighting Ordinance (MLO) or LEED 4. The lighting requirements of Title 24 are heavily based upon the MLO, and are in some ways even more restrictive. LEED 4 also allows more uplight than allowed by Title 24 and Monterey County codes, guidelines, and standard conditions, which is a major contributor of anthropogenic sky glow.

In addition to the information provided in this memo, we are providing additional technical information on the topics discussed in this memo and in Mr. Benya's comments, to support the RDEIR response to comments on this topic. See Attachment 1.

Sincerely,

Neil Hinckley

Electrical Associate II, Michael Baker International
Lance Mackie, P.E., LC, RCDD, LEED AP
Technical Manager – Electrical Engineering, Michael Baker International

Owen Milligan, California P.E.
Senior Electrical Engineer, Michael Baker International

Peter Boucher
Technical Manager, Michael Baker International
Attachment 1 to Memo dated February 13, 2019
Lighting Response Letter 10, Number 5

The following discussion provides technical information in support of the County’s discussion found in the Paraiso Hot Springs Recirculated Draft Environmental Impact Report (RDEIR) in section 3.1.2, Environmental Setting, Aesthetics and Visual Resources, section 3.1.4, Impact Analysis, Aesthetics and Visual Resources, and in section 4.5.2, Cumulative Impacts Assumptions and Analysis (RDEIR page 4-6).

**Terminology**

**a. Light**
For purposes of this response, "light" refers to light emissions, or the degree of brightness, generated by a given source. Artificial lighting may be generated by point sources - focused points of origin representing unshielded light sources - or by indirectly illuminated sources of reflected light. Light may be directed downward to illuminate an area or surface; cast upward into the sky by an unshielded fixture and refracted (dispersed) by atmospheric conditions (sky glow); or cast sideways and outwards onto off-site properties (light trespass or overspill).

Sky glow and light trespass are considered forms of light pollution, which encompasses any adverse impacts of artificial lighting.

**b. Light Pollution**
The International Dark Sky Association defines light pollution as, "Any adverse effect of artificial light". They explain that light pollution includes light trespass, sky glow, and glare, with secondary effects including decreased nighttime visibility and energy waste.

**c. Glare**
The International Dark Sky Association defines glare as “Intense and blinding light that reduces visibility. A light within the field of vision that is brighter than the brightness to which the eyes are adapted” (http://darksky.org/our-work/resources/glossary/). Glare is focused, intense light directly emanated by a source or indirectly reflected by a surface from a source. The absolute measurement of light intensity on a given surface is objective, but human perception of that light intensity as a source of actual glare is dependent on the size, position, distance, and degree of visibility of a source from a given vantage point; the number of sources in a given area; and the luminance, or light levels, to which the eye of the beholder is adapted.

Glare is generally experienced as visual discomfort caused by high contrast in brightness levels in a given environment, or it may cause actual disability, such as a reduction in motorists' ability to see or identify objects. Daytime glare is typically caused by the reflection of sunlight from highly reflective surfaces at or above eye level. Reflective surfaces are generally associated with buildings clad with broad expanses of highly polished surfaces or with broad, light-colored areas of paving. Daytime glare is generally most pronounced during early morning and late afternoon hours when the sun is at

1 [http://darksky.org/our-work/resources/glossary/]
a low angle and the potential exists for intense reflected light to interfere with vision and driving conditions. Daytime glare may also hinder outdoor activities conducted in surrounding land uses, such as sports.

Nighttime glare refers to direct, intense, focused light, as well as reflected light, and hampers visibility. Glare caused by direct sources of light generally originates from mobile and therefore transitory sources, such as automobiles. Nighttime glare may also originate from particularly intense stationary sources, such as floodlights. As with daytime sun glare, such intense light may cause undesirable interference with driving or other activities.

**Light-Sensitive Uses in the Project Vicinity**

Some land uses are considered "light-sensitive receptors," including residences, natural areas, hotels, or hospitals, since minimal nighttime illumination levels may be essential to the proper function, use, or enjoyment of these uses\(^2\). Sensitive receptors in the Project vicinity include single family residences on Paraiso Springs Road to the east of the Project site and natural areas.

**Classification of Ambient Light Levels**

Beginning with the 2005 Building Energy Efficiency Standards, the California Energy Commission adopted Outdoor Lighting Zone requirements that specified lighting power allowances based on project locations in the state and whether the surrounding environment is wild (dark), rural (characterized by low to moderate ambient light levels) or urban (characterized by higher ambient light levels). The most recent requirements for lighting in California, Title 24, which is a very restrictive state code, took effect January 1, 2017. Lighting zones reflect the base (or ambient) light levels desired by a community. State designated lighting zones have been established for each area of the state. Table 10-114A of the California Code of Regulations, Title 24 Article 1, Section 10-114 specifies the relative ambient illumination level and the statewide default location for each lighting zone.

Exterior lighting allowances in California vary by the established Lighting Zones (LZ). The regulations contain lighting power allowances for newly installed equipment and specific alterations that are dependent on the project site’s assigned Lighting Zone. Lighting Zone designations are public information, serve to quantify the existing project site ambient light conditions and are based on the latest (2010) U.S. Census Bureau data. They are designed to establish standards that limit light pollution and ensure light levels are appropriate for the purpose and the area.

In his comments, Mr. Benya, a lighting expert who provided a memorandum to LandWatch Monterey County related to this comment, has suggested that a permanent declaration of Lighting Zone 0 (LZ0) and Lighting Zone 1 (LZ1) be applied to the project as opposed to the designation applied by Title 24 for rural areas, which is Lighting Zone 2 (LZ2), based on the location of the project site as explained below.

Zone LZ0 has an ambient illumination designation of “very low” with a Statewide Default Location for this zone as “Undeveloped area of government designated parks, recreation areas, and wildlife preserve”. This designation would not apply to the project site as the project site has been a commercial visitor serving property since the late 1800s and is located in an area surrounded by agricultural and residential land uses. The site and adjacent lands are not a government designated park, recreation area or wildlife preserve (Table 10-114A, California Code of Regulations, Title 24 Article 1, Section 10-114; County staff site visit on October 18, 2017).

Zone LZ1 has an ambient illumination designation of “low” with a Statewide Default Location for this zone as “Developed portion of government designated parks, recreation areas and wildlife preserves. Those that are wholly contained within a higher lighting zone may be considered by the local government as part of that lighting zone”. The LZ1 lighting zone designation does not apply to this project site as it is not a developed portion of a government designated park, recreation area, or wildlife preserve.

Zone LZ2, which is the state designated zone for this site, has an ambient illumination designation of “moderate” with a Statewide Default Location for this zone as “Rural areas, as defined by the 2010 U.S. Census.” The LZ2 designation is the proper designation as it relates to this project site, which is located in Census Tract 111.01. The project would need to comply with the lighting standards in Title 24 for this Lighting Zone designation.

In his memo, Mr. Benya states that the “The current portion of light pollution in a particular region can be measured from satellite data and classified according to the Bortle Scale. The proposed Resort would be in an unusually dark sky region of coastal California. With a Bortle value of about 3.5, the area can be described as possessing a dark sky offering views of the zodiacal light, thousands of stars, and the Milky Way. But the Milky Way lacks detail, clouds are illuminated from below and the light domes of San Jose and small cities are visible on the horizon caused by regional light pollution.”

Bortle Scale
The definition for the Bortle scale states:
“The Bortle scale is a nine-level numeric scale that measures the night sky’s brightness of a particular location. It quantifies the astronomical observability of celestial objects and the interference caused by light pollution. John E. Bortle created the scale and published it in the February 2001 edition of Sky & Telescope magazine to help amateur astronomers evaluate the darkness of an observing site, and secondarily, to compare the darkness of observing sites. The scale ranges from Class 1, the darkest skies available on Earth, through Class 9, inner-city skies. It gives

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several criteria for each level beyond naked-eye limiting magnitude (NELM). The accuracy and utility of the scale have been questioned in recent research.\(^4\,5\,6\).

Mr. Benya assigns a 3.5 Bortle scale class to the site, which is between Bortle Class 3 and Bortle Class 4. While a Bortle scale Class of 3.5 is not defined, we can provide the following information related to Classes 3 and 4. The Bortle Scale Class 4 Description is “Rural/suburban transition” with the following description points\(^7\,8\):

- the zodiacal light is still visible, but does not extend halfway to the zenith at dusk or dawn
- light pollution domes visible in several directions
- clouds are illuminated in the directions of the light sources, dark overhead
- surroundings are clearly visible, even at a distance
- the Milky Way well above the horizon is still impressive, but lacks detail
- \textbf{M33} is a difficult averted vision object, only visible when high in the sky

The Bortle Scale Class 3 designation is described as “Rural sky” with the following description points\(^9\,10\):

- the zodiacal light is striking in spring and autumn, and color is still visible
- some light pollution evident at the horizon
- clouds are illuminated near the horizon, dark overhead
- Milky Way still appears complex
- M31 (Andromeda Galaxy) is obviously visible
- \textbf{M33} is only visible with averted vision

Looking at the Bortle Scale Class 4 or Class 3 description of “Rural/suburban transition” or “Rural sky” both appear to be consistent with the statewide “Rural” designation for the project site confirming that the California Energy Code Lighting Zone (LZ2) for the project site is the proper Lighting Zone. Development of the project must comply with the lighting standards in Title 24 for that zone. The Light Pollution Map website\(^12\) shows that the project site is influenced by light pollution from the cities, and appears to be on the margin between Bortle Scale Classes 3 and 4 (Exhibits 1 and 2). Even if the County agrees that the Bortle Class should be 3.5, for the reasons described in this response, the potential environmental impact from the proposed project’s light and

\(^4\) https://en.wikipedia.org/wiki/Bortle_scale
\(^5\) http://www.bigskyastroclub.org/lp_bortle.html
\(^6\) https://academo.org/demos/bortle-scale/
\(^7\) http://www.bigskyastroclub.org/lp_bortle.html
\(^9\) http://www.bigskyastroclub.org/lp_bortle.html
\(^11\) M33 is the Triangulum Galaxy, the third largest as viewed from Earth behind the Milky Way and Andromeda galaxies https://www.space.com/25585-triangulum-galaxy.html
\(^12\) www.lightpollutionmap.info
glare is a less than significant impact on the physical environment.

**Title 24 (California Code of Regulations)**

Title 24 provides regulations to efficiently use lighting and save energy, including directing lighting to intended area, using occupancy sensors, multi-level lighting to provide efficient lighting levels, and mandatory and optional requirements to meet strict limitations as outlined in the regulation. All regulated, nonresidential buildings must be designed and built to comply with the mandatory measures of Title 24, Parts 6 and 11 with certain sections of that code specifically addressing light pollution reduction measures based on the statewide established Lighting Zone. In addition to meeting the mandatory requirements, buildings must also comply with additional requirements specified within the Energy Standards. The Energy Standards requirements for outdoor lighting apply to hardscape areas and designated landscape areas. This typically consists of the paved portions of an outdoor building site but may also include planters or other small areas of landscaping within the application area.

It is important to note that the standards in Title 24 were developed to ensure that new lighting introduced into an existing area would maintain the existing ambient light levels of the designated area thus eliminating any significant impacts related to light pollution either individually or cumulatively to the area. The exterior lighting portions of Title 24 are also heavily based on the Model Lighting Ordinance (MLO) created by the International Dark-Sky Association (IDA) and the Illumination Engineering Society of North America (IESNA), groups which have a heavy interest in reducing light pollution and the technical expertise need to provide viable design guidelines.\(^{13}\)

**Illuminating Engineering Society of North America Standards**

The outdoor lighting requirements within California Building Code Title 24 conserve energy, reduce winter peak electric demand, and are both technically feasible and cost effective. They set minimum control requirements, maximum allowable power levels, minimum efficacy requirements, and mandate outdoor lighting design parameters that must follow the Illuminating Engineering Society backlight, uplight and glare ratings as defined in their technical memorandum TM-15-11 for controlling light pollution for all outdoor lighting systems based on the state assigned lighting zone. The lighting power allowances are based on current Illuminating Engineering Society of North America (IES) recommendations for the quantity and design parameters of illumination, current industry practices, and efficient sources and equipment that are readily available. Data indicates that the IES recommendations provide more than adequate illumination, based on a 2002 baseline survey of outdoor lighting practice in California that showed that the majority of outdoor lighting illuminates at substantially lower levels than IES recommendations.

**Title 24 Mandatory Interior Lighting Controls**

Title 24 non-residential lighting standards also have regulations for controlling indoor lighting. The Title 24 non-residential lighting standards are the result of the involvement of many representatives of the lighting design and manufacturing community, and of enforcement agencies across the state. A great deal of effort has been devoted to making the lighting requirements practical and realistic.

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Hotel/motel guest rooms are covered by portions of both the nonresidential indoor lighting requirements and the residential indoor lighting requirements. The residential indoor lighting requirements are covered in the Residential Compliance Manual.\(^\text{14}\)

The primary mechanism for regulating indoor lighting under the standards is to limit the allowed lighting power in watts installed in the building. Other mechanisms require basic equipment efficiency and require that the lighting be controlled to permit efficient operation.

All lighting systems are required to have switching or control capabilities that turn off lights when they are not needed. In addition, it is desirable to reduce light output and power consumption when full light output is not needed. These mandatory requirements apply to all nonresidential, high-rise residential and hotel/motel buildings for both conditioned and unconditioned interior spaces. A partial list of the Title 24 non-residential mandatory lighting control requirements can be summarized as follows:

- Light switches (or other control) in each room
- Separate controls for general, display, ornamental, and display case lighting
- Occupant sensors in offices 250 ft\(^2\) or smaller, multi-purpose rooms less than 1000 ft\(^2\), classrooms of any size, and conference rooms of any size
- Partial ON/OFF occupant sensors are required in aisle ways and open areas in warehouses, library book stack aisles, corridors, and stairwells
- Multi-level control (dimming capability) for lighting systems > 0.5 W/ft\(^2\) in rooms > than 100 ft\(^2\).
- Automatic daylighting controls in daylit areas >100 ft\(^2\) except when the total installed general lighting is less than 120 watts or the glazing area is less than 24 ft\(^2\).
- Demand responsive controls in buildings larger than 10,000 ft\(^2\) automatically reducing lighting power by a minimum of 15% in response to a demand response signal.

**Recirculated Draft EIR**

The RDEIR, on pages 3-263 through 3-265, addresses consistency of the project related to General Plan policies regarding aesthetics. This discussion addresses impacts of lighting related to policies 26.1.6, 26.1.20, 26.1.6.1 (CSV), and 40.1.2 (CSV). The discussion on RDEIR page 3-25 explains how the project planner reviews the lighting plan to achieve the purpose of the General Plan policy and protect biological and aesthetic resources, as well as to ensure that lighting does not cause a safety issue through glare or through directing bright lights at sensitive receptors, roadways or into the sky.

The effects of interior lighting were considered in the RDEIR analysis (see Impact 3.1-2 discussion). As explained on page 2-20 of the Recirculated Draft EIR, the design of the project is proposed to be Mission Revival style, with “limited fenestration” and “wide, projecting eaves.” These features function as ways to additionally limit light spill toward the sky and off site, due to the limited number of windows and eaves that cut off light toward the sky, as well as the goals of the project to generally keep lighting subdued (RDEIR Figures 2-9a through 2-9h). The nearest residences are from over 1000 feet to approximately a mile from the development site, but have limited visibility of

the proposed development area due to topography and existing vegetation that will be retained
(RDEIR Figure 2.4, Figure 2-5a, Figure 2-6, Figure 2-8, page 3-24).

**Project Impacts**

**Construction**

Construction of the proposed project would occur over an approximately 10-year period, with one or
more on-site parcels developed simultaneously. On-site construction lighting would represent a
marginal increase in existing ambient nighttime light levels on any sensitive receptors (three single
family residences on Paraiso Springs Road) close to the Project site because of the small size of the
construction sites(s) lighted at any given time and because of the distance and/or intervening
vegetation and topography between most on-site construction and off-site sensitive receptors and the
fact that the closest receptor is over 1000 feet away from the easternmost part of the project site.
Nighttime construction would not be typical, but could occur on occasion. Construction lighting
would be temporary and removed upon completion of construction. Therefore, construction lighting
would not substantially increase the ambient illumination levels in off-site areas surrounding the
Project site through light spillover or sky glow or interfere with off-site activities, and impacts would
be less than significant.

Construction activities are not anticipated to create sources of glare that could affect visibility in the
Project area, because of the depth of building setbacks from surrounding roadways, the use of
building materials that are low-reflectivity in nature, and construction is not expected to involve
bright light sources that would be visible from off-site locations. Therefore, impacts due to glare
generation and interference with the performance of an off-site activity or adverse effects on views
would be less than significant during construction.

**Operation**

The proposed Project would introduce a variety of permanent new sources of lighting to the Project
site including exterior and interior lighting. Generally, the topography and landscape of the Project
site, which will primarily occupy two valleys, surrounded on three sides by mountains, severely
constrains the influence that Project-related light sources would have on off-site uses or the night
sky.

The only sensitive receptors near the Project site are the single-family residences on Paraiso Springs
Road. The nearest proposed development on the Project site, at the eastern end of the property,
would be separated from the nearest off-site residence by a horizontal distance of at least 1050 feet
and an elevation differential, since the Project property sits higher in elevation than the residences.
Because of distance and topography, and the fact that the Monterey County standard condition calls
for fully controlling lighting impacts offsite, as well as Title 24 Standards, the project light sources
would not substantially increase ambient illumination levels. Potential impacts from light and glare
would be less than significant. Timeshare condominium lighting sources may be visible from off-site
residences and would incrementally increase ambient illumination levels in this area; however, the
increase is expected to be minor and would constitute a less than significant impact due to lighting
controls required by Monterey County and by Title 24 for the applicable Lighting Zone.

Only low-reflective building materials, such as darker shades of roofs and plaster walls using a
variety of earth tones are anticipated to be used. Therefore, project-related glare impacts and the
potential for interference with the performance of any off-site activity or adverse effects on views would be less than significant.

Interior Lighting Sources
Interior lighting sources from the hotel units and timeshare condominiums on the project site may be visible from offsite and may increase ambient illumination levels in this area, however the increase is expected to be minor and would constitute a less than significant impact.

Interior source lighting is contemplated under the LZ2 lighting zone designation of “rural” as all residences in the area operate interior lights at night. The hotel rooms and timeshares use of interior lights would be required to be consistent with the visually sensitive area and the LZ2 lighting designation. The design of the project is proposed to be Mission Revival style, with “limited fenestration” and “wide, projecting eaves.” These features function as ways to additionally limit light spill toward the sky and off site, due to design and a limited number of windows. Consistent with resort properties, it is expected that all rooms will have interior window coverings, curtains and or shades that will be drawn for privacy at night and act to shield and reduce any lighting effects from interior lights. Interior lighting effects would also be limited as visitors are not expected to be up all night and lights would be extinguished as visitors to the resort retire for the night.

In summary, because of distance and topography, Title 24 lighting control regulations, window design, window coverings and expected night time use, interior lighting would have no impacts on any offsite sensitive receptors which are the residences on Paraiso Springs Road and project indoor lighting would not substantially increase ambient illumination levels in off-site areas surrounding the Project site.
## Exhibit 1: Bortle Scale Map Legend

<table>
<thead>
<tr>
<th>Bortle Scale Number</th>
<th>Color on Map</th>
<th>Limiting Magnitude</th>
<th>Sky Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Excellent Dark Site</td>
<td>8</td>
<td>Dark Site</td>
<td>Airglow is very weak and near horizon</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Zodiacal Light is across the night sky</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Milky Way casts shadows</td>
</tr>
<tr>
<td>2</td>
<td>Dark Site</td>
<td>7.5</td>
<td>Dark Site</td>
<td>Airglow is weakly visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Zodiacal Light casts shadows</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Milky way is very detailed</td>
</tr>
<tr>
<td>3</td>
<td>Rural</td>
<td>7</td>
<td>Rural</td>
<td>Clouds are faintly lit at horizon</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Zodiacal light visible well above horizon</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Milky Way appears complex</td>
</tr>
<tr>
<td>4</td>
<td>Rural/Suburban</td>
<td>6.5</td>
<td>Rural/Suburban</td>
<td>Clouds are lit only at horizon</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Zodiacal Light is visible halfway above horizon</td>
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<td></td>
<td></td>
<td></td>
<td>Milky Way structure starts to show</td>
</tr>
<tr>
<td>5</td>
<td>Suburban</td>
<td>6</td>
<td>Suburban</td>
<td>Clouds and ground are faintly lit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Some Zodiacal Light</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Milky Way is slightly more visible overhead</td>
</tr>
<tr>
<td>6</td>
<td>Bright Suburban</td>
<td>5.5</td>
<td>Bright Suburban</td>
<td>The sky glows gray at horizon</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Constellations are visible</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Milky Way visible overhead</td>
</tr>
<tr>
<td>7</td>
<td>Suburban/Urban</td>
<td>5</td>
<td>Suburban/Urban</td>
<td>The sky has a gray/yellow glow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bright constellations are visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No Milky Way</td>
</tr>
<tr>
<td>8</td>
<td>City</td>
<td>4.5</td>
<td>City</td>
<td>The sky has an orangeish glow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Brightest constellations are visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No Milky Way</td>
</tr>
<tr>
<td>9</td>
<td>Inner-City</td>
<td>4 at best</td>
<td>Inner-City</td>
<td>The sky has a bright glow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Only bright stars are visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No Milky Way</td>
</tr>
</tbody>
</table>