

# Wildland Fire Risk Report NorthLake Project



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## Executive Summary

Firesafe Planning Inc. performed an assessment of risks related to wildfires (Wildland Fire Risk) in order to assess the intensity of a wildfire approaching the Project Site (See Figure 2 below). This report provides the results of that assessment and objective hazard and risk assessments which can be used to establish the community mitigations (hazard less mitigations = risk) that are equal to or greater than the hazards which would be encountered in a worst-case scenario.

The study takes into consideration existing/future vegetative interface fuels, topography, fire history and weather conditions during extreme fire conditions. The report provides results of computer calculations that measured the fire intensity, flame lengths, rate of spread, and fire travel distance (arrival times) from worst-case scenario wildfires in both the extreme (Diablo wind) and the predominant (Onshore wind) wind conditions.

The results of fire behavior calculations have been incorporated into the analysis of the interfaces of the project with adjacent wildlands and the potential ingress/egress routes used by the Project Site on a daily basis and under emergency conditions where evacuation might be possible.

The California Attorney General's "*Best Practices for Analyzing and Mitigating Wildfire Impacts of Development Projects Under the California Environmental Quality Act*" guidelines encompass the CEQA Appendix G, Section XX, subsection a, b, and c requirements and as this report addresses the guidelines, it addresses the Appendix G issues in the same effort.

The Project Site has three configurations (referred to as alternatives) under review for this analysis. The first is the project as previously approved (Previously Approved Project); the second, a configuration that avoids Grasshopper Creek entirely (Creek Avoidance Alternative); and the third configuration which partially avoids the Grasshopper Creek areas (Partial Creek Avoidance Alternative).

When viewed side-by-side, the differences in scope of the two alternatives are more readily visible, as shown (Figure 7, page 13). The Partial Creek Avoidance Alternative will not develop to the north as much as the other two alternatives.

This report has examined the topography (slope, aspect, elevation, location of development as it relates to the upslope and downslope areas), weather history, fire history, wildland fuels (type, configuration, continuity, and density), and current/anticipated infrastructure (roads, fuel modification, fire resources, and water distribution and storage system). The current and future (code and regulation requirements which will be in place by the time of development) regulations, codes, standards, guidelines, and recommended practices relating to wildland fire safety are also addressed. It has been assumed that this project will comply with all current and future regulations in the development of the site and the construction of the structures.

The analysis of Wildland Fire Risk starts with the review of the hazards, the likelihood of an event, and the intensity of that event which is then examined against the vulnerability (exposure and susceptibility) to provide a "level of risk". This has been accomplished using fire modeling (BehavePlus and FlamMap) software as provided by the U. S. Forest Service.

Static Modeling using BehavePlus (single site, set conditions) indicates that in a worst-case scenario (not currently present at or near the development area) a maximum flame length of 50' +/- may be possible when the fire is running upslope, in a continuous fuel bed (SCAL18 sage and buckwheat), in line with the wind, on a very dry hot day. If the fuels were to become six-foot chaparral fuel beds (not shown/achieved in historic fuel coverage data), the flame length could reach 63' (Sh5 fuel). This configuration is not present in the current (fuels prior to the Route Fire) interface and does not seem to have been present in the past in a review of aerial images over the past 30 years except on north facing slopes in small areas which are not below the development area(s) and not likely to produce a self-sustaining maximum fire output burning in equilibrium.

In a review of all flame lengths for all scenarios run in FlamMap, no cells within or adjacent to the Project Site had values greater than those for the worst-case scenario (63' flame length) in BehavePlus. Using the Minimum Travel Time feature of FlamMap, it is possible to project the time it might take for a given fire scenario to travel the distance from the origin to each of the evacuation points within the Project Site and when they might impact the Evacuation Points. These results are provided for each scenario in the appendix and summarized in the matrix (Matrix 1, page 64) in this report.

All scenarios have at least one Evac (evacuation) Point which is viable for 4 hours or more, with the exception of the Freeway Spots scenario where only 30 minutes are available before Ridge Route Road is impacted for a period of time. All of the fire scenarios are run under extreme conditions. When in alignment (wind, slope, aspect, and fuels), the rate of spread is extremely high and the fire travels large distance in a short period of time. In all scenarios, burn through of the community is not modeled or expected given the fuel modification zones, hardened structures and restrictions on vegetation which will be in place by the various codes, ordinances and standard required by the Los Angeles County Fire Department for new development within the Very High Fire Hazard Severity Zones.

The size, location and configuration of the Project Site makes it unlikely that a fire will impact the entire Project Site at a single time, but rather the fire will impact sections of the project interface over a period of time which will allow for resources to be redistributed and for evacuation opportunities after the fire front has passed a specific location. Travel within the Project Site should be viable at all times given the distance from the wildland fuels and the wildland fire protection features which will be provided (as required by the various code, ordinances and regulations).

The development will provide more water storage than is required by the fire code and will in fact, provide additional regional fire duration capacity which benefits many structures beyond the development area.

A site will be provided for a new fire station within the development. In addition, the project will pay its proportionate fees for the construction of that station which will enhance the regional fire protection already in place. With the new fire station, adequate fire resources are present to protect the development.

This report reaches the conclusion that the expected fire behavior in the interface of the NorthLake development indicates that the fire behavior could produce extreme fire behavior and as such, implementation of wildland fire protection measures will be necessary. Many of these measures are required by the State and Local fire/building regulations, fire department standards and guidelines, and by mitigations already considered and applied by the development review processes to the Previously Approved project. Fire behavior modeling suggests that there will be several hours in which to evacuate the Project Site under fire scenarios where the fire is burning into the community from an adjacent area under each of the development scenarios considered, except with the Freeway Spots scenario, where all configurations will have a period of time where Ridge Route Road is impacted for 90 minutes or more and would require sheltering in place within the development for this period. The north evacuation route would be open during that period. Where fires are initialized within the Project Site or near its boundary, the fire incident command and control will have to determine if the population will be moved or “sheltered in place”.

The proposed community with its increased built-in fire protection features (defensible space, fuel modification, hardening of the structures and required maintenance), placement of the structures on the topography, overall orientation to the fuels, wind, and slope and nested (safe center) configuration would be a candidate for a “shelter in place” decision. While “shelter in place” is never a first option, history shows us that moving populations once the fire has arrived has increased risk and should not be attempted when safe alternatives exist.

The configuration of the Project Site, the placement of the structures and features on the topography and the nature of the wildland fuels surrounding the Project Site create conditions where the fire will travel at great speeds when wind, slope and fuel align but the three access points that empty onto Ridge Route Road are not impacted by fire at the same time.

The fire behavior modeling in this report with flame lengths of up to 63' under the worst-case scenario would be protected by the LACFD standards. Fuel modification is designed to reduce and change the fuel types as the combustible vegetation gets closer to the structure. As “rule of thumb” two times the maximum flame length is adequate protection from radiant heat in a hardened structure. These distances also protect from direct flame contact and convected heat. The structure hardening (includes ember intrusion projection) protects from embers and brands which may travel long distances under worst-case conditions.

With respect to the defensible space distance for the perimeter structures, the LACFD requires distances up to 200 feet of fuel modification depending on the adjacent fire potential as measured by the slope, aspect, fuel characteristics, fire history and weather data (wind, temperature and relative humidity). While the distance required in the thinning zones may be allowed to be reduced based on the level of hazard present, the zones nearest the structures are rarely reduced. In any event, LACFD's 200' fuel modification requirement more than satisfies the needed distance based on 63' flame length (126').

Additionally, the implementation of the Zone 0 (first five feet from the structure) and LACFD's decision to make the fuel modification zone on all sides of the structure and not just the wildland interface will only enhance the already robust level of protection for the Project Site.

It has been determined that, with the mitigations in place, the development area will have a less than significant impact on the wildland fire related issues raised under the AG guidelines.

## Purpose and Scope of Report

Firesafe Planning Inc. performed an assessment of risks related to wildfires in order to assess the intensity of a wildfire approaching the Project Site. This report provides the results of that assessment and objective hazard and risk assessments which can be used to establish the community mitigations (hazard less mitigations = risk) that are equal to or greater than the hazards which would be encountered in a worst-case scenario.

The study takes into consideration existing/future vegetative interface fuels, topography, fire history and weather conditions during extreme fire conditions. The report provides results of computer calculations that measured the fire intensity, flame lengths, rate of spread, and fire travel distance (arrival times) from worst-case scenario wildfires in both the extreme (Diablo wind) and the predominant (Onshore wind) wind conditions.

The results of fire behavior calculations have been incorporated into the analysis of the interfaces of the project with adjacent wildlands and the potential ingress/egress routes used by the Project Site on a daily basis and under emergency conditions where evacuation might be possible.

The Fire Hazard Planning Technical Advisory General Plan Technical Advice Series, 2022 Update Finalized – August 2022, Figure 7, Page 31, from the Governor's Office of Planning and Research provided a visualization of risk vs hazard for wildfires as shown below (Figure 1). This report will use this guidance and terminology.

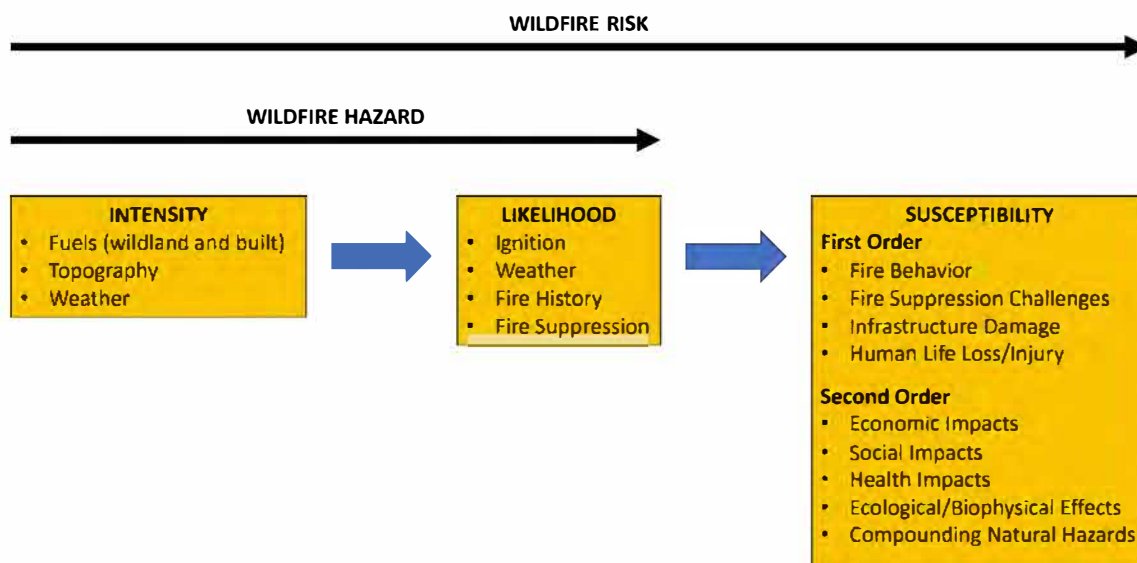


Figure 1 - Visualization of risk vs. hazard for wildfires-



### Scope

This document will address the following tasks as outlined in the California Attorney General's "*Best Practices for Analyzing and Mitigating Wildfire Impacts of Development Projects Under the California Environmental Quality Act*" (AG Guidelines):

1. Determination if project impact will substantially impair an adopted emergency response plan or emergency evacuation plan;
2. Determine the project-specific Wildland Fire Hazard and Wildland Fire Risk to quantify issues that may exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;
3. Determine if the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment;
4. Determine if people or structures will be exposed to significant risks due to the completion of the project; and
5. Consider whether a project will "expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires".

CEQA Appendix G,

Section XX. WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

- a. Substantially impair an adopted emergency response plan or emergency evacuation plan.
- b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?
- c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

The AG guidelines encompass the CEQA Appendix G, Section XX, subsection a, b, and c requirements and as this report addresses the guidelines, it addresses the Appendix G issues in the same effort.

## Project Description

The Project Site is located in an unincorporated area of Los Angeles County, California, near the community of Castaic, California. The Project Site is north of Interstate 5 and the community of Castaic, east of Ridge Route Road, west of Castaic Lake and south of the Templin Highway, as shown in Figure 2 (below) and Figure 3 (next page).

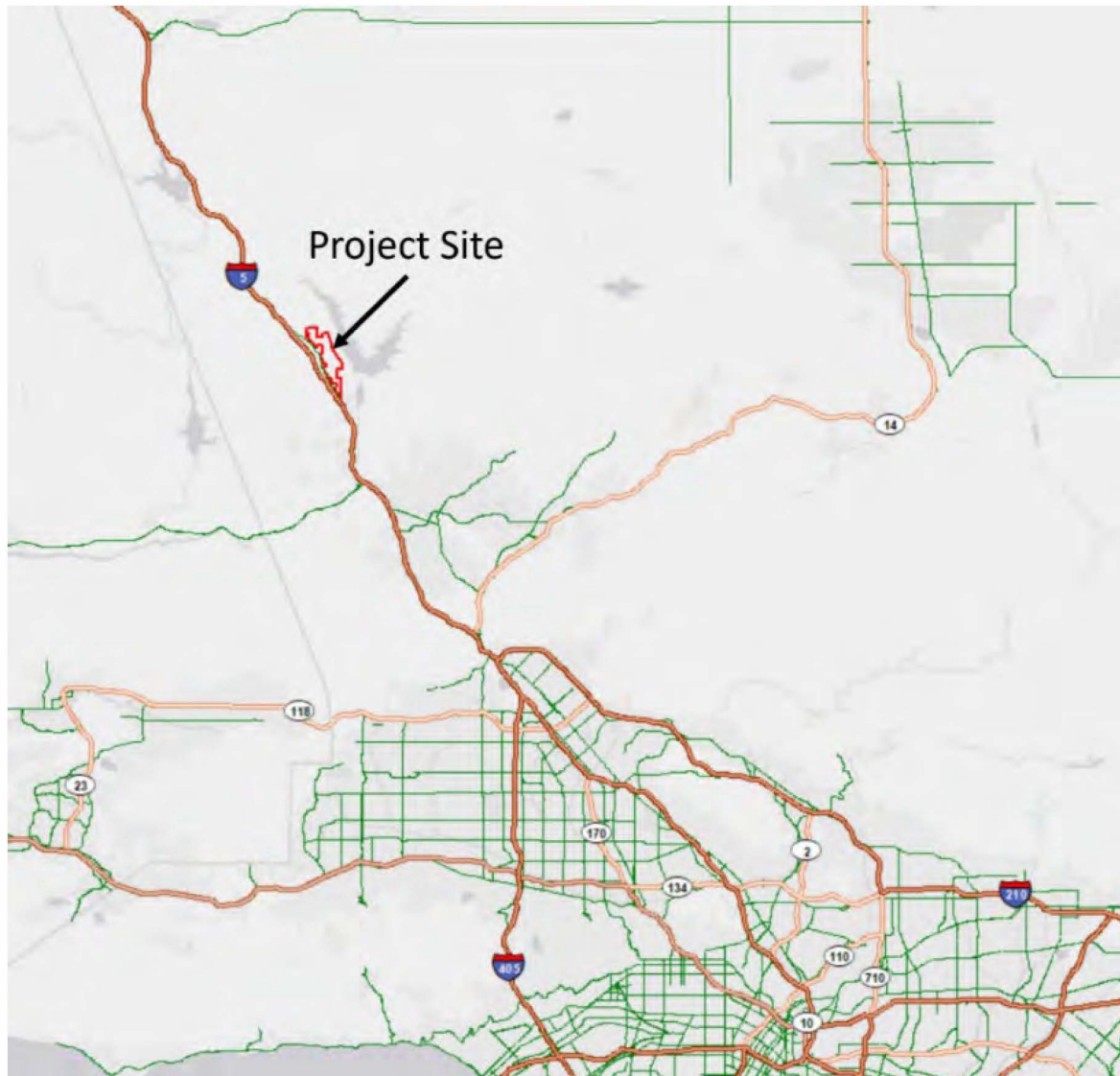


Figure 2 – Regional Location Map

The Project Site has three configurations under review for this analysis. The first is the project as previously approved (Previously Approved Project); the second, a configuration that avoids Grasshopper Creek entirely (Creek Avoidance Alternative); and the third configuration which partially avoids the Grasshopper Creek areas (Partial Creek Avoidance Alternative).

Each of these configurations (which are further broken down into planning areas) have different impacts as it relates to wildfire risk and will be analyzed as such. Each configuration is described in detail as follows:



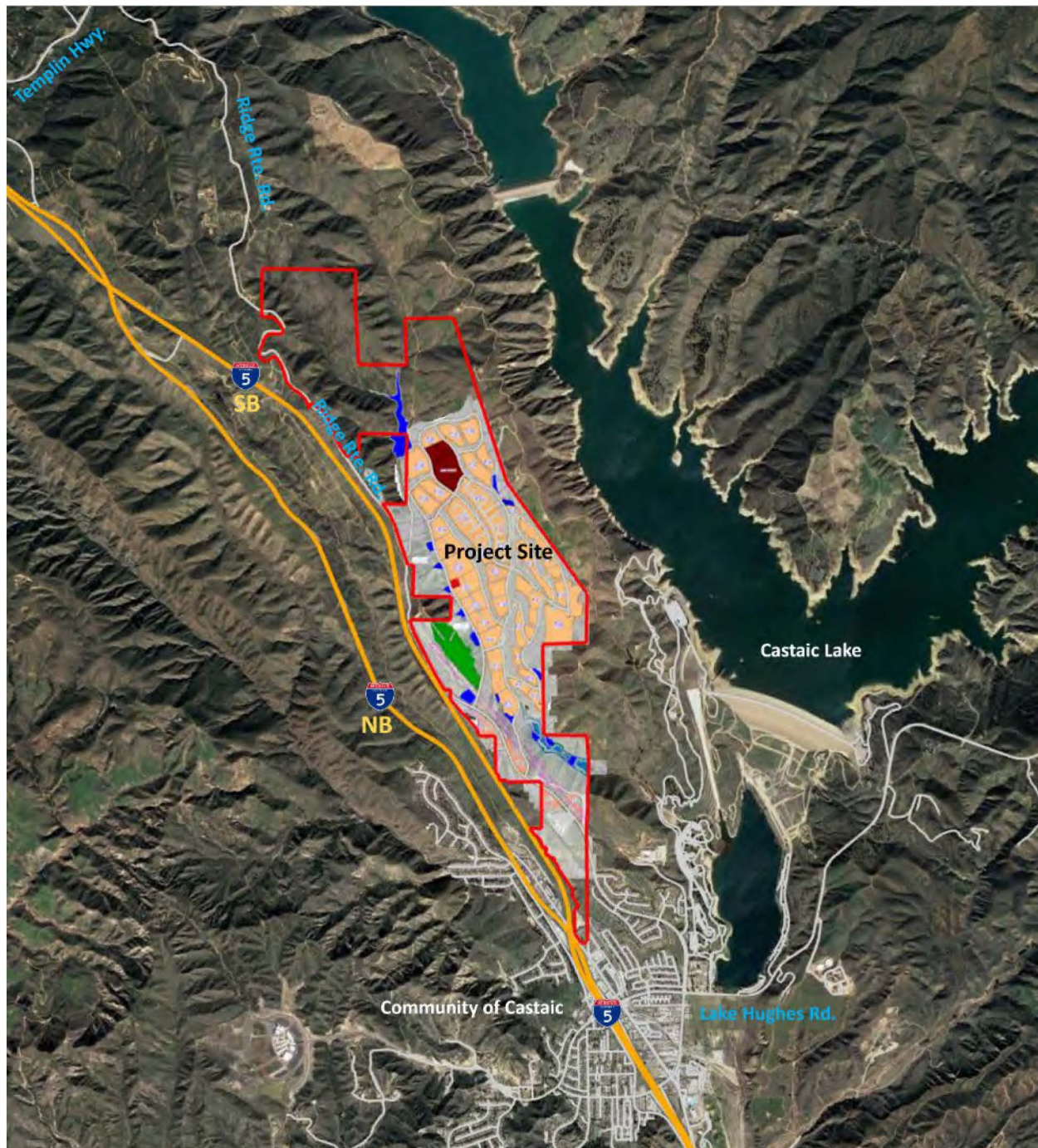


Figure 3 – Vicinity Map



### Previously Approved Project

The project analyzed in the 2017 Supplemental Environmental Impact Report (SEIR)(decertified) would implement the previously adopted NorthLake Specific Plan (NLSP),

but with a reduction of the area and intensity of physical development and an increase in open space as compared to the NLSP. Specifically, the Previously Approved Project involves the phased development of up to 3,150 residential units, 8.9 acres of commercial uses, 799.5 acres of parks and open space, a 22.9-acre school site, and a 1.4-acre pad for a future fire station. A total of 315 affordable units and 6 market rate live-work units will be provided; 95 of those will be designated as senior-living affordable units.



### Creek Avoidance Alternative (CAA)

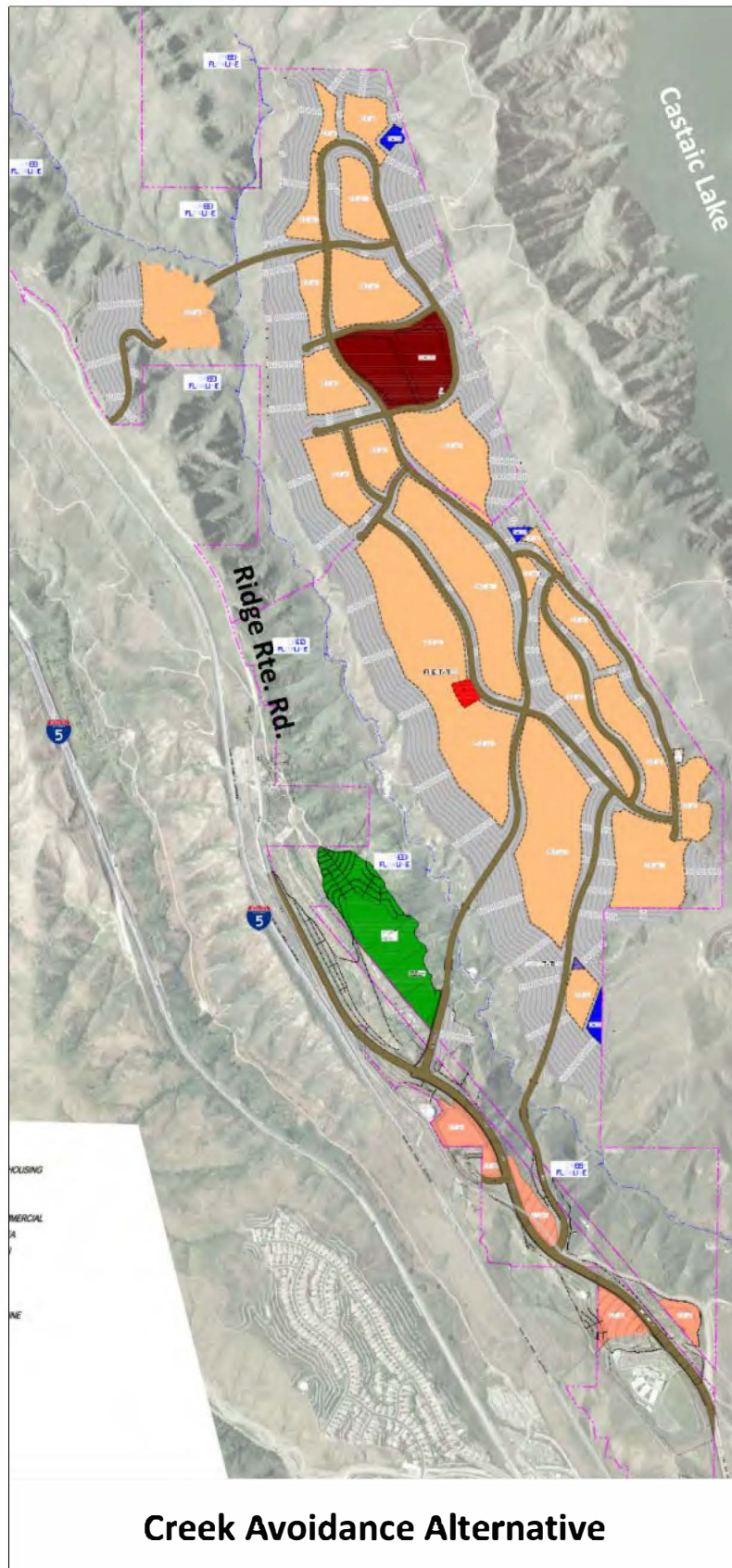
This Creek Avoidance Alternative (CAA) assumes the same design basis as the previously assessed screening alternative in the SEIR (DSEIR, Section 6.5, Alternatives Deemed Not Feasible, Section 6.5.1 Creek Avoidance Alternative): avoid disturbing the creek bottom that runs through the Project Site while developing a viable land plan effectuating the NLSP. The existing landform is created by landslides that traverse the Project Site from the westerly side of Grasshopper Creek (Creek) to the easterly side of the Project boundary.

### Previously Approved Project

Figure 4 – Previously Approved Project Layout

Typically, per standard engineering and design





practices and Los Angeles County requirements, all underlying landslides would be required to be removed and recompacted in order to provide a suitable soil condition for project development. Grasshopper Creek has several existing landslides directly underneath the creek bottom that extend from approximately 10 feet to 200 feet easterly and westerly of the creek bottom.

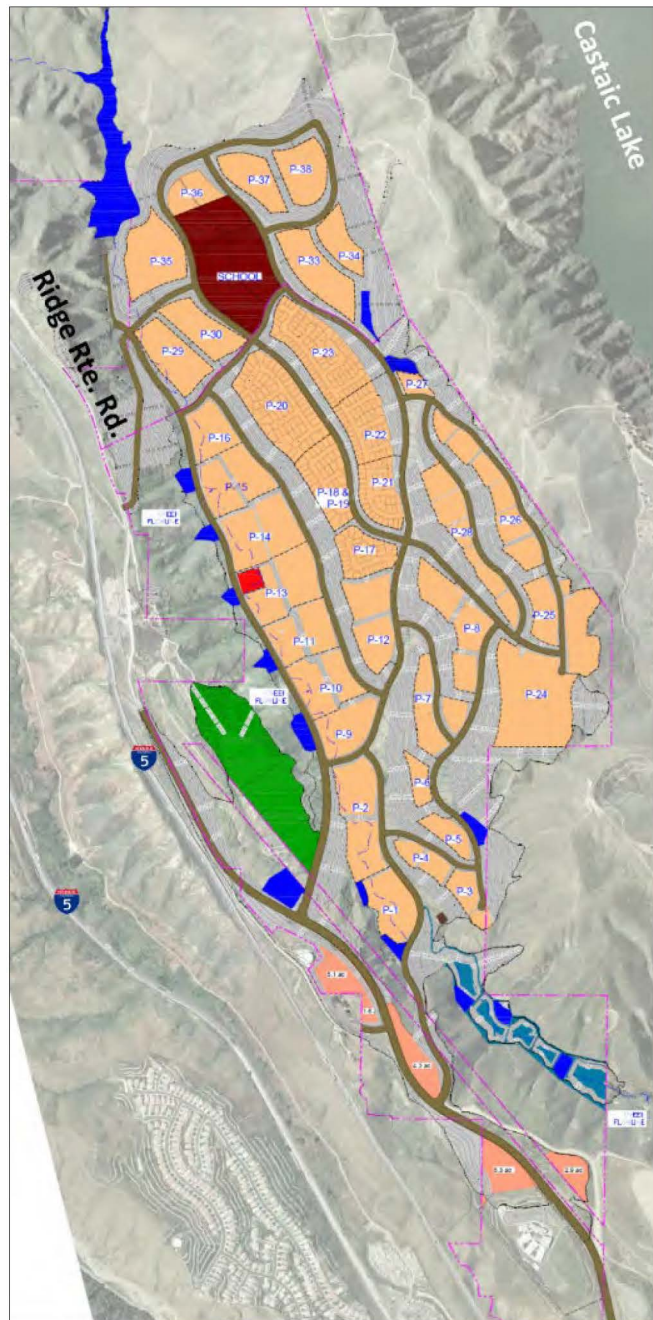
A 300-foot setback was determined to be an appropriate buffer from the creek bottom for the Creek Avoidance Alternative. Thus, the developable area for the Creek Avoidance Alternative will commence at the creek setback line and ascend easterly to the easterly boundary of the Creek Avoidance Alternative. The Creek Avoidance Alternative requires the realignment and new construction of Ridge Route Road. The CAA would require approximately 8.2 million cubic yards of export from the Project Site and the construction of three clear-span bridges to access the project from Ridge Route Road.

The developable acreage for the Creek Avoidance Alternative decreases the developable area from 364 to 286 acres, thereby reducing the amount of area available for development. After incorporating other conditioned site elements such as a 21 acres school site and 1-acre fire station (as per the Specific Plan) along with 167.0 acres of recreation

Figure 5 – Creek Avoidance Alternative Layout

and park areas, under the Creek Avoidance Alternative design, the residential unit count will be reduced to 1,815 (of which 165 units are affordable).

As compared to the 3,150 dwelling units (of which 315 are affordable units and 6 market rate live-work units) under the previously Approved Project, the Creek Avoidance Alternative would result in a reduction of 1,335 dwelling units. The Creek Avoidance Alternative will have similar commercial acreage as the previously approved project. Proportionately, the affordable unit count would be reduced from 315 to 165 units.



**Partial Creek Avoidance Alternative**

Figure 6 – Partial Creek Avoidance Alternative Layout

### **Partial Creek Avoidance Alternative (PCAA)**

The Partial Creek Avoidance Alternative (PCAA) would leave Phase 1 of the Previously Approved Project but reduces scope of the Phase 2 development of the Previously Approved Project. The reduced Phase 2 area design avoids a cluster of smaller and larger landslides in the northern portion of the Phase 2 area. This is proposed to avoid disturbing the landslides and risk additional loss of Creek area (similar to the issues with the CAA). This alternative design would preserve both a portion of the Creek and sensitive habitat within Phase 2 area of the Project Site.

This alternative provides a balanced site within the proposed Phase 2 grading footprint and does not require any additional import or export of soil similar to the Previously Approved Project, while reducing the total disturbed area in Phase 2 by 61%, thereby creating additional undisturbed open space. It also reduces the impacts to that portion of the Creek on the Project Site by approximately 20%.

Furthermore, this alternative significantly reduces the raw earthwork of Phase 2 by approximately 10 million cubic yards. The alternate design maintains the Previously Approved Project unit count of 3,150.

The PCAA includes the agreed affordable component of 315 affordable units and 6 market rate live-work units, mixed-use, and



live-work units, and preserves the school and fire station sites, commercial sites, and the sports park, all of which were provided in the Previously Approved Project and remain unchanged in this alternate design.

When viewed side-by-side, the impacts of the two alternatives are more readily visible, as shown below (Figure 7). The Partial Creek Avoidance Alternative will not develop to the north as much as the other two alternatives.

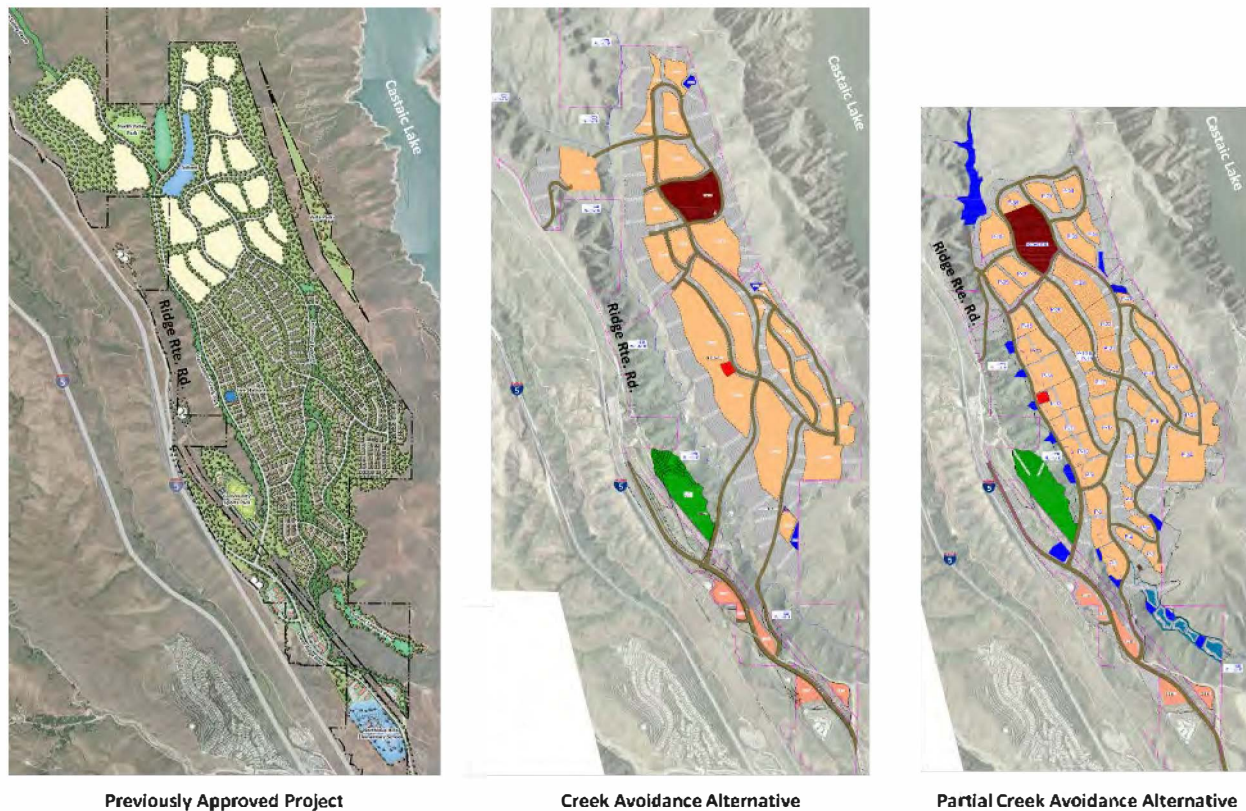


Figure 7 – Comparison of three layout alternative

## Current Environmental Conditions

### General Location of Site and Adjacent Wildland

The Project Site will have undeveloped natural areas on all sides of it. While these areas do have roads, infrastructures, recreational facilities, and a few structures, the area immediately adjacent to the Project Site development area will be native or natural open space areas. Figure 8, on the next page, provides an illustration of the general vegetation classifications around the Project Site as provided in the latest data available from the Landfire Database site supplied by the United States Forest Service (USFS) and Department of the Interior (DOI) at <https://landfire.gov/index.php>.

The interface is primarily Herbaceous (grasses) and Shrublands (chaparral/brush). To the east is Castaic Lake which provides a non-burnable barrier to fires driven by NE or E winds. To the west is Interstate 5 which can provide opportunities for fire suppression activities but, as will be

discussed in a later section, does not provide a guarantee of success in stopping a fire under wind-driven conditions as indicated by the area fire history.

In Figure 8 below, the orange areas are mostly seasonal grasslands, and the brown areas are shrublands or chaparral. In Figure 9, on page 15, the vegetation classification is shown down to the EVT (Existing Vegetation Type). Again, the orange areas are mostly grass. The brown areas are now divided between the lighter brown (Buckwheat/Sage) and the darker brown (Chaparral) where the heavier of the two fuels (Chaparral) increases as the topography moves north (higher). Before transitioning out of the Sage/Buckwheat, the area to the east and northeast of the Project Site has the heavier fuels on the north aspects and lighter fuels on the more southern aspects where the ridgelines run west/east in the orientation.

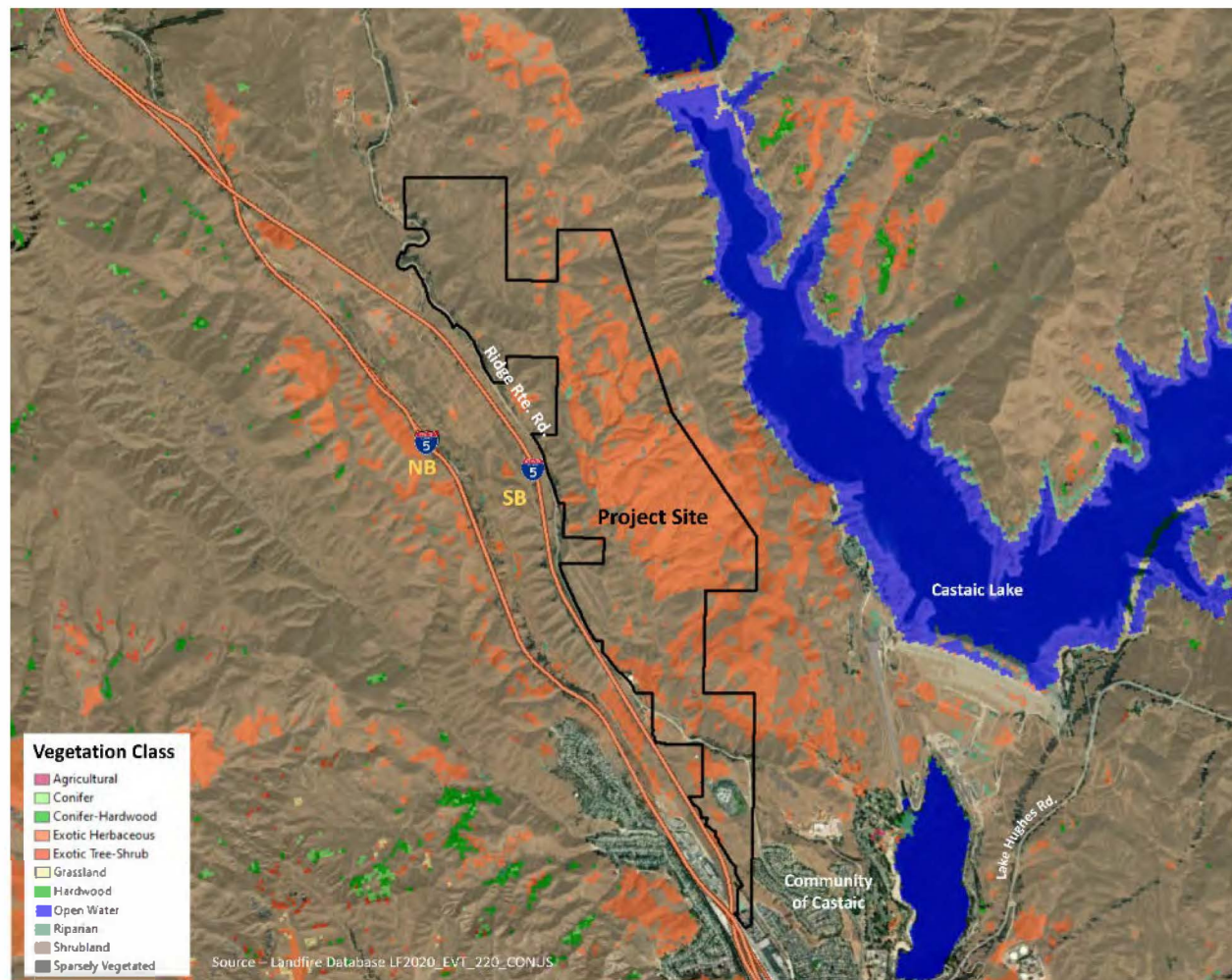


Figure 8 – Vegetation Classification Map

Wildland vegetation (fuel) is relatively homogeneous within the future interface at the Project Site boundaries (at the edge of the development area). Some canopy vegetation (mostly oak trees) exists, primarily in the bottoms of larger drainages.

Figure 10, on page 16, provides a detailed accounting of the vegetation types on the Project Site as provided by the SEIR. This assessment, while more specific, agrees with the Landfire data



indicating the interface is primarily shrubland with grasslands. Much of the grassland within the Project Site will be within the development area.

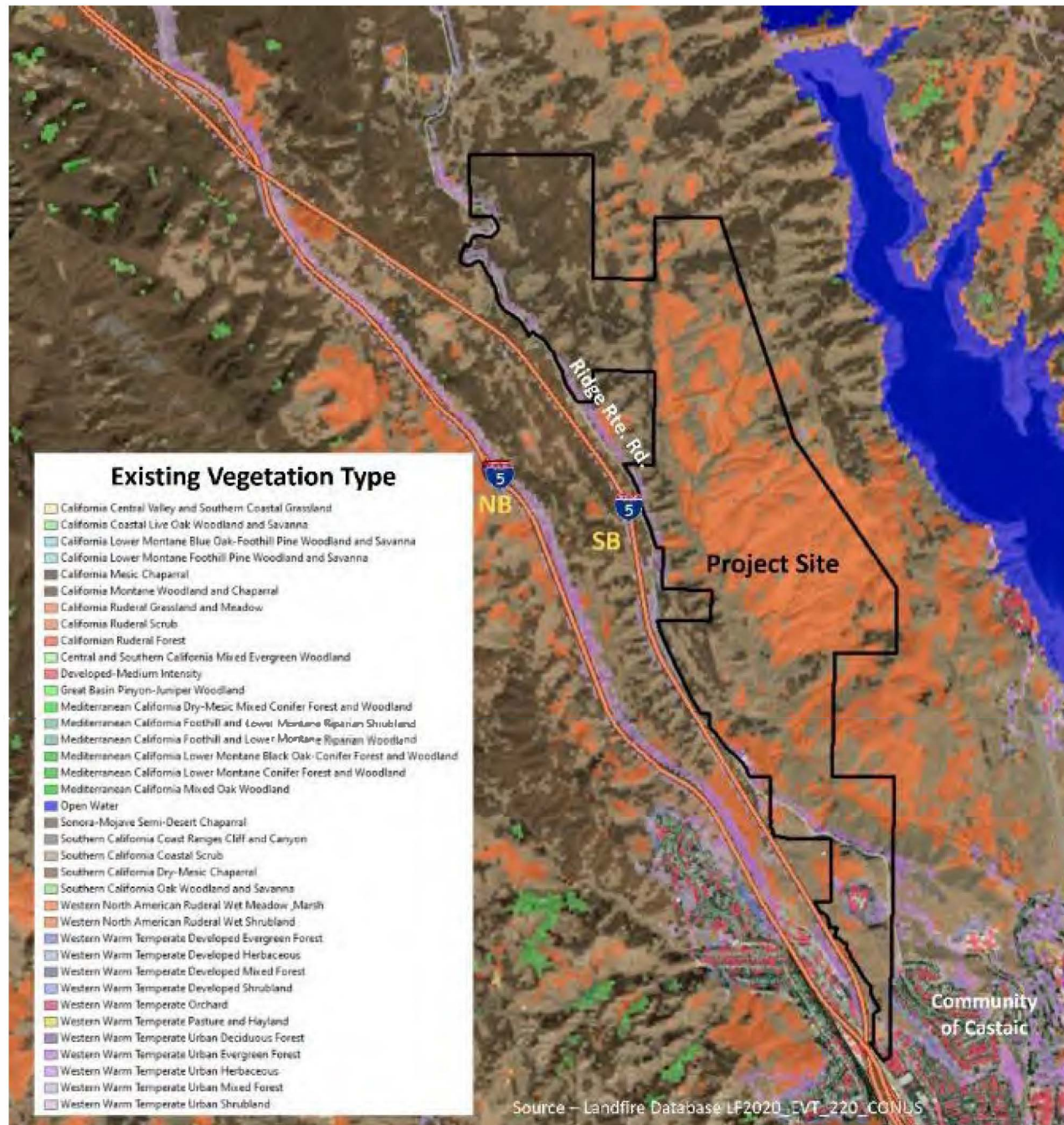
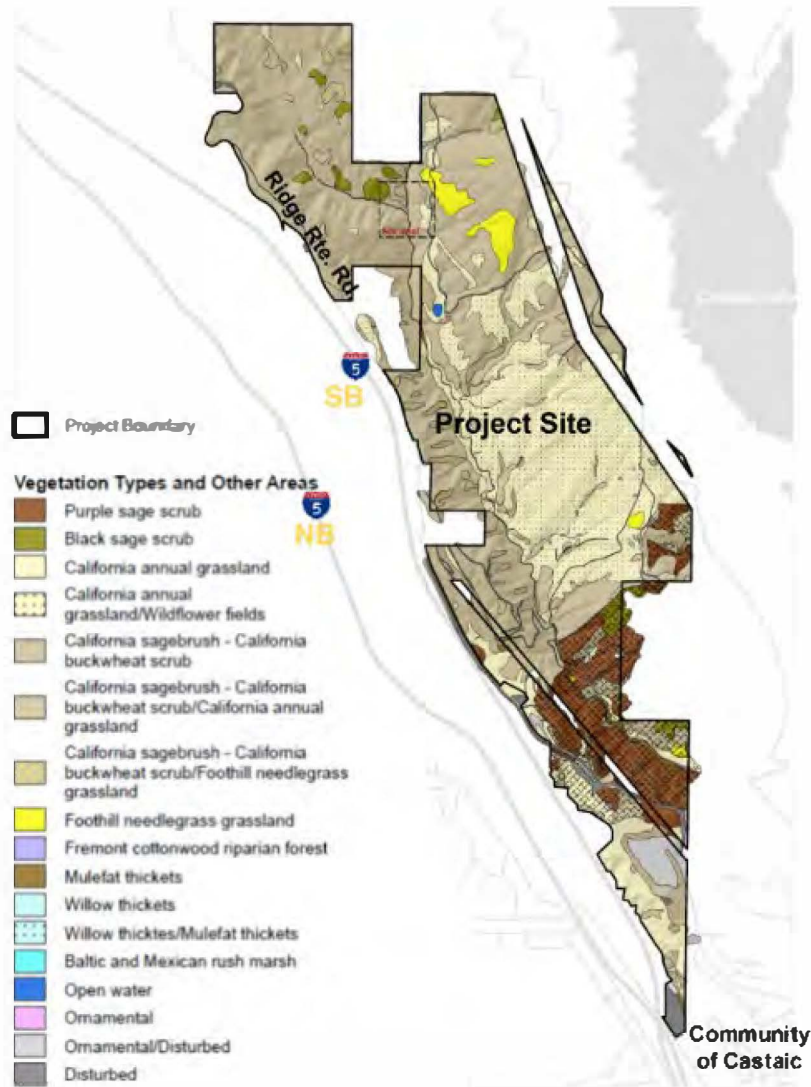


Figure 9 – Existing Vegetation Type Map

To the east of the Project Site is the Castaic Lake State Recreational Area. This area contains boat ramps, day-use facilities, campgrounds, and support buildings/structures for the County staff who operate the facility. This area is shown in Figure 11.

The Project Site has three significant utility easements which run through the site. On the east side is a power line easement for the Los Angeles Department of Water and Power; through the center is an existing oil pipeline which will be relocated by the project, and to the southwest and west is another powerline easement belonging to Southern California Edison (SCE). The powerline easements will remain in the same general area that they currently exist, with some minor tower relocations on the SCE line. The location of all three is shown in Figure 12 on the next page.



Source - NorthLake Specific Plan Project, Draft Supplemental Environmental Impact Report, Vegetation Types and Other Areas, Exhibit 5.2-1.

Figure 10 - Vegetation Type from SEIR

The powerlines will be addressed later in this document as they pertain to wildland fire hazard/risk and evacuation. The relocated pipeline will not be a factor in either the hazard/risk analysis or in the evacuation discussion as it will be buried to a depth that will make it unaffected by a wildland fire.



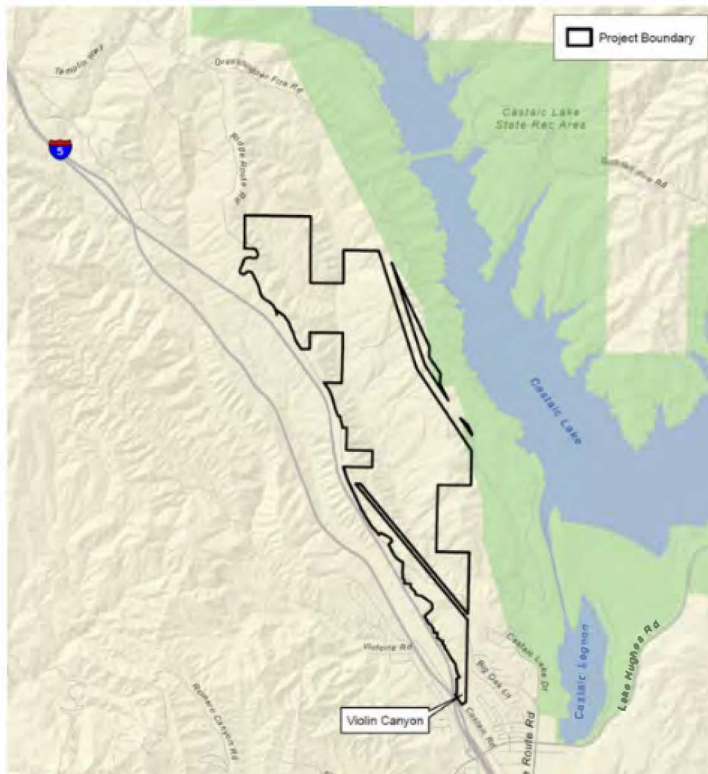


Figure 11 – Castaic Lake State Recreation Area Map



Figure 12 – Project Site Utility Easements

Grasshopper Creek runs through the Project Site and is the subject of the two alternatives provided in the report. This is a seasonal creek and only holds water during wet periods.

This drainage is called an intermittent stream, which is a United States Geologic Survey (USGS) designated “blueline” watercourse.

Figure 13, on the next page, shows the Creek as it exits the Project Site on the south, and Figure 14, also on the next page, shows the upper reach of the watercourse at north end of the Project Site.

While the Creek has some vegetation in the bottom of the watercourse, not present in the general landscape around it, the volume and nature of this vegetation will not add to the wildland fuel load beyond that which is already present in the chaparral fuels.

The 2023 Fire Plan for the County of Los Angeles Fire Department states; *Much of the Santa Clarita Valley and the Santa Monica Mountains have the following vegetation types: coastal sage, riparian, oak woodlands, and chaparral.*

*Coastal sage communities are typically found in lower elevations and drier sites of coastal south-facing slopes. Various plants include purple sage (Salvia leucophylla), California sagebrush (Artemisia californica), coast buckwheat (Eriogonum latifolium), laurel sumac (Malosma laurina), and lemonade berry (Rhus integrifolia).*

*Riparian communities are woodlands with multi-layered vegetation, including Arroyo willows (*Salix lasiolepis*), California black walnut (*Juglans californica*), California sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii*), Mexican elderberry (*Sambucus nigra*), California bay laurel (*Umbellularia californica*), and mule fat (*Baccharis salicifolia*). Oak woodlands are found on northern slopes blanketed with coast live oak (*Quercus agrifolia*), valley oak (*Quercus lobata*) in warmer areas, hollyleaf cherry (*Prunus ilicifolia*), California bay laurel (*Umbellularia californica*), coffeeberry (*Frangula californica*), and poison oak (*Toxicodendron pubescens*).*

*Chaparral communities typically have shrubby vegetation seen on both coastal and inland hillsides and are separated into two types: soft chaparral (usually called coastal sage scrub) and taller, hard chaparral. Chaparral is dominated by evergreen and drought deciduous shrubs one to fifteen feet tall. Most plants are recognized by tough, leathery leaves that reduce water loss in dry climates. Many chaparral plants contain volatile oils, which produce a strong odor and increase flammability. Common examples include various species of ceanothus (*Ceanothus* spp.), manzanita (*Arctostaphylos* spp.), sage (*Salvia* spp.), sagebrush (*Artemisia* spp.) sumac (*Malosma* spp.), toyon (*Heteromeles arbutifolia*), and chamise (*Adenostoma* spp.).*

*There are also significant oak woodland communities along shaded canyon slopes and riparian communities within streambeds. Streambeds have cottonwoods (*Populus* spp.), willows (*Salix* spp.), and related vegetation requiring more water.*

*Determining wildfire risks in LA County involves assessing fire-adapted chaparral ecosystems, dynamic Mediterranean weather conditions, values at risk, and the fire protection system's ability to respond. The California Strategic Fire Plan employs an intensive assessment process graphically depicting fuels, weather, and assets at risk in a Geographic Information System (GIS) program.*

The project site has many of the vegetation communities listed in the Fire Plan. The photos on the next page are good examples of the those listed above. Figure 13 provides an example of the bottom of one of the streambeds with the vegetation quickly changing to grassland and grass/scrub mixtures where the additional water is not available.

Figure 14 is the classic example of a north slope (aspect) which is covered with chaparral species while the flatter and southern slopes are mostly grasslands. This is explained in more detail later in this report.

The Los Angeles County Fire Department is one of six contract counties (Orange, Los Angeles, Kern, Ventura, Santa Barbara, and Marin), which have executed a contract with the State of California to provide wildland fire protection on State Responsibility Areas (SRA).

The Los Angeles County Fire Department has the responsibility as a contract county to implement the 2018 California Strategic Fire Plan in Los Angeles County. As such, the Department functionally operates as a CAL FIRE unit and is responsible for all Strategic Fire Plan activities within the County. The project site will meet or exceed the fire protection requirements of the Los Angeles County Fire Department.





*Figure 13 – South end of Project Site at the Grasshopper Creek interface*



*Figure 14 – North end of the Project Site at the Grasshopper Creek interface*



Agency responsible for fire protection

The Los Angeles County Fire Department is the service provider to the Project Site and land immediately adjacent. Overall jurisdiction is classified as FRA (Federal Responsibility Area), SRA (State Responsibility Area) or LRA (Local Responsibility Area) as shown in Figure 15, below. FRA is federal land, in this case, a national forest. SRA is land with the State of California for which the state has the primary responsibility for wildland fire protection. In this case, the Los Angeles County Fire Department is in a contractual agreement with CAL Fire to provide wildland fire protection on SRA land that CalFire would normally provide within the wildland areas of Los Angeles County. LRA is land within incorporated cities and unincorporated land within the county which does not meet the criteria for inclusion in the SRA.

In the figure below (Figure 15), the green areas are FRA, the light red areas are SRA, and the yellow areas are LRA. Unshaded areas are not in a wildland responsibility area. However, the Project Site is in and surrounded by SRA lands.

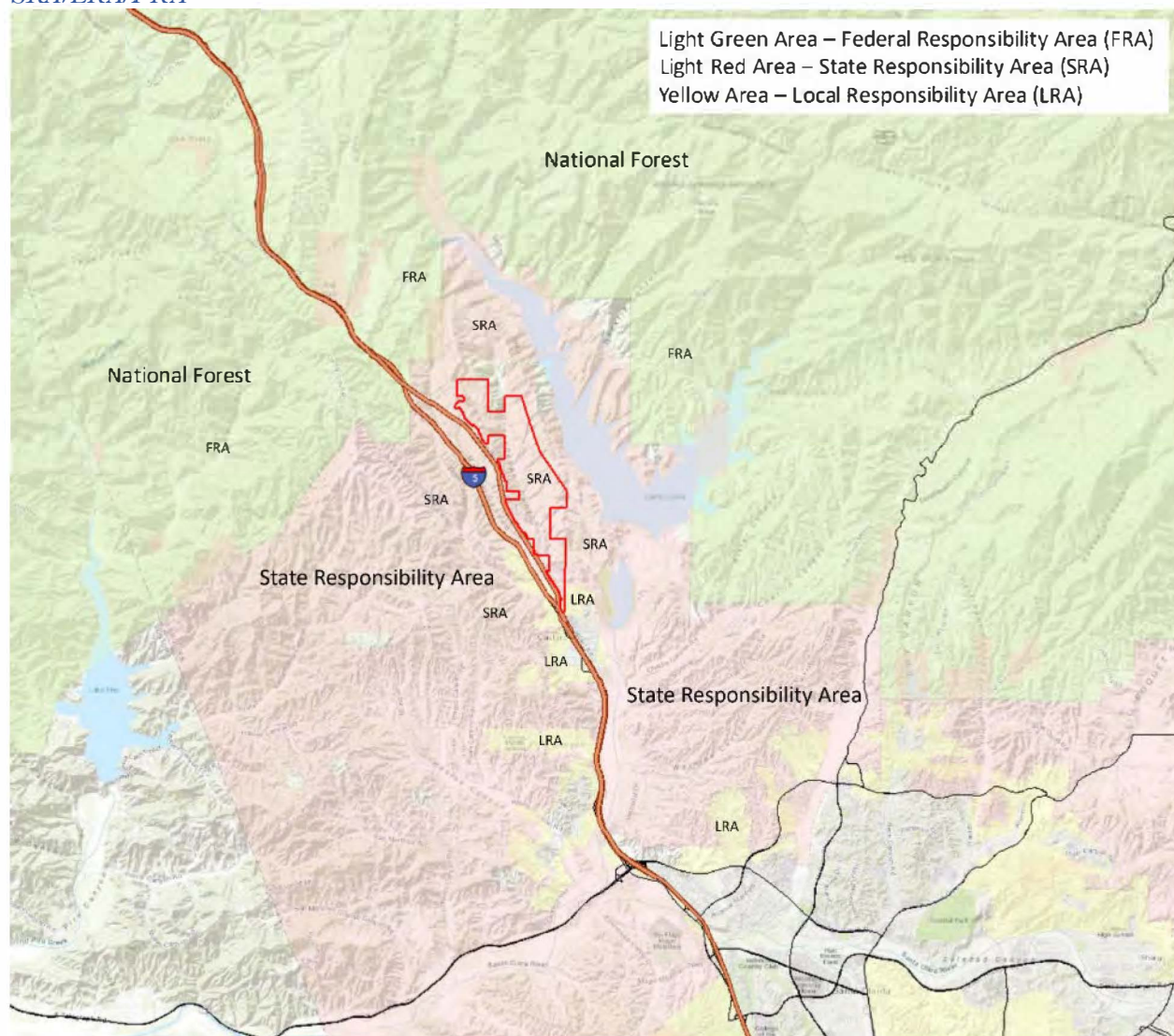
SRA/LRA/FRA

Figure 15 – Map Responsibility Areas (SRA/LRA/FRA)

### *Fire Severity Zones and proximity*

Fire Hazard Severity Zones are currently based on potential fuels, fire weather conditions, and terrain and represent potential fire hazard exposure to structures and other human infrastructure assets. FHSZ areas are adopted as a Title 14 regulation, and fulfill the obligations laid out in Public Resources Code (PRC) Sections 4201-04, and are essential in various fire safety regulations, building construction standards, and real estate hazard disclosure requirements. These zones were initially determined in November 2007 for SRA and September 2008 for LRA. SRA has been revised by CalFire and the LRA update is underway. Some changes are expected in LRA, but the entire Project Site is already at the highest level of wildland risk currently, and have remained so in the updated SRA zones.

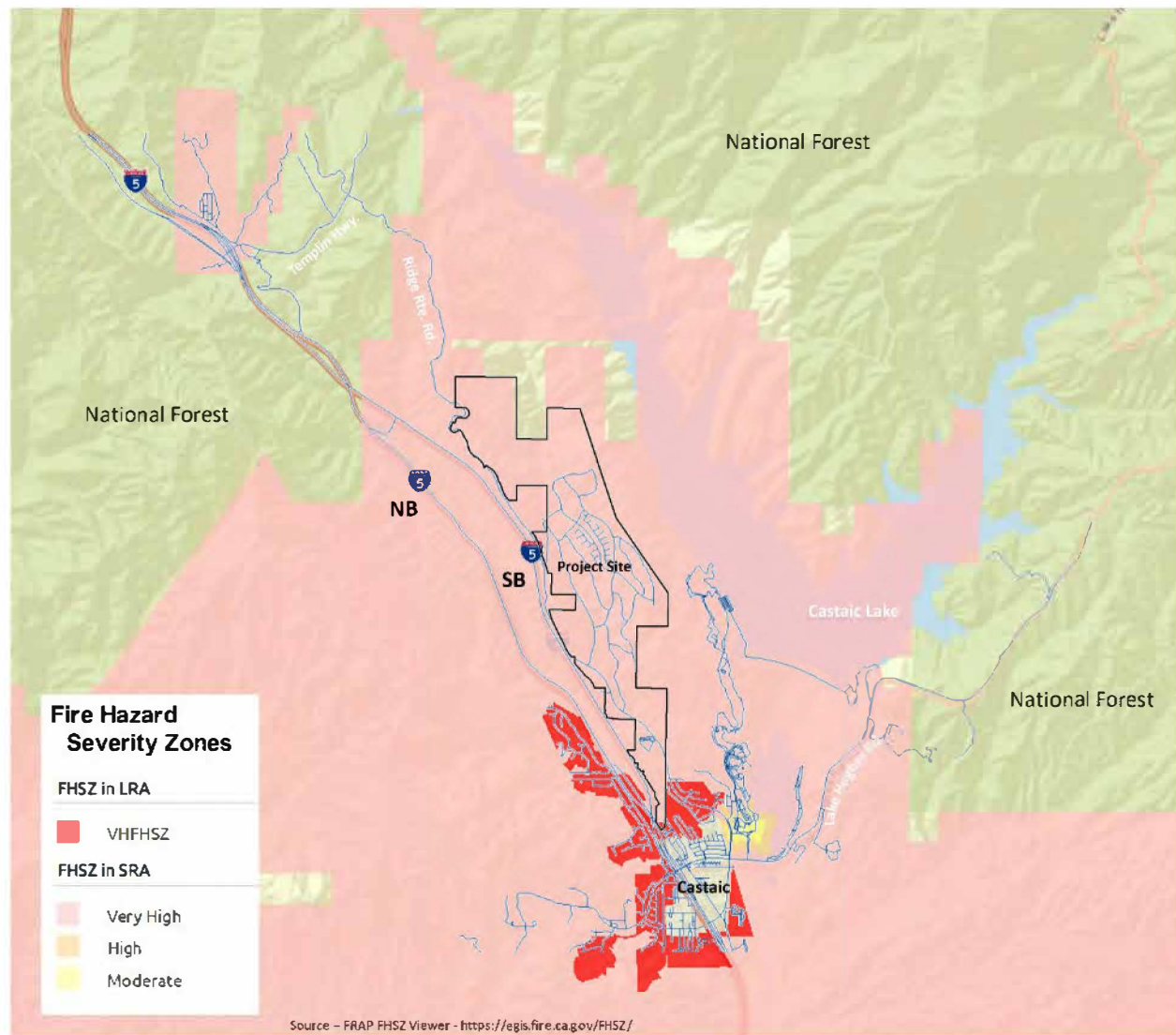


Figure 16 – Fire Hazard Severity Zones (current)

### *Wildland Interface/Intermix*

The wildland urban interface (WUI) is defined by the U.S. Forest Service as any area where “humans and their development meet or intermix with wildland fuel.” This area includes

communities that are within a half-mile of this interface. The WUI is classified into two categories:

1. Interface WUI — where structures are adjacent to the wildland vegetation. A clear line of delineation is provided.

#### Interface



2. Intermix WUI — where structures intermingle with wildland vegetation. Each structure or group of structures has its own interface.

#### Intermix



Source: "Fire FAQs-Are Structures Fuel? The Wildland Urban Interface and the 'Built' Environment", Daniel Leavell, Stephen A. Fitzgerald, Carrie Berger, Gavin Horn, EM 9291 Published August 2020

The Project Site will utilize a WUI Interface for each of the planning areas. Some native areas will remain between planning areas but most of the development will create an area where the only interface with native fuels will be on the perimeter. Figure 7, on page 13, illustrates this well. This is discussed in more detail in the analysis of each alternative.

#### *Codes, guidelines, and standards*

The Project Site will be required to provide protection measures as required by a number of Laws, Codes, Ordinances, Regulations, Guidelines, and Standards (collectively, Regulations). Below are the major Regulations which will impact on the Project Site:

- PRC Sections 4290 through 4299.
- PRC Sections 4201 through 4204 for State Responsibility.
- Title 14 of the California Code of Regulations (14 CCR), Division 1.5, Chapter 7, Subchapter 2, Articles 1-5, "State Minimum Fire Safe Regulations".
- California Code of Regulations, Title 24, Part 9, California Fire Code, Chapter 49 as amended and adopted by the County of Los Angeles.
- California Code of Regulations, Title 24, Part 2 (Volumes 1 and 2), California Building Code, Chapter 7A as amended and adopted by the County of Los Angeles.
- California Code of Regulations, Title 24, Part 2.5, California Residential Code, Section R337 as amended and adopted by the County of Los Angeles.



- Los Angeles County Code, Title 32, Los Angeles County Fire Code
  - Section 503 - Fire Apparatus Access Roads
  - Section 507 – Fire Protection Water Supplies
  - Section 4905 - Wildfire Protection Building Construction
  - Section 4906 - Vegetation Management
  - Section 4907 – Defensible Space
  - Appendix B - Fire-Flow Requirements for Buildings
  - Appendix C - Fire Hydrant Locations and Distribution

The Project Site will have wildland specific requirements before, during and after construction.

#### Prior to Construction

The Project Site will be required to have an approved Preliminary Fuel Modification Plan prior to any subdivision or land; or, have final approval prior to the issuance of a permit for any permanent structure used for habitation (Fire Code Section 4908.1).

#### Protection During Construction

The Los Angeles County Fire Department has adopted Chapter 33 of the California State Fire Code entitled, Fire Safety During Construction and Demolition. This section of the Fire Code provides requirements for “Precautions Against Fire”, Combustible and Flammable Liquids, Flammable Gases and Explosive. Additionally, it requires readily accessible means of reporting emergencies, access roadways and fire department water supplies to all areas where combustible construction is occurring. This section requires the development, implementation and maintenance of an approved, written Site Safety Plan establishing a fire prevention program at the Project Site applicable throughout all phases of the construction, repair, alteration or demolition work. This plan addresses the requirements of the Fire Code, the duties of staff and staff training requirements. The Site Safety Plan must be submitted and approved before the issuance of a building permit. Any changes to the plan must be submitted and approved by the fire department.

#### Protection After Construction

The Project Site is within a Fire Hazard Severity Zone which requires the enforcement of Fire Chapter 49 as amended and adopted by the County of Los Angeles. This chapter provides for increased wildfire building construction protection (maintenance, additions, and remodels compliance wildland standards), vegetation management, defensible space and compliance with an Approved Fire Protection Plan. These requirements provide for the implementation and maintenance of California Building Code Chapter 7A, California Residential Code Section R337 and Californian Reference Standards Code Chapter 12-7A as amended and adopted by the County of Los Angeles. It further requires that building and structures be maintained in accordance with California Public Resources Code Section 4291, California Code of Regulations, Title 14, Division 1.5, Chapter 7, Subchapter 3, Article 3, Section 1299.03; California Government Code Section 51182 and California Code of Regulation, Title 19, Division 1, Chapter 7, Subchapter 1, Section 3.07. The Project Site is also with the SRA which requires it to comply with the SRA Fire Safe Development Regulation as specified in Title 14, Division 1.5, Chapter 7, Subchapter 2. The Project Site will need to be maintained to the same standards and Regulations that were applicable at the time of construction on an ongoing basis.

Public Information and Resident Education

All of the requirements for the fuel modification zones, defensible space requirements, limitations on remodels/additions on the interface lots and community planting restrictions will cover included in the disclosure documents provided to the owners during the escrow process. Additionally, these requirements will be fully detailed in the Project Site CCR's (Covenants, Conditions, and Restrictions) which are legal documents which are filed with the county recorder's office and made a part of the official real estate records that run with the land that is part of the community. The HOA will have a responsibility to inform the residents of the requirements, review and approve changes to the property and provide a process to ensure compliance with the community standard where applicable.



## Project Analysis - Wildfire Hazard and Risk

The analysis of Wildland Risk starts with the review of the hazards, the likelihood of an event, and the intensity of that event which is then examined against the vulnerability (exposure and susceptibility) to provide a “level of risk”.

### Wildfire Hazard

#### Likelihood

Wildfire likelihood is the probability of a wildfire burning in a specific location. At the community level, wildfire likelihood is accessed in the area where housing units are present. The likelihood is the probability that any specific location will experience a wildfire in any given year. Fire history is the main data source for this analysis along with potential ignition sources and weather conditions that lead to extreme fire behavior.

#### Fire History

The Project Site is within/adjacent to a historic fire corridor. When the fire history is viewed in total (all records available) this is evident (Figure 18, next page). On the following two pages are illustrations of the fire history over the past 10, 20 and 50 years to provide some ability to see the data over time. On page 27(Figure 22), is a map of all fires over 50 acres that have occurred

within 7.5 miles of the center of the Project Site since January of 2004. They are listed to the left in Figure 17.

Year	Agency	Unit_id	Fire Name	Alarm Date	Gis Acres
2004	USF	ANF	INTERSTATE	20040625	374
2004	USF	ANF	EAST	20040807	1,337
2004	CCO	LAC	WAYSIDE	20040503	91
2005	CCO	LAC	OAK	20050625	134
2006	USF	LPF	DAY	20060904	161,816
2007	CCO	LAC	BUCKWEED	20071021	38,348
2007	USF	ANF	RANCH	20071020	58,410
2009	CCO	LAC	SLOAN	20090717	82
2009	USF	ANF	ISLAND	20090701	61
2009	USF	ANF	OSITO	20090713	332
2012	CCO	LAC	FIVE MILE FIRE	20120608	489
2013	CCO	LAC	LAKE	20130517	660
2013	USF	ANF	BEE	20130809	206
2013	USF	ANF	POWERHOUSE	20130530	30,268
2015	USF	ANF	WARM	20150816	270
2017	CCO	LAC	LAKE	20170617	733
2017	CCO	LAC	RYE	20171205	6,048
2018	CCO	LAC	CHARLIE	20180922	3,351
2019	USF	ANF	FIVE	20190803	156
2020	CCO	LAC	CASTAIC	20200801	178
2020	USF	ANF	LAKE	20200812	30,999
2020	CCO	VNC	HOLSER	20200817	2,189
2020	CCO	LAC	EQUESTRIAN	20200608	84
2021	USF	ANF	ROUTE	20210911	455
2021	CCO	LAC	NORTH	20210428	552
2022	CCO	LAC	ROUTE	20220831	5,208

Of the 26 fires listed to the left, only three burned onto the Project Site. Five Mile 2012, Lake 2013, and Route 2022. The recent Route Fire was the largest at 5,208 acres. The Five Mile and Lake Fires (2013) were 489 and 660 acres respectively.

One in five fires on the list is a major fire (over 30,000 acres). This represents approximately 20% of the large fires in this area.

The list of large fires spans 18 years, making the regional large fire return interval less than one year, but the Project Site has had all three of its fires in the past ten years, making the site interval over three years.

Figure 17 – Fires in the Project Site area over the past 50 years

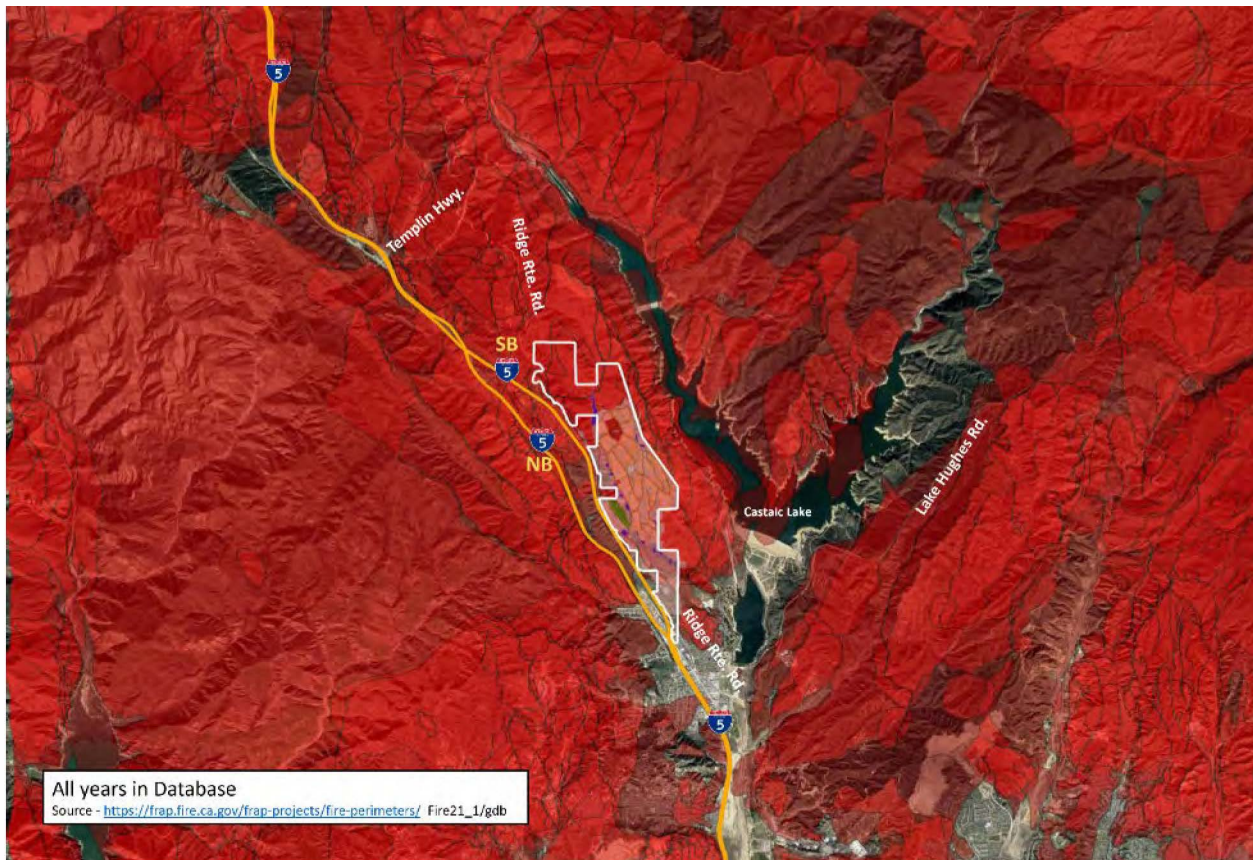


Figure 18 – Fire History for the regional area (all fires/all years)

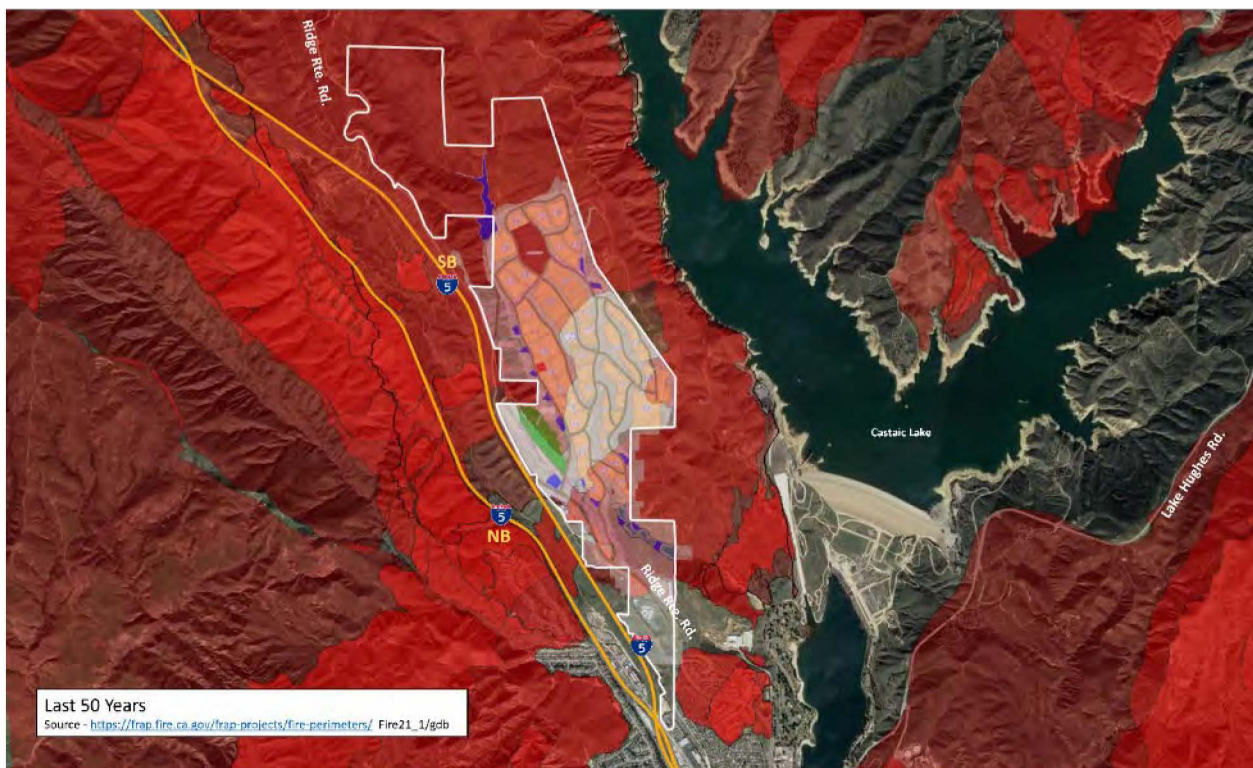


Figure 19 – Fire History for the regional area (past 50 years)



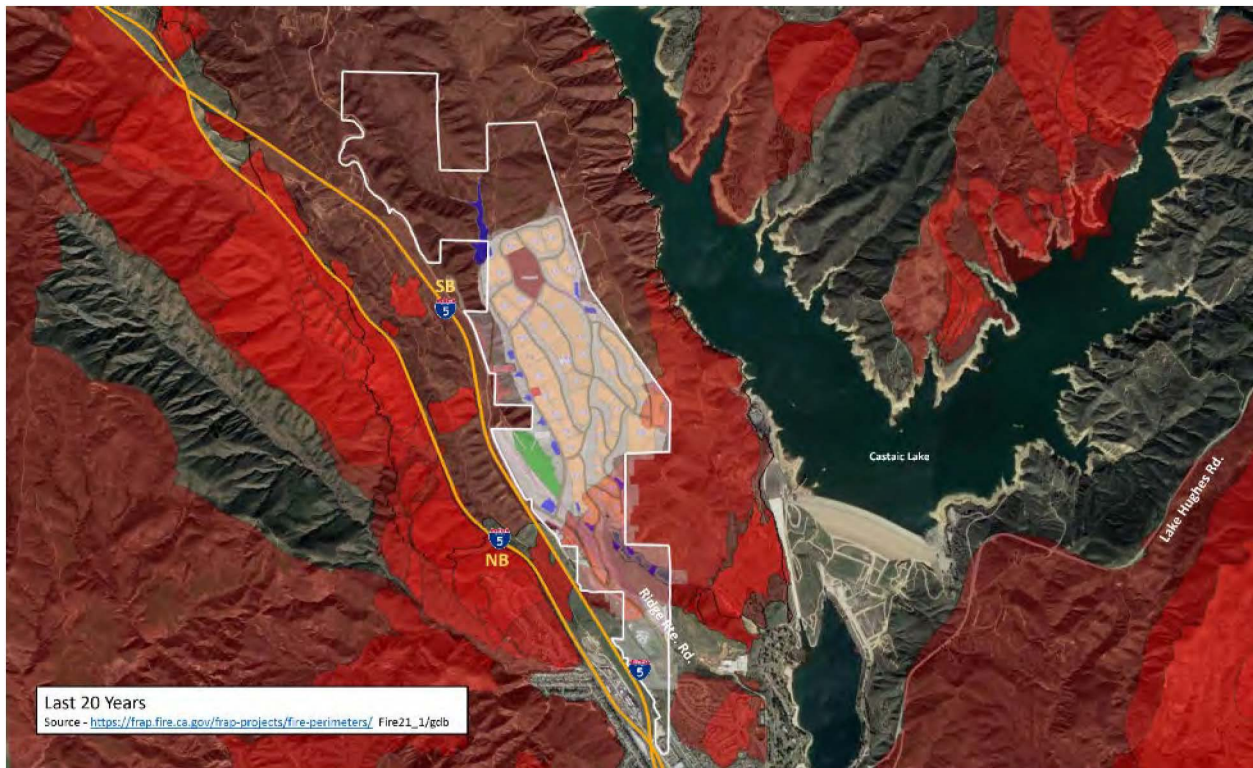


Figure 20 – Fire History for the regional area (past 20 years)

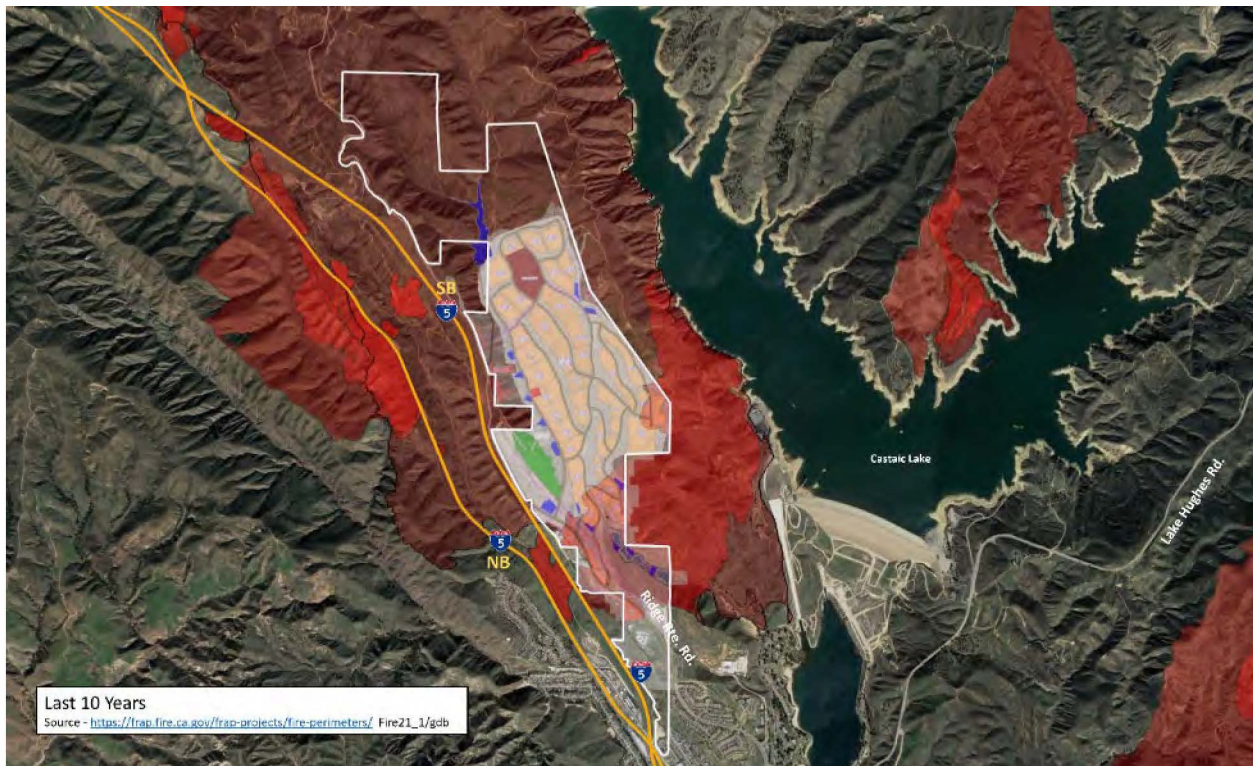


Figure 21 – Fire History for the regional area (past 10 years)



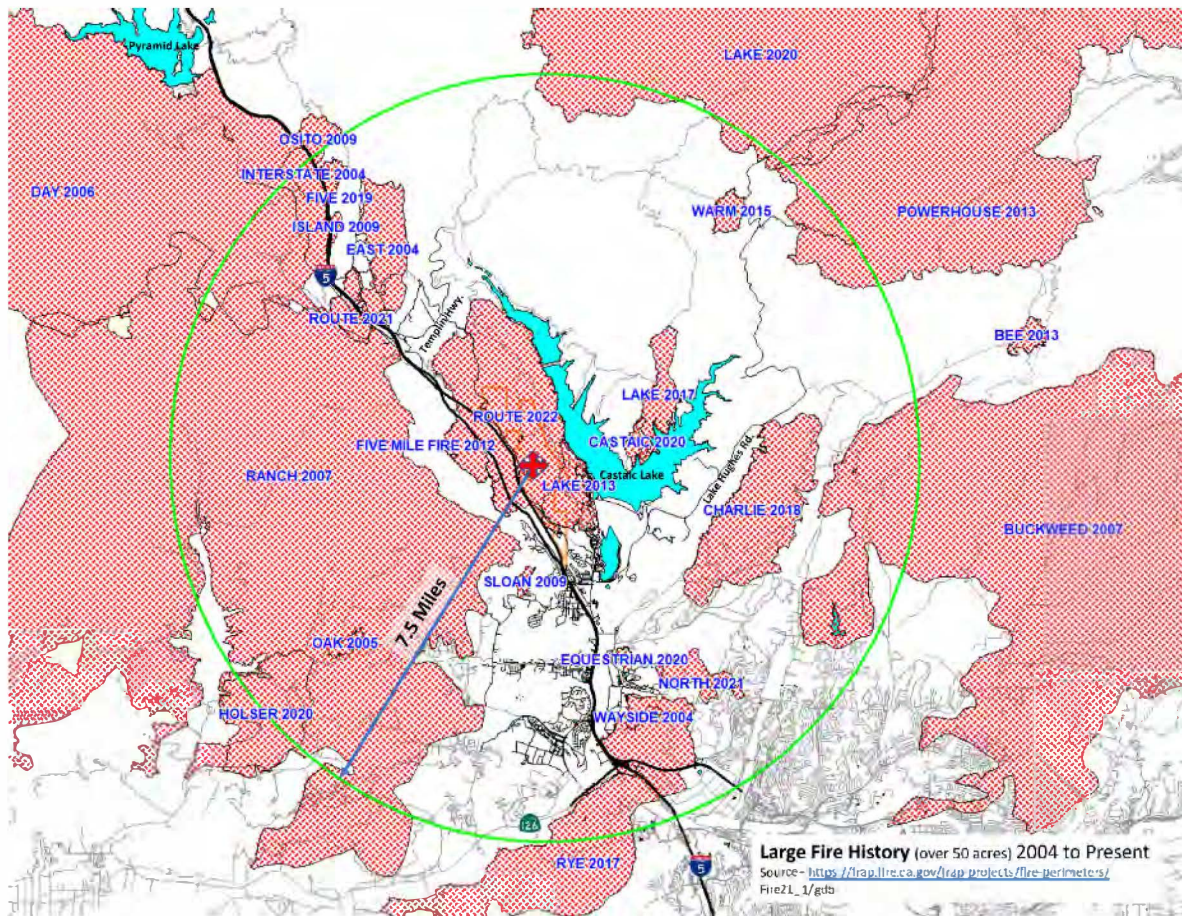


Figure 22 – Large Fire History for the regional area since 2004

Large fires in the area are due to a several issues. Access and topography are part of it. Roads in the lands to the east, west and north of the Project Site have limited access to the areas where these fire burn. The topography is steep and well-vegetated. The general area does not have a large number of fire stations which can arrive quickly in the early stages and fires that occur are generally related to the transportation and infrastructure (powerlines and roads) in the area that provide the ignition sources in many cases. This area is also prone to thunderstorms/lightning which produce strong winds and ignitions without the rainfall necessary to put out the spot fires. All of these factors are covered in more detail later in this report.

The most recent fire to impact the area/Project Site is the Route Fire which started on August 31, 2022. This fire burned approximately 5,208 acres over several days, but the majority of this acreage was consumed in the first operational period (12 hours). The Route Fire started on the west side of the interstate (I-5) at approximately noon. The fire was contained to the west side of the northbound interstate until it carried (spotted) over to the area between the northbound and southbound lanes (large island area) where it quickly established itself and then spotted again over the southbound lanes and into the Project Site. <https://fireaviation.com/2022/10/01/report-shows-use-of-four-helicopter-quick-reaction-force-through-the-night-limited-final-size-of-route-fire/>

Figure 23, on the next page, provides the final fire perimeter, and an outline of the Project Site and indicates the approximate area of origin north of the terminus of The Old Road and North Red Oak Court.



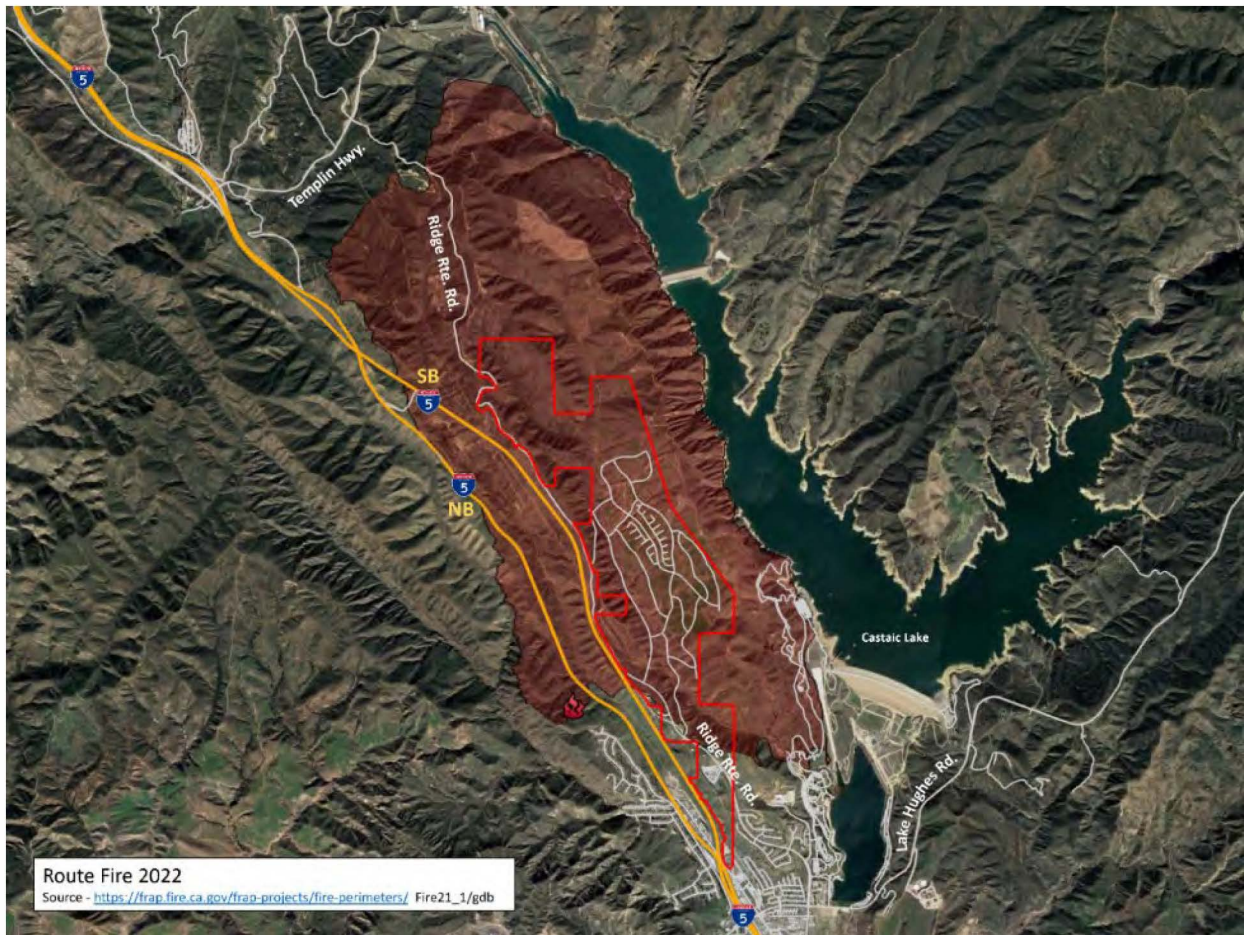


Figure 23 -Route Fire 2022 Map

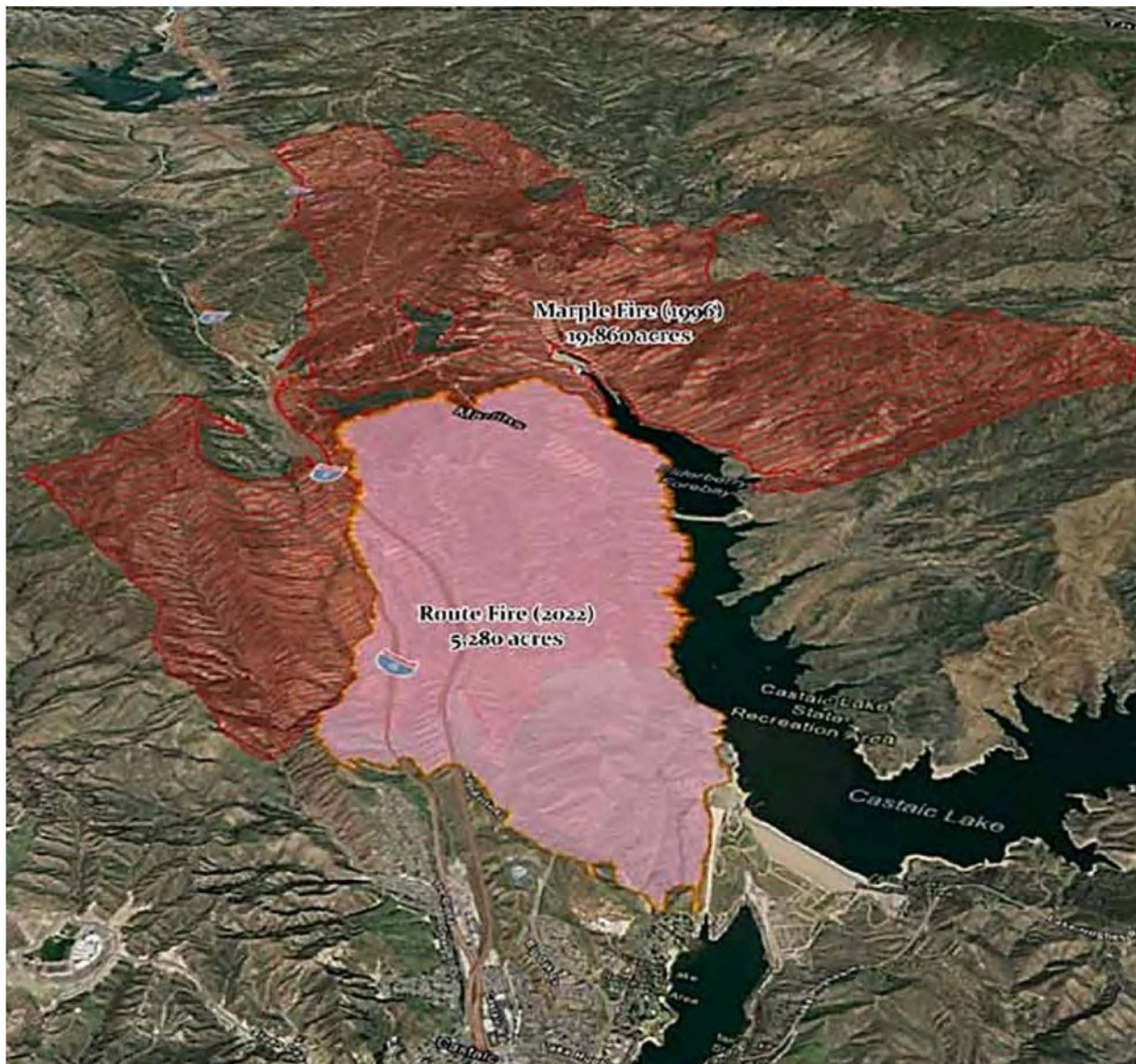
The fire moved quickly once established in both areas (between northbound/southbound and on the Project Site). The SW/SSW wind pushed the fire to the NE/NNE. The fire progression was stopped to the east by Castaic Lake along the entire eastern flank. Aerial tankers and helicopters were used to keep the fire from moving west into Violin Canyon as it had done on the Marple Fire in 1996 (author's personal observation while working on the Marple Fire in 1996). The Marple Fire was the only fire other than the recent Route Fire (2022) to burn over a majority of the Project Site in the past 50 years.

The Route Fire was stopped in the first 24 hours due to the availability of aircraft and the wind change that occurred after, in the evening and the size and abilities of the initial attack forces. It is impossible to directly compare the two fires as the Marple Fire consumed over 10,000 acres in the first eight hours. Both fires started in late August around noon. Once the Marple Fire burned around the north end of the lake, its eastward progress was no longer suppressed. Additionally, the Marple Fire continued to burn for several operational periods subjecting the control line to the diurnal effects of the onshore/offshore changes taking the fire in different directions at different times and requiring resources to be deployed in all areas simultaneously.

<https://fireaviation.com/2022/10/01/report-shows-use-of-four-helicopter-quick-reaction-force-through-the-night-limited-final-size-of-route-fire/> The shifting of the onshore and offshore flow reverses the fire direction under these conditions approximately every 12 hours, making the head of the fire bounce back and forth from opposite sides of the site perimeter.



As the Marple Fire burned into the national forest, containment opportunities were reduced, and suppression methods had to be modified to meet the Forest Service's practices. Within the forest, fire is a natural process, and some suppression efforts actually produce more long-term consequences than the fire itself. The two fires are overlayed in the graphic below (Figure 24). Specifics about the Route Fire (most recent fire to burn over the Project Site) will be covered in each section of this report where applicable.



<https://fireaviation.com/2022/10/01/report-shows-use-of-four-helicopter-quick-reaction-force-through-the-night-limited-final-size-of-route-fire/>

Figure 24 – Comparison of Marple Fire 1996 to Route Fire 2022

### *Weather*

Weather has a significant impact on the ability of a small fire to become a large fire. Within the weather category, wind, relative humidity, temperature, and interaction with the topography are especially impactful.

High temperature, low humidity, and wind combine to create “Fire Weather”. In the area of the Project Site, the regional weather has a strong history of extreme Fire Weather to the point where National Weather Service has a specific system used to identify when the extreme conditions are being achieved and additional action should be taken. On its website, CalFire describes as follows:

*The National Weather Service issues Red Flag Warnings & Fire Weather Watches to alert fire departments of the onset, or possible onset, of critical weather and dry conditions that could lead to rapid or dramatic increases in wildfire activity.*

*A Red Flag Warning is issued for weather events which may result in extreme fire behavior that will occur within 24 hours. A Fire Weather Watch is issued when weather conditions could exist in the next 12-72 hours. A Red Flag Warning is the highest alert. During these times extreme caution is urged by all residents, because a simple spark can cause a major wildfire. A Fire Weather Watch is one level below a warning, but fire danger is still high. [Red Flag Warnings & Fire Weather Watches \(ca.gov\)](https://www.fire.ca.gov/red-flag-warnings-and-fire-weather-watches)*

Extreme Fire Behavior is a term used by the National Wildfire Coordinating Group (NWCG) for conditions which imply a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One or more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.

### *Temperature*

Temperature in and of itself does not have a large impact on fire behavior but the effects of temperature on other factors such as Relative Humidity make temperature important to the fire behavior discussion. More direct sunlight increases fuel temperatures and decreases the amount of heat needed to raise the fuel to its ignition temperature but since most wildland fuels must be raised to over 400°F to sustain combustion, the difference of 10 or 20 degrees in the atmospheric temperature has limited direct effect.

### *Relative Humidity*

Relative humidity (RH) indicates how much moisture is in the air. Expressed as a percentage, it provides an objective measurement of the amount of water vapor that is in the air compared to the amount needed to be saturated (100% RH). When RH is low, moisture can be removed from the vegetation at a high rate creating drier vegetation conditions which burn easily and at a faster rate. Fuels (wildland) are categorized by the amount of time (time lag) it takes them to adjust the plant moisture level to the atmospheric level (63% of the difference) in one-hour, ten-hour,



hundred-hour, and thousand-hour fuels. One- and ten-hour fuels have the most impact on the flaming front (active burning) of wildland fires in grass/brush fuels. *For example, a grass fuel (one-hour) could be at a very high level of fuel moisture (90%) due to overnight fog. When the sun comes up and the fog burns off or a dry air mass moves into the area, if the RH were to drop to 20, then in the first hour, the fuel moisture would move from 90% to 45% (63% of the difference between 90% moisture in the fuel and 20% moisture in the air) in the first hour and down to 30% by the end of the second hour and 24% by the end of the third hour. Each time moving 63% of the difference between the fuel moisture and the air moisture.*

Humidity varies with temperature (generally, when temperature increases, humidity decreases; and vice versa). Humidity is important because it affects fuel moisture content and therefore, the fuel's combustibility. This is the reason that hot, dry Santa Ana wind conditions tend to create Fire Weather and increase the level of risk as they continue to impact the fuels for several days, weeks, or months in the dry season for southern California. Hot, dry, and windy are a bad combination.

### Wind

Wind is the most obvious factor for creating Extreme Fire Behavior. While Extreme Fire Behavior is possible without extreme wind, such as a fuel-driven, plume-dominated wildfire, they are often found together. The Station Fire, in 2009, was a prime example of a fuel and low relative humidity driven fire, with much of the fire growth occurring in the absence of significant winds ([The Station Fire: An Example of a Large Wildfire in the Absence of Significant Winds \(weather.gov\)](#)). This was not what is normally seen in the recent history of fires in Southern California. Wind is normally one of the prime factors. The reason for this is that, in fine fuels like grasses, wind can accelerate the fire to the maximum flame length and Rate of Spread (ROS) with little wind compared to the wind speeds that are possible under fire weather conditions.

One method of illustrating this fact is to show grass wildland fuels (dry climate) at various wind speeds and look for the point at which the fire from a specific fuel reaches its maximum energy output (all fuel consumed; no additional fuel to burn). Using the BehavePlus software from the U.S. Forest Service to complete the comparison, an extreme moisture scenario was used (3% for one-hour fuels, 4% for ten-hour fuels, 5% for 100-hour fuels, 30% for live herbaceous fuels and 50% for live woody fuels) for the fuel moisture levels in the time lag dead and live fuels. Three dry climate grass fuels were used (GR1, GR2, GR4), which are the fuels normally found in southern California for grasses. The results (Figure 25, on the next page) indicate that the GR1 fuel reaches the maximum flame length and ROS at 5 mph (midflame wind speed), while the GR2 fuel reaches maximums at 13 mph and the GR4 at 25 mph. For this example, the 20-foot winds are two times the midflame wind speed. 20-foot winds are defined as sustained winds averaged over a 10-minute period and measured 20 feet above the average height of nearby vegetation. (This is the standard reported by the Remote Automated Weather Stations (RAWS) owned by land management agencies and used in the National Fire Danger Rating System (NFDRS)). Using the 20-foot winds at two times the midflame wind speed allows for the perspective of how little wind is needed on a flat plain. When the slope is added, the GR1 is at maximum without wind, the GR2 drops to 9 mph and the GR4 drops to 22 mph. Figure 25 provides the output from the Behave modeling for this example.

Max ROS Head Fire Surface Fire Flame Length (ft)				Max ROS with 100% slope Head Fire Surface Fire Flame Length (ft)			
Midflame Wind Speed mi/h	Fuel Model			Midflame Wind Speed mi/h	Fuel Model		
	gr1	gr2	gr4		gr1	gr2	gr4
0	0.6	1.4	2.7	0	2.6	7.6	14.3
5	2.6	6.3	11.8	4	2.6	9.1	17.0
10	2.6	9.9	18.6	5	2.6	9.6	17.9
11	2.6	10.6	19.8	6	2.6	10.1	18.9
12	2.6	11.2	21.0	7	2.6	10.6	19.8
13	2.6	11.6	22.1	8	2.6	11.1	20.8
14	2.6	11.6	23.2	9	2.6	11.6	21.8
15	2.6	11.6	24.3	10	2.6	11.6	22.7
16	2.6	11.6	25.4	11	2.6	11.6	23.7
17	2.6	11.6	26.4	12	2.6	11.6	24.7
18	2.6	11.6	27.4	13	2.6	11.6	25.6
19	2.6	11.6	28.5	14	2.6	11.6	26.6
20	2.6	11.6	29.4	15	2.6	11.6	27.5
21	2.6	11.6	30.4	16	2.6	11.6	28.4
22	2.6	11.6	31.4	17	2.6	11.6	29.3
23	2.6	11.6	32.3	18	2.6	11.6	30.2
24	2.6	11.6	33.2	19	2.6	11.6	31.1
25	2.6	11.6	33.7	20	2.6	11.6	32.0
26	2.6	11.6	33.7	21	2.6	11.6	32.9
				22	2.6	11.6	33.7
				23	2.6	11.6	33.7
				24	2.6	11.6	33.7
				25	2.6	11.6	33.7
				26	2.6	11.6	33.7

Figure 25 – BehavePlus Outputs for Rate of Spread in dry climate grass fuels

The regional area around the Project Site has two (2) Remote Access Weather Stations or RAWS, which are monitored/maintained by a governmental agency to measure, record, and transmit Fire Weather data on a routine basis over extended periods of time. Most of these RAWS sites have been in place for many years, if not decades.

These sites are good for establishing the long-term wind (speed, direction, and gusts), temperature, and RH.

The Del Valle and Saugus RAWS are located to the south of the Project Site. The Del Valle RAWS is approximately 5 miles

to the SSW, and the Saugus RAWS is approximately 8 miles to the SE of the southern boundary of the Project Site. The locations are provided in Figure 26 (next page) as well as four locations closer to the Project Site, three of which are weather stations maintained and monitored by Southern California Edison (SCE) as part of the company's Wildland Fire Safety program and one private weather station which is part of the Citizen Weather Observing Program (CWOP) sponsored by the National Weather Service. The company uses data to make decisions on Public Safety Power Shutoff (PSPS) actions. The data is available to safety personnel and the general public in nearly "real-time". Most of these SCE sites are mounted on utility poles owned by the company.

The RAWS sites have over 10 years of recent data, while the SCE sites have all come online within the past 5 years and some in the area have been installed in the past year (those have not been used here). Of note, the SE129 site was destroyed in the Route Fire (2022). It has data up to the morning of the fire. The other three SCE/CWOP sites and the two RAWS have data through the point at which the databases were downloaded (after the Route Fire).



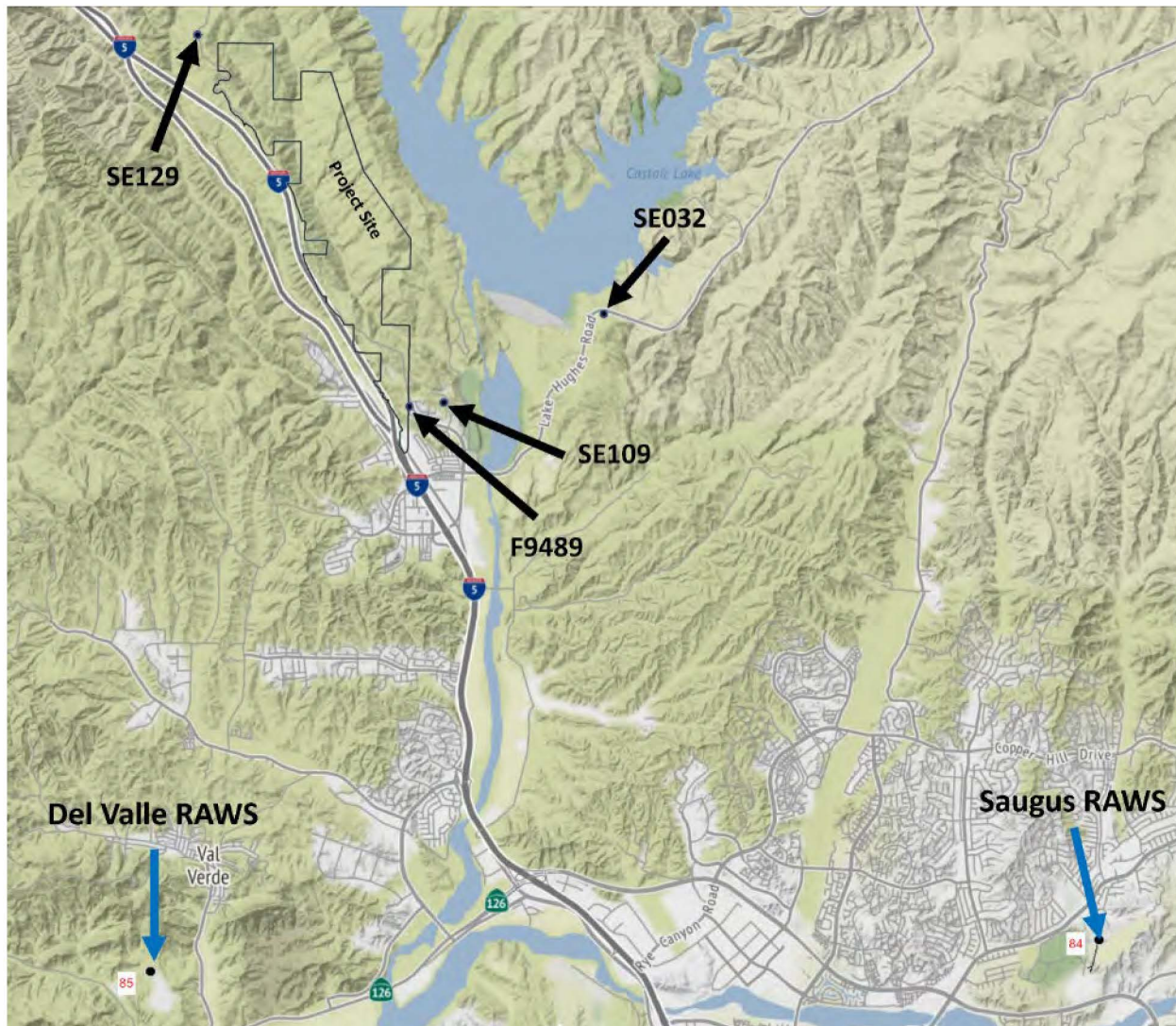


Figure 26 – Location map for location weather collection sites

The data from the RAWS sites shows regional data is fairly consistent. Both sites have the predominant onshore flow (S to W) and the stronger winds from the offshore flow (NW to NE). Both RAWS sites are located in areas that are not wind-protected but are also adjacent to topographic features which have some influence on the direction and speed of the wind. They are at the same general elevation (Del Valle 1,278'/Saugus 1,450'). Each site has over 92,700 datapoints out of 93,504 possible data points within the analysis timeframe (10 years).

Data tables and wind rose graphics are provided for both in Figure 27, on the next page. Both RAWS sites are near the Santa Clarita River drainage and are orientated to topography in a manner that is slightly different from the Project Site.

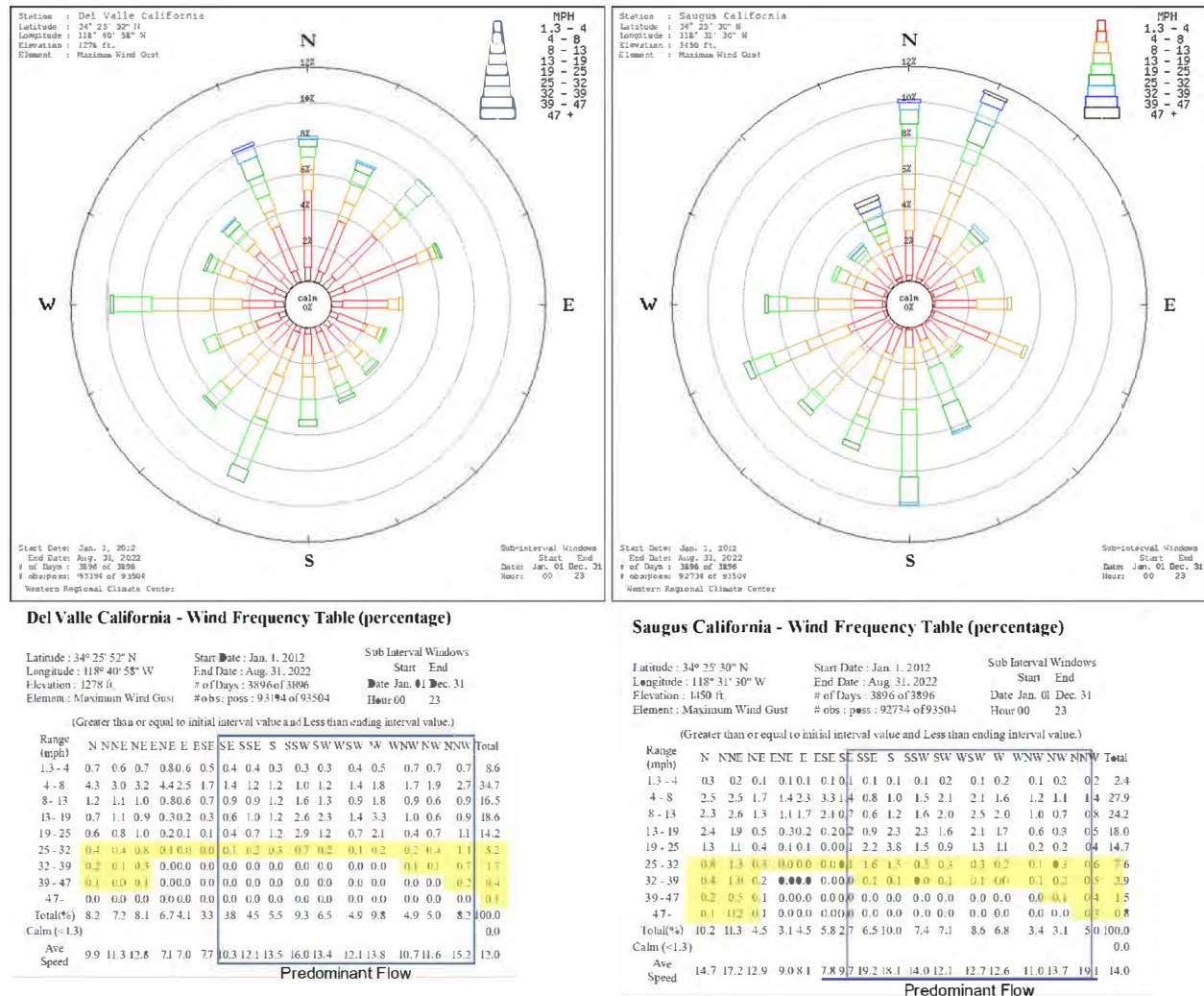


Figure 27 - Output data/graphics for RAWS locations (Del Valle and Saugus)

Using outputs from FlamMap (fire behavior modeling software), it is possible to see how the wind interacts with the topography. In Figure 28, on the next page, the wind directions are imposed over an elevation map (red indicating lower elevations through green indicating higher elevations) to show how the winds are channeled by the mountains and valleys. Note that to the north of Lake Piru (left side of the graphic), wind direction is more impacted in the offshore (NE wind) flow than in the onshore (SW wind) whereas the offshore flow is more impacted in the area of Highway 126 within the Santa Clarita River drainage. This wind channeling effect has an impact on the fire spread direction. When viewing the RAWS data, this is a critical issue to understand. These are the 20-foot winds (wind height) which are adjusted to a midflame wind speed in the modeling. The most radical wind direction changes occur in wind-sheltered or shadowed areas. This issue will be addressed later in this report.

The Project Site is not significantly impacted by either of these two wind directions (Onshore/Offshore) with respect to changes in wind direction at an overall level (wind channeling is not pronounced on or near the Project Site). Site-specific locations may have more localized wind channeling impacts, and these will be addressed later in this report specific to the Project Site and the location being addressed.



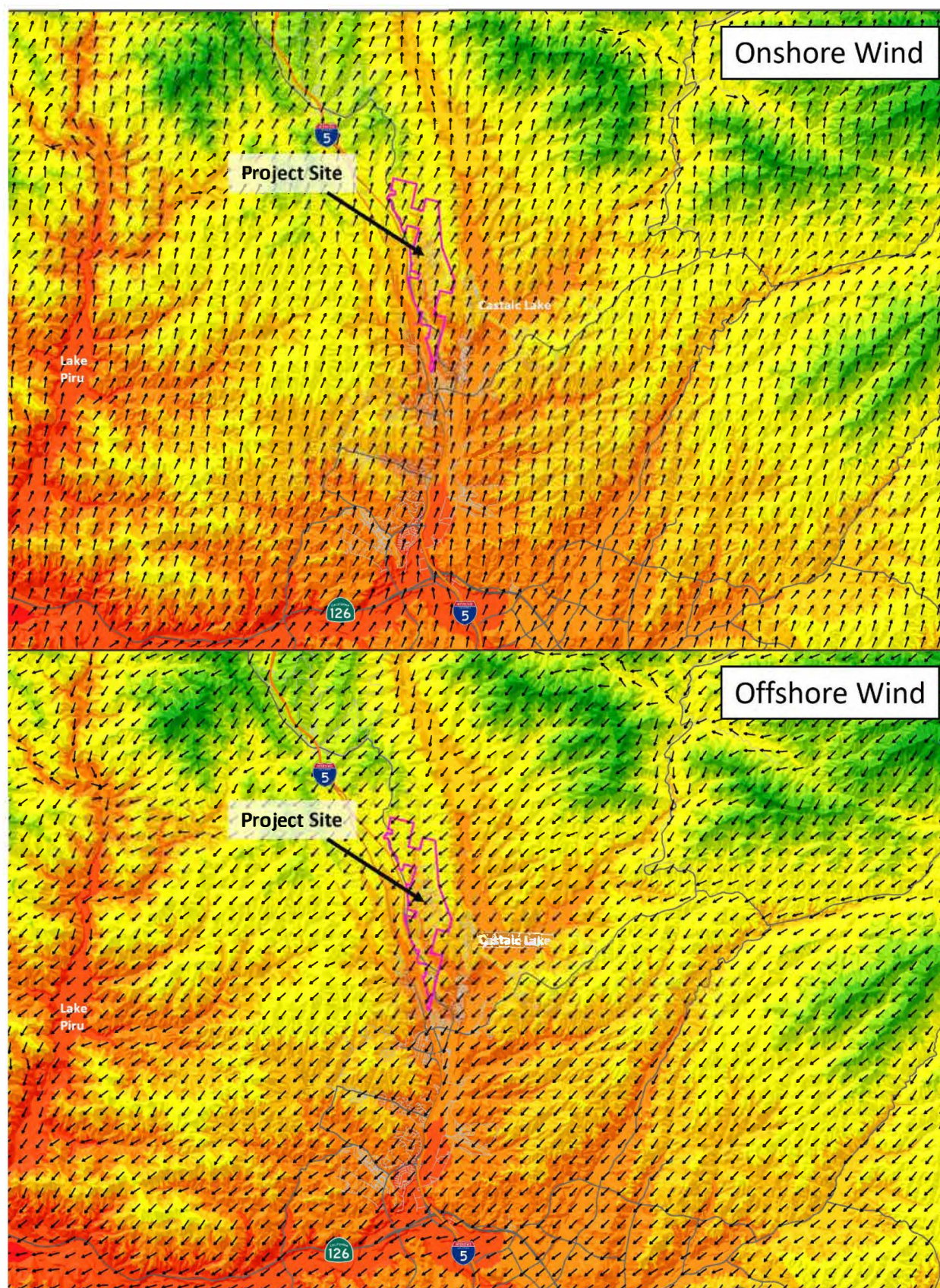


Figure 28 – Onshore/Offshore Winds over the Project Site



Four additional weather data collection points (not RAWs) shown below (Figure 29), provide an understanding of why they will have different wind data from the same time periods as compared to the RAWs sites. SE109 and SE032 are on north-facing slopes while FW9489 is on a south-facing slope and SE129 is on a west-facing slope. All are on a road or near a house. FW9489 is at the top of a slope, SE129 and SE032 are near the top of a slope, and SE109 is about mid-slope but in a narrower canyon than the other three. SE032 is the most exposed (right off the lake), and FS9489 is the most protected, with homes to the north and east of the site. The three SCE sites shown below are mounted on power poles and the FS9489 site is a private weather station that is a part of the CWOP. CWOP runs data checking and analysis on its site to increase the quality of the data.



Figure 29 – Non RAWs weather data locations)



Below, in Figure 30, is a summary of the weather data for the four non-RAWS sites. The highest wind speed and wind gusts are found as SE032, as would be expected given its exposed position. The lowest wind data is provided by FW9489 as discussed previously, due to its protected position and configuration.

All four sites have the minimum and maximum values shown along with the range eliminating the top and bottom 1%. All of these sites have been in place for less than five years with FW9489 only being in service for 1.6 years (data available). SE129 data stops in the morning of the Route Fire 2022 as the site was destroyed by the Route fire and is currently under replacement. All four sites were functioning on the day of the fire and the remaining three continue to function as of this report. Overall, the four locations have very similar findings.

<b>SE129</b>		<b>Temp</b>	<b>RH</b>	<b>Wind</b>	<b>Gust</b>
Average		64.8	43.8	7.3	12.3
Min		32.06	3.24	0	0
Max		110.5	100	35.82	58.3
1% value		38.86	7.66	0.04	0.7
99% value		94.1	99.7	22.79	35.9
183,622 values		Data ends prior to Route Fire			
3.5years					
<b>SE032</b>		<b>Temp</b>	<b>RH</b>	<b>Wind</b>	<b>Gust</b>
Average		64.3	48.0	6.5	10.8
Min		33.6	3.96	0	0
Max		112.1	100	43.4	69.2
1% value		39.63	8.49	0.25	1.2
99% value		95.79	99.4	25.43	37.4
244,161 values					
4.6years					
<b>SE109</b>		<b>Temp</b>	<b>RH</b>	<b>Wind</b>	<b>Gust</b>
Average		65	48	3.1	7
Min		28.8	4.4	0	0
Max		115	99.4	23.5	45.1
1% value		38.8	8.6	0	0
99% value		100.2	96.2	13.3	25.3
203,196 values					
3.9years					
<b>F9489</b>		<b>Temp</b>	<b>RH</b>	<b>Wind</b>	<b>Gust</b>
Average		68.2	45.7	3.8	4.7
Min		32	4	0	0
Max		115	99.0	27	33
1% value		41	9.0	0	0
99% value		100	99	16.0	18.0
168,876 values					
1.6years					

Figure 30 - Weather Data Summaries for non-RAWS locations

The three SCE sites can provide additional insight when the data is processed by direction and speed. Figure 31, on the next page, shows a similar trend with respect to wind direction and speed. SE032 has a maximum wind gust of 69.2 mph, but the 99<sup>th</sup> percentile is 37.4 in Figure 30 and Figure 31 provides the reason. Only five data points exceeded 60 mph, and only 34 datapoints exceeded 50 mph out of 244,161 data events. SE129 has similar data with a maximum gust of 58.3, a 99<sup>th</sup> percentile of 35.9, and only 34 datapoints over 50 mph out of 183,622 data points. Data points within the upper and lower one percent of the database are not

normally used as they tend to represent data outliers which do not fit within the statistical norms. It is not possible to know if these outliers are anomaly or data artifacts (a data flaw caused by equipment, techniques or conditions). Understanding the drop from the peak to the 99<sup>th</sup> percentile or from the minimum value to the 1<sup>st</sup> percentile provides some insight into the nature of the dataset and provides for a more accurate/reliable value for use in presenting the impacts of the dataset on the overall modeling process.

SE032			WindGust(mph)						
% of Total	Count	Cardinal	<20	>20	>30	>40	>50	>60	>70
6.7%	16,415	N	14,491	1,954	179	11	-	-	-
13.6%	33,236	NNE	28,774	4,462	779	58	8	-	-
13.2%	32,113	NE	27,655	4,458	1,358	195	43	4	-
5.6%	13,620	ENE	13,068	552	44	7	2	-	-
2.0%	4,866	E	4,850	16	-	-	-	-	-
1.7%	4,244	ESE	4,244	-	-	-	-	-	-
4.2%	10,348	SE	10,343	5	-	-	-	-	-
4.7%	11,582	SSE	11,569	13	-	-	-	-	-
3.8%	9,265	S	9,233	32	1	-	-	-	-
8.2%	20,033	SSW	19,236	797	24	-	-	-	-
15.1%	36,966	SW	35,417	1,547	48	4	-	-	-
4.4%	10,726	WSW	10,596	130	-	-	-	-	-
1.5%	3,735	W	3,702	33	2	-	-	-	-
2.2%	5,431	WNW	4,921	510	77	9	-	-	-
7.1%	17,336	NW	8,243	9,093	3,113	419	15	-	-
5.7%	13,816	NNW	7,536	6,280	3,088	644	34	1	-
0.2%	399	Null	-	-	-	-	-	-	-
100.0%	244,161		213,878	29,882	8,713	1347	102	5	-
			87.6%	12.2%	3.6%	0.6%	0.0%	0.0%	0.0%
Offshore winds are highlighted in light red, and the Onshore winds in light yellow									
SE129			Wind Gust (mph)						
% of Total	Count	Cardinal	<20	>20	>30	>40	>50	>60	>70
7.8%	14,385	N	13,373	1,013	267	17	-	-	-
3.6%	6,678	NNE	6,224	454	18	-	-	-	-
5.7%	10,458	NE	8,267	2,191	244	11	-	-	-
6.6%	12,085	ENE	11,264	822	77	15	1	-	-
4.5%	8,205	E	8,137	68	5	-	-	-	-
3.2%	5,908	ESE	5,881	27	2	-	-	-	-
3.2%	5,907	SE	5,867	40	-	-	-	-	-
5.5%	10,178	SSE	10,133	45	1	-	-	-	-
8.1%	14,905	S	14,563	342	4	-	-	-	-
13.1%	24,127	SSW	22,665	1,462	22	-	-	-	-
3.6%	6,697	SW	6,397	300	15	-	-	-	-
1.5%	2,780	WSW	2,687	93	5	-	-	-	-
1.3%	2,300	W	2,124	176	4	-	-	-	-
3.0%	5,461	WNW	4,204	1,257	226	19	-	-	-
14.4%	26,470	NW	13,277	13,193	2,975	345	20	-	-
14.0%	25,658	NNW	17,899	7,759	2,441	266	13	-	-
0.8%	1,418	Null	-	-	-	-	-	-	-
100.0%	183,622		152,962	29,242	6,256	673	34	-	-
			83.3%	15.9%	3.4%	0.4%	0.0%	0.0%	0.0%
Offshore winds are highlighted in light red, and the Onshore winds in light yellow									
SE109			Wind Gust (mph)						
% of Total	Count	Cardinal	<20	>20	>30	>40	>50	>60	>70
3.9%	7,967	N	7,820	147	4	-	-	-	-
2.3%	4,595	NNE	4,568	27	-	-	-	-	-
2.8%	5,647	NE	5,469	178	3	-	-	-	-
5.6%	11,421	ENE	9,599	1,822	168	15	-	-	-
4.1%	8,317	E	7,754	563	20	0	-	-	-
3.1%	6,227	ESE	6,174	53	2	-	-	-	-
7.2%	14,601	SE	14,599	2	-	-	-	-	-
7.3%	14,901	SSE	14,898	3	-	-	-	-	-
5.7%	11,618	S	11,608	10	1	-	-	-	-
4.5%	9,114	SSW	9,113	1	-	-	-	-	-
3.6%	7,294	SW	7,294	-	-	-	-	-	-
3.8%	7,662	WSW	7,661	1	-	-	-	-	-
7.1%	14,454	W	14,450	3	-	-	-	-	-
12.3%	25,052	WNW	24,827	225	29	0	-	-	-
16.4%	33,286	NW	30,610	2,676	187	1	-	-	-
8.5%	17,309	NNW	15,980	1,329	108	1	-	-	-
1.8%	3,731	Null	0	-	-	-	-	-	-
100.0%	203,196		192,424	7,040	522	17	-	-	-
			94.7%	3.5%	0.3%	0.0%	0.0%	0.0%	0.0%

Figure 31 – Directional Wind Speed Summaries from SCE weather data sites



In Figure 31, on the previous page, the offshore winds are highlighted in light red, and the onshore winds in light yellow. These are the winds that are most likely to occur during a wildland fire. All nonhighlighted areas are less than 6% of the data set for that direction.

From the data derived from the six sites, assumptions about the model inputs for the fire behavior modeling can be created. For this report, the minimum fuel moisture for 1-hr fuels will be 3% based on the RH values shown in Figure 30 as found at the referenced sites.

Wind assumptions, based on the values in Figure 31, will be modeled from the S, SSW, and WSW at 40 mph combined with N, NNE, and NE at 70 mph as the “worst-case” scenarios.

### Intensity

The intensity of a wildfire is measured in the energy release expected from the flaming front of the fire (active burning). Intensity is greatly affected by topography, weather, and the amount of fuel available to burn. For example, a brush fire in heavy chaparral in a steep canyon can produce a greater wildfire intensity than short grass fuels on flat ground. Wildfire intensity is measured in units of heat transfer per length of the fire edge within the fire modeling community but is more often expressed in terms of flame length for easier understanding in training and discussion with those who fire fight fires and those who must live with the potential of wildland fires.

Fire intensity is the primary wildfire characteristic related to potential fire effects. Typically, the greater the intensity the greater the loss, but this is not always the case. (USDA Forest Service Gen. Tech. Rep. RMRS-GTR-315. 2013, page 5)

The factors affecting wildfire intensity include the elements of the fire behavior triangle (fuel, weather, and topography) as well as spread direction (heading, flanking, backing, etc.). At a basic level, wildfire intensity can be assessed for a point, stand, or landscape without consideration of fire spread by assuming that a fire occurs at the given location(s) under specific weather, fuel moisture, and fire spread parameters (heading, flanking, or backing). Typically, this is assessed as the near-maximum potential (for example, heading fire under 97th percentile fuel moisture and wind conditions).

There may be a very low probability of a wildfire occurring under these conditions in any particular area, but nevertheless, this level of assessment provides useful information about the potential wildfire behavior that different areas of a landscape are capable of producing. At the landscape scale, this type of wildfire hazard assessment may also be used to identify where on a landscape there is the potential to meet or exceed specific wildfire behavior thresholds, thus aiding the identification and prioritization of management opportunities. (USDA Forest Service Gen. Tech. Rep. RMRS-GTR-315. 2013, pages 7-8)

In order to assess potential intensity, it is necessary to examine the fuels, topography, and configuration in order to accurately assess both the hazard and the risk to the adjacent areas. The topography includes elevation, slope, aspect, and features, such as canyons, valleys, or rivers.

### *Fuels* (wildland and built)

Wildland fuels on and near the Project Site consist mainly of grass and shrubs. Figure 32, below and Figure 33, on the next page, provide illustrations of the fuels on and near the Project Site. Below, the fuels are classified by number in categories as listed in the legend. In each category, the amount of fuel is generally greater as the number increases. Grass fuel 101 has less combustible fuel available than grass fuel 102. The 100's are grasses, the 120's are grass/shrub mixtures, the 140's are shrub fuels, the 160's are understory fuels, and the 180's are tree litter fuels. These all apply to surface fuels (within 6' of the ground), as canopy fuels are dealt with separately in other modeling modules. The Project Site (shown here with the Partial Creek Avoidance alternative overlaid) is mostly grass and grass/shrub fuels with some areas of shrub-only fuel. Canopy fuels are not predominant. Fuels are assessed in 30-meter grids with the predominant fuel type within the grid representing the entire grid.

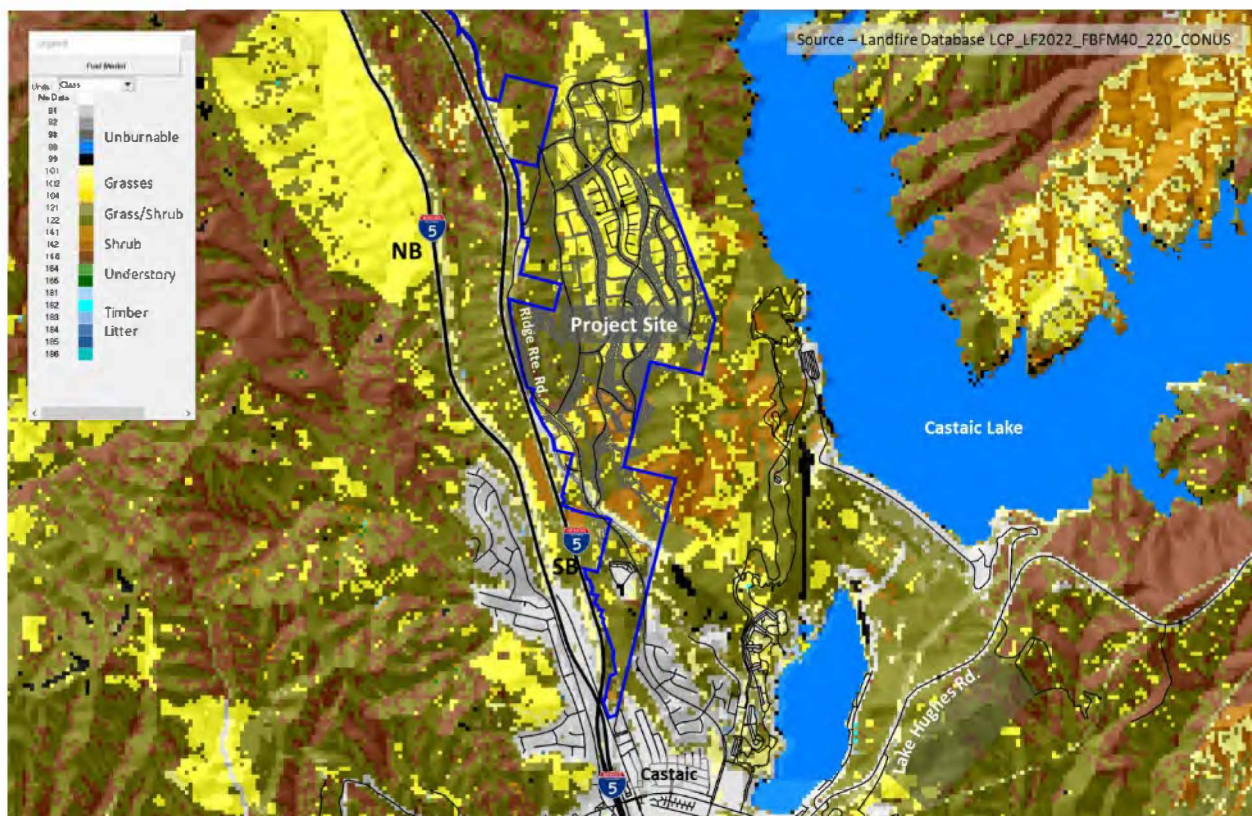


Figure 32 – Wildland Fuels Map

The site is more specifically covered with three types of wildland fuels (as shown in Figure 33, on the next page) Ruderal Grassland and Meadows, Southern California Coastal Scrub, and South California Dry-Mesic Chaparral according to the most recent downloadable Landfire database. These fuel types are also consistent with the finding of the SEIR which was provided in Figure 10 on page 16 of this report. The legend in Figure 33 has been simplified to the Project Site with arrows indicating the predominant wildland fuels.

The existing vegetation type assessment was completed prior to the Route Fire 2022 and is representative of the fuel found during the site visit, which is annotated by location in Appendix



A of this report. The fuels found in the current Landfire Database Landscape file will be used in the modeling for this report (LCP\_LF2022\_FBFM40\_220\_CONUS). Developed areas to the south and southwest of the Project Site are at a distance that does not make them a direct impact on wildfire fuel, but they do provide a fuel break from the native fuels and are important to the modeling. They are also categorized as “non-burnable” for the most part. This will be discussed later in the fire behavior section of this report.

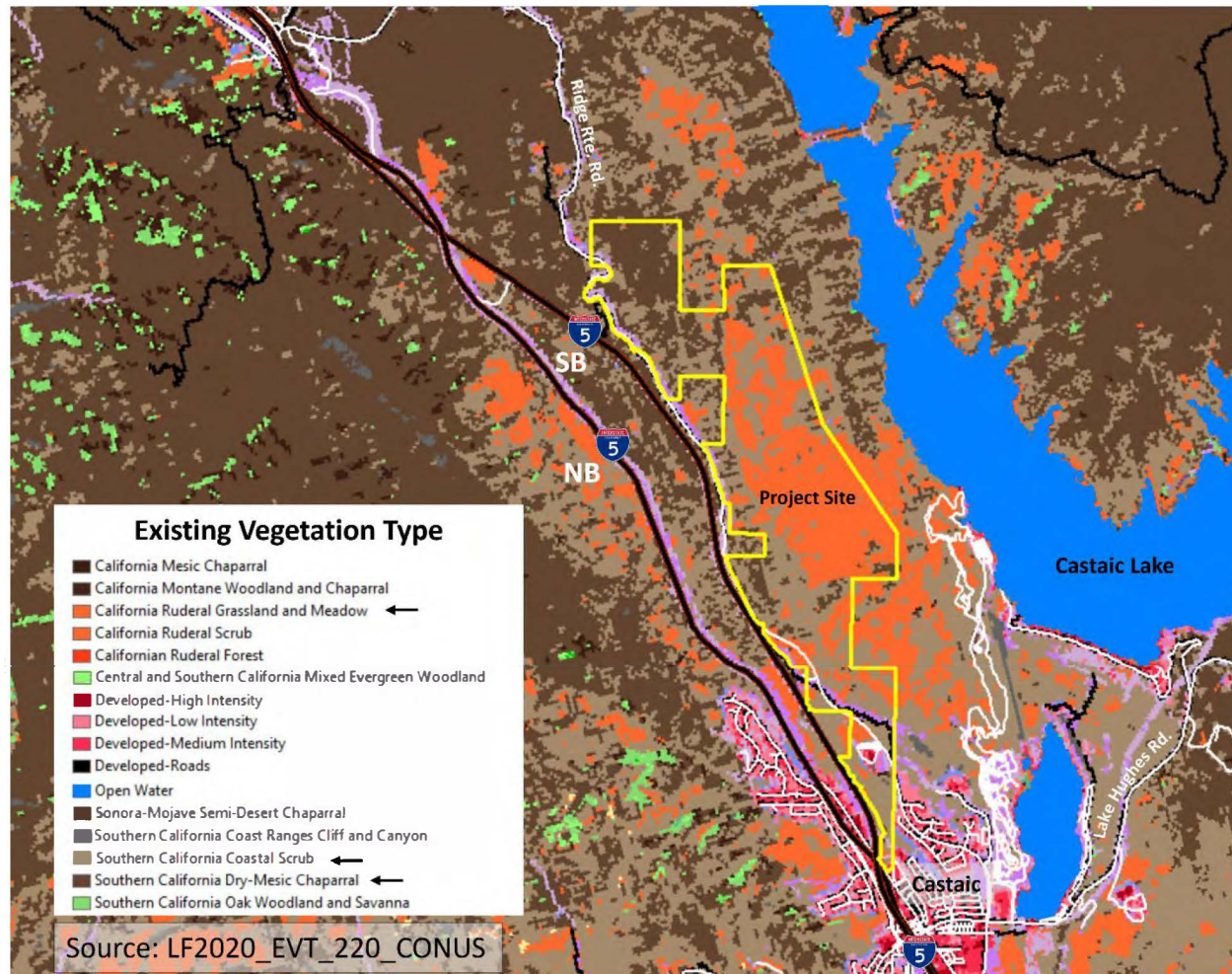


Figure 33 – Existing Vegetation Type Map

### Slope

Slope can influence how a fire will move up or down hills. A fire that ignites at the bottom of a steep slope will spread much more quickly upwards because it can pre-heat the upcoming fuels with rising hot air. The upward drafts are more likely to create spot-fire conditions. In the absence of winds, fires usually move faster uphill than downhill, so the steeper the slope, the faster a fire moves. Wind can overpower the slope factor, but generally steeper slopes result in more extreme fire behavior. If the slope is below a site, it will have a more significant impact on the site than if the slope is moving up and away from the site.

Slope can be measured in degrees or percentages. A 45-degree angle is a 100% slope because it rises one foot for each linear foot of the slope. Figure 34, on the next page, provides an



illustration of the slopes around the Project Site prior to grading. The slope percentages shown in the graphic are the average for the 30-meter grid that is displayed for that area. In the graphic one of the possible configurations is provided for reference. The slopes within the development area will be changed during the grading process and, for the most part, will be reduced in steepness or averaged over a larger area. For the purposes of this report, the portions of land in the native interfaces where the wildland fires could be burning are the “area of interest” as they will not be modified and will retain the native fuels.

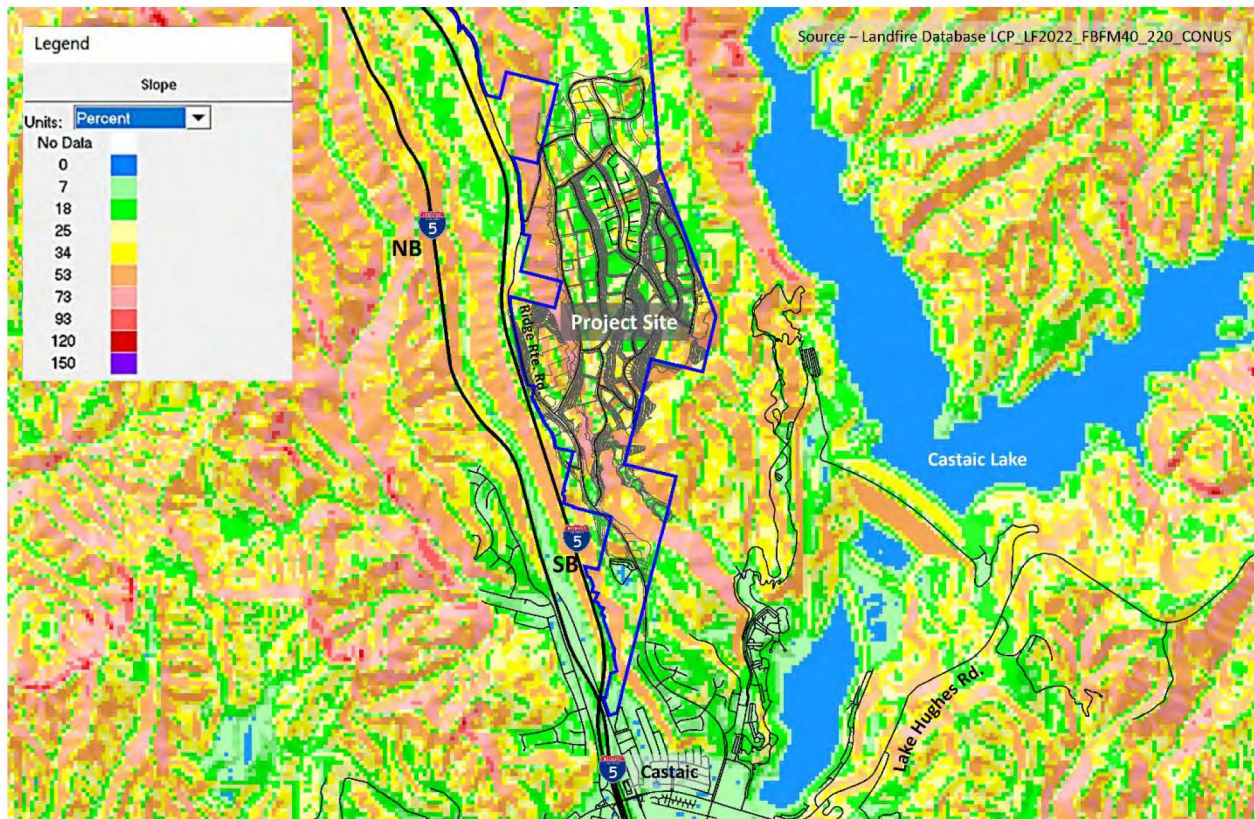


Figure 34 – Slope Map

When averaged over the 30-meter grids, there are no areas with slopes over 80 percent in the interface areas of the Project Site. The values depicted below in Figure 34, are the values that are used in the fire modeling for this report.

### *Aspect and Elevation*

Aspect is the compass direction the slope faces. Elevation and aspect can determine how hot and dry a given area will be. Aspect, in particular, often dictates the amount of direct sunlight that wildland fuels will receive in areas where slopes are steep enough to cast shadows. South aspects tend to get more sun than any other aspect, and north aspects, if the slope is significant enough, can be sheltered from the sun's heat and drying effects. This is why, under the right conditions, fuel loading on the northern aspects of some drainages tend to have more fuel. An example from the Project Site is provided in Figure 35 on the next page.

The National Wildfire Coordinating Group (NWCG) speaks to the issue of south-facing slopes in the S190 (Introduction to Wildland Fire Behavior) training materials. It states, “In the Northern



Hemisphere, the slopes facing south receive direct sun rays and become hotter than the slopes facing any other direction. The higher temperature on the southern exposures results in lower humidity, rapid loss of fuel and soil moisture, and drier, lighter, flashy fuels such as grass. All of these things add together to make southern slopes more susceptible to fires than northern slopes.” This statement about northern/southern slopes does not apply to wind-driven fires, only slope and fuel-driven fire. When winds are from the N or NE and align with the heavier fuels on the north slopes, the possibility of extreme wildland fire behavior is increased exponentially. (*S190 - Introduction to Wildland Fire Behavior, Module 2: Principles of Wildland Fire Behavior, Topic 2: Topography, Aspect, p3*, [https://training.nwcg.gov/classes/S190/508Files/071231\\_s190\\_m2\\_508.pdf](https://training.nwcg.gov/classes/S190/508Files/071231_s190_m2_508.pdf))



Figure 35

The Aspect Map (Figure 36, on the next page) provides an illustration of how the topography will interact with the Project Site. One of the possible alternatives is provided for reference. To the west, aspects are primarily E and SE, and to the East, they are primarily W aspects to the ridgeline above the Project Site, where they transition to E and SE. The north end of the Project Site is mostly S and SW aspects and to the South of the development area, it is extremely varied.

In the general areas of the Project Site, the ridgelines run N/W with faceted smaller drainages running perpendicular to the ridgeline. This configuration is visible on the Elevation Map (Figure 37, on the next page). It shows the Project Site rising up from the south with higher ridgelines to the west and east. The highest point in the Project Site is at the northern boundary in an area that will be developed. It touches the 2,400-foot contour on the USGS topographic map. The lowest point in the Project Site is at the south, where Grasshopper Creek exits the Project Site at approximately 1,250-foot elevation. The difference is considerable, but it is not enough nor is it in an elevation band that dramatically changes the types of wildland fuels available to burn. All of the adjacent wildland fuels remain “soft chaparral” which generally grows below a 2,500-foot elevation.



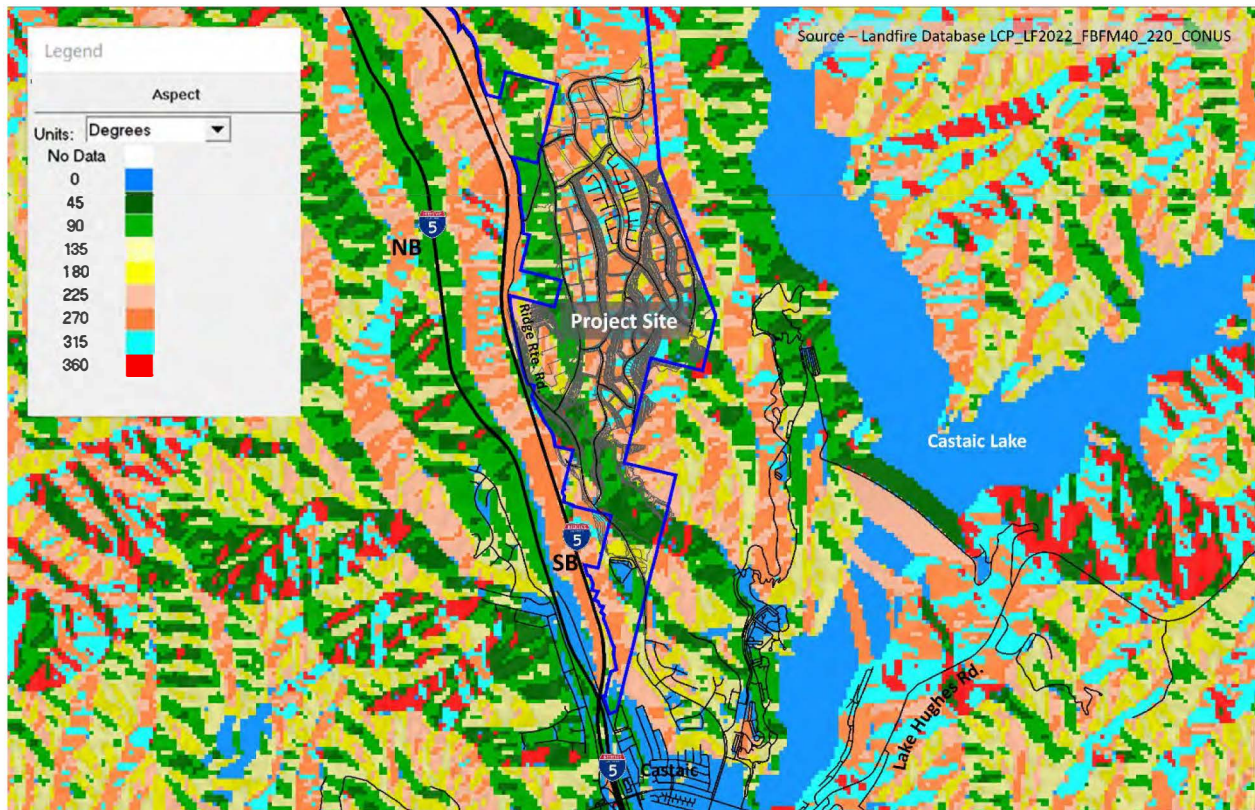


Figure 36 – Aspect Map

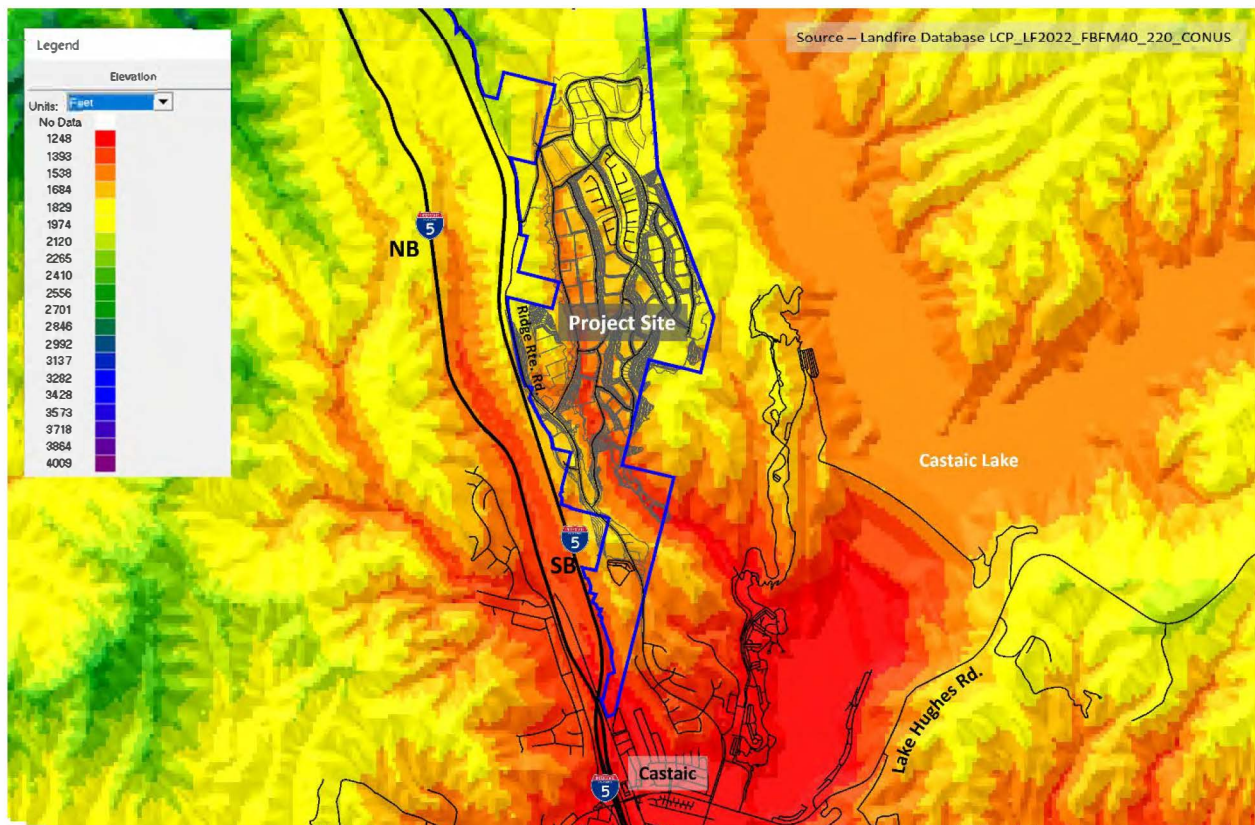


Figure 37 – Elevation Map



### *Weather*

The data from the previously discussed data sites provide the needed assumptions for the fire modeling. In addition to the what (data), it is important to understand the why. For the Project Site, the wind has the largest impact on the amount of risk that can be expected from wildland fires. The topography, fuels, and configurations of the interface between the Project Site and the remaining native vegetation are relatively stable (changes are mostly over longer timeframes) whereas weather changes rapidly and often throughout the day, week, months and seasons.

In the Project Site area, wind tends to have a large impact on the temperature, relative humidity, fuel moisture, and direction of fire travel. Winds for the Project Site are driven by two conditions, onshore flow and offshore flow, when it comes to wildland fire behavior impacts. Onshore flow is created when the land mass heats up (mountains and deserts particularly) inland, creating a low-pressure area. Cooler air from over the ocean flows onshore to fill these low-pressure areas. To some degree, this occurs every day. The inland heating causes daytime onshore winds, and when the night comes, the flow reverses once the air over the ocean is warmer than the air over the land mass. This is depicted in Figure 38 below.

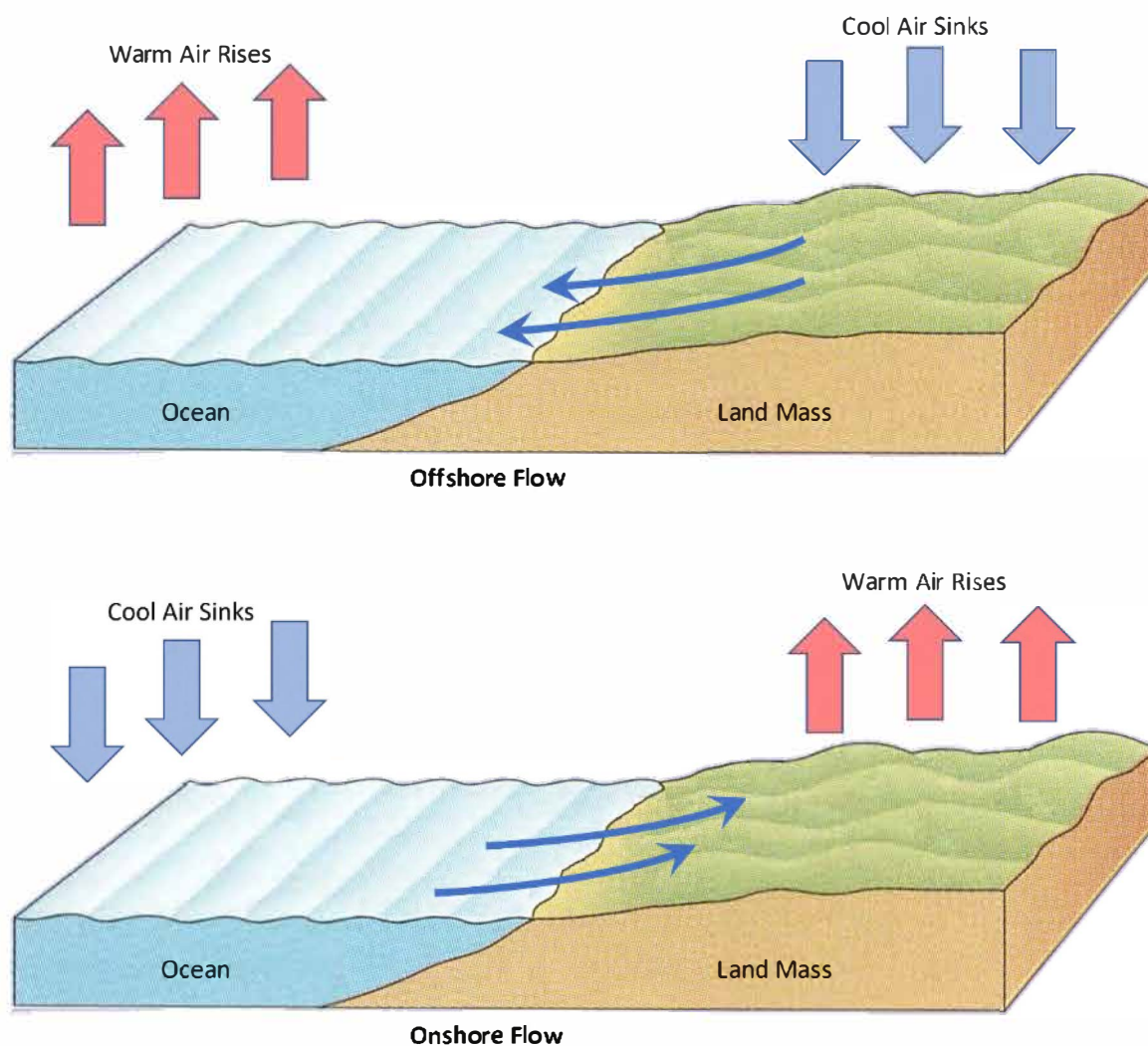


Figure 38 – Onshore vs Offshore Flow

Fronts and large high-pressure domes can override this normal flow. One such event is a high-pressure area to the east (often called a high-pressure dome) which sets up air flow from the interior moving toward low pressure over the ocean. This creates the Santa Ana wind events that occur regularly in southern California but more often in the fall. Figure 39, below, illustrates how the flow might occur (base graphic taken from an actual wind event) when the high pressure is both east and north of the Los Angeles basin. Very often, the high pressure moves from the west to the east while moving from the north to the south across the high desert area or even the “four corners” area of the United States. The wind event is driven by the pressure difference between the high- and low-pressure areas.

Santa Ana winds tend to warm as they travel across the dry areas to the east (sometimes hot areas). The moisture in the air (RH) is reduced by this arid region. The winds are channeled by the topography and in some cases, the wind speeds are significantly increased by this process. This results in high winds which are hot, dry, and sustained. At the Project Site, Santa Ana winds will normally come from the N, NNE, or NE due to the way the air flows through the mountain passes to the north and east of the project site. Most extreme fire behavior in southern California occurs during a Santa Ana wind event.

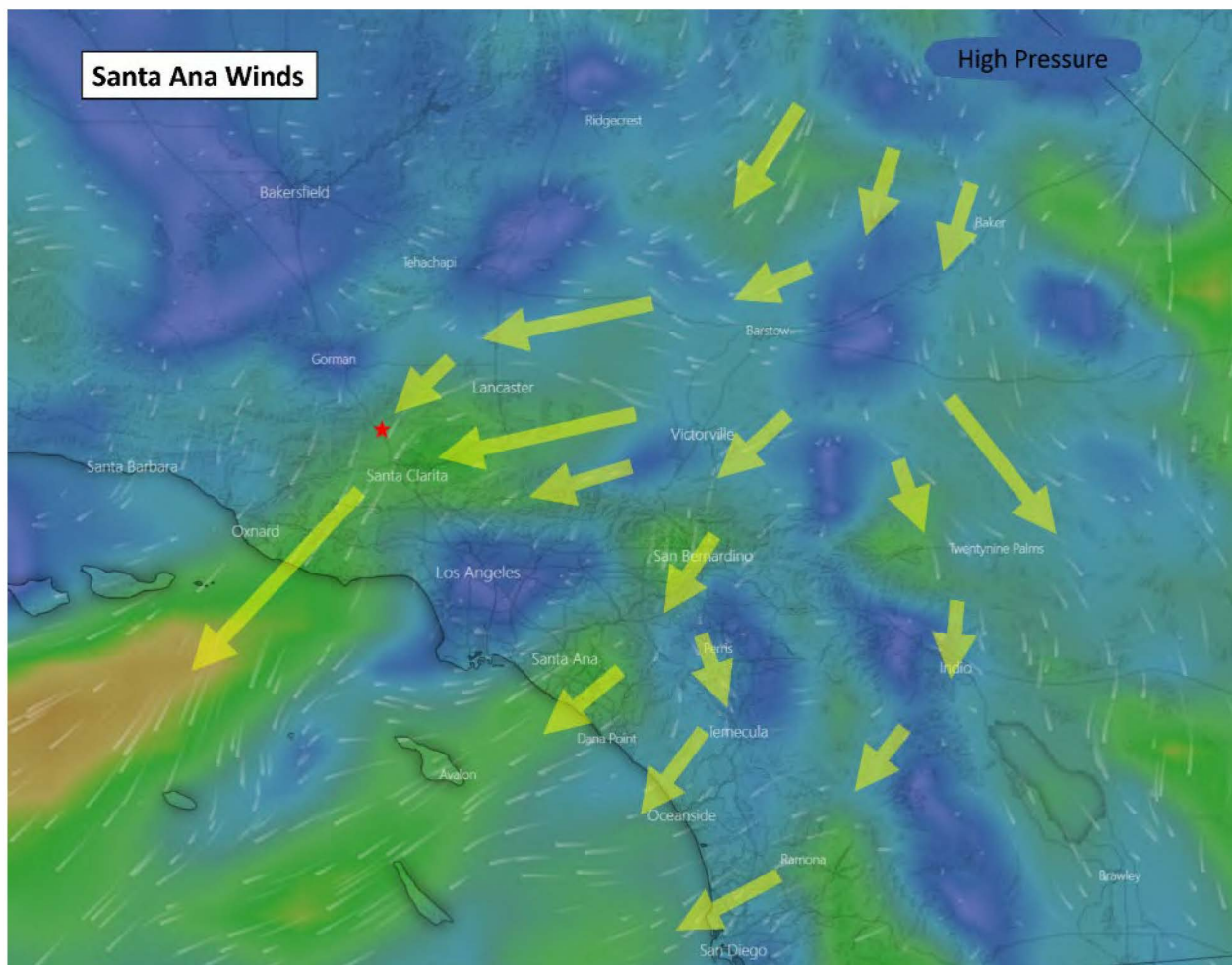


Figure 39 – Santa Ana Wind Event Map



## Historical

USGS scientists and collaborators have found that the number of wildfire ignitions and wind speeds outweigh temperature and precipitation in determining the area burned in Southern California's Santa Ana wind-driven fires.

*Using historical weather data, the researchers identified Santa Ana events from Southern California between 1948 and 2018. Then, using climate and fire records, they determined how well three types of variables explained the total area burned during these events: 1) weather associated with the Santa Ana wind event, 2) climate during the months and years prior to the event, and 3) the number of ignitions during the Santa Ana wind event.*

*The analysis found that most climate and weather-related variables were not strong or consistent drivers of area burned over the 71-year time period studied. Higher temperatures during or in the months prior to Santa Ana Wind events were generally not associated with the area burned, and precipitation was a significant factor only during some months and time periods. In contrast, wind speeds and number of ignitions were strongly and consistently associated with the area burned. (<https://www.usgs.gov/news/research-spotlight-ignitions-and-wind-speed-are-strongest-drivers-area-burned-santa-ana-wind>)*

As winds and fire starts are the primary contributors to extreme fire behavior, it is important to understand when and how often this occurs. A study completed in 2010 found that the events start in late summer and continue through early spring. Each event lasts a few days but can exceed five days in some cases.

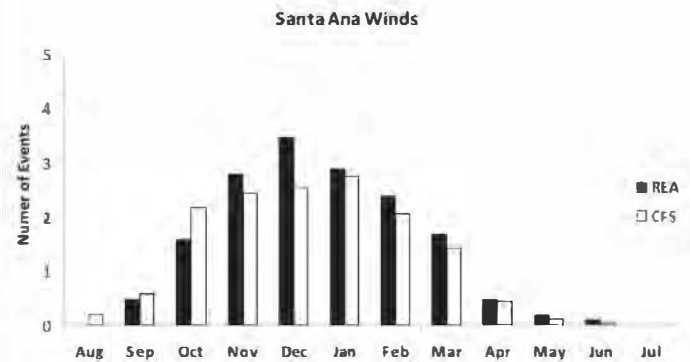
*Santa Ana winds (SAW) are synoptically driven mesoscale winds observed in Southern California, usually during late fall and winter. Because of the complex topography of the region, SAW episodes can sometimes be extremely intense and pose significant environmental hazards, especially during wildfire incidents. A simple set of criteria was used to identify synoptic-scale conditions associated with SAW events in the NCEP–Department of Energy (DOE) reanalysis. SAW events start in late summer and early fall, peak in December–January, and decrease by early spring. The typical duration of SAW conditions is 1–3 days, although extreme cases can last more than 5 days. SAW events exhibit large interannual variations/ and possible mechanisms responsible for trends and low-frequency variations need further study. A climate run of the NCEP Climate Forecast System (CFS) model showed good agreement and generally small differences with the observed climatological characteristics of SAW conditions. (Jones, Charles & Fujioka, Francis & Carvalho, Leila. (2010). Forecast Skill of Synoptic Conditions Associated with Santa Ana Winds in Southern California. Monthly Weather Review. 138. 4528-4541. 10.1175/2010mwr3406.1.)*

The combination of low moisture content (air and fuels) combined with wind events and ignitions during the wind event provides the necessary conditions for extreme fire behavior and a large wildland fire to occur in the area of the Project Site. Data from the 2010 study is summarized in Figure 40 on the next page.

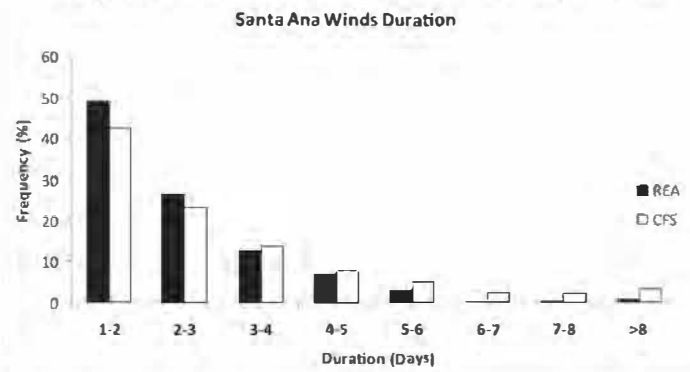
The climatological properties of the synoptic-scale conditions associated with Santa Ana Winds (SAW) were assessed. This was accomplished using the National Centers for Environmental Prediction-Department of Energy (NCEP-DOE) reanalysis and a climate run of the NCEP Climate Forecast System (CFS) model.

The dark bars refer to NCEP-DOE reanalysis, and the clear bars refer to the CFS climate run.

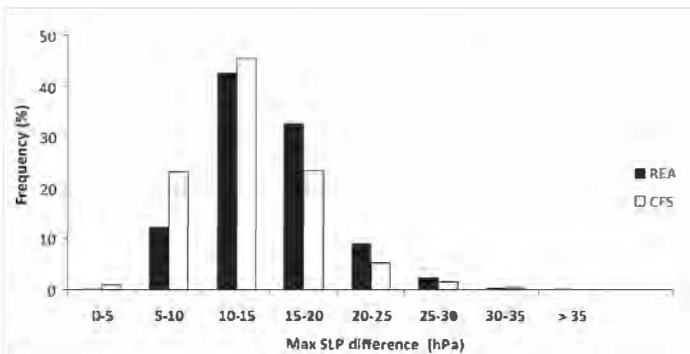
Mean number of Santa Ana wind events per month. (top)



Frequency distribution of duration of events. (middle)



Frequency distribution of maximum sea level pressure difference between the Great Basin (35°-45° N, 120°-107.5° W) and Southern California (30°-35° N, 120°-115° W) domains. (bottom)



Jones, Charles & Fujioka, Francis & Carvalho, Leila, (2010). Forecast Skill of Synoptic Conditions Associated with Santa Ana Winds in Southern California. Monthly Weather Review. 138. 4528-4541. 10.1175/2010mwr3406.1

Figure 40 – Santa Ana Wind Event Date Profile

Santa Ana wind events, in and of themselves, do not produce extreme fire behavior conditions. In fact, in the USGS study highlighted on the previous page, the following conclusion was found:

*The data highlights the fact that regardless of extreme winds and weather conditions, wildfires cannot occur without an ignition. Of the 643 Santa Ana wind events examined in the study, more than 75% had no fires, and even during extreme winds there was a greater than 50% chance of no burning.*  
<https://www.usgs.gov/news/research-spotlight-ignitions-and-wind-speed-are-strongest-drivers-area-burned-santa-ana-wind>

### *Expected Fire Activity Based on History*

Based on the location of the Project Site adjacent to the I-5 freeway (source of many fire ignitions) and the proximity of the historic fire corridor to the north, coupled with the probability



of wind events in the area during times of low moisture (fuel and air), it must be assumed that extreme fire behavior is going to occur near the Project Site in the near future and continue. Of the 26 large fires to occur in the area around the Project Site (Figure 17, on page 24), all occurred between April and December. Sixteen of the 26 (62%) occurred in June, July, or August, with 8 (31%) occurring in August (Figure 41, below).

These conditions are the reason for this report modeling extreme fire behavior that has not been recorded by the weather data stations or specifically documented in the fires which have occurred in the surrounding area to the Project Site. Mitigation for extreme fire behavior will be necessary.

Month	Occurrences	%	
April	1	4%	
May	3	12%	
<b>June</b>	<b>5</b>	<b>19%</b>	<b>19%</b>
<b>July</b>	<b>3</b>	<b>12%</b>	<b>12%</b>
<b>August</b>	<b>8</b>	<b>31%</b>	<b>31%</b>
September	3	12%	
October	2	8%	
November	0	0%	
December	1	4%	
18 years (2004-2022)	26	100%	62%

Figure 41 – Regional Fire History Occurrence Chart

### Wildfire Risk

The assessment of Wildfire Risk is to examine the hazards in terms of the vulnerability of the assets at risk, the amount of exposure those assets have and the susceptibility of the assets to wildfire.

#### Vulnerability

Vulnerability must be examined at multiple levels (Regional, Landscape, Community, and Parcel). At the end of the day, it all comes down to time, distance and shielding. The amount of time that the fire will impact the area, the distance between the fire and the structures/residents, and the ability of the Project Site to shield its structures/residents from the harmful effects of the fire.

In terms of regional vulnerability, state-wide studies such as the Caltrans Climate Change Vulnerability Assessment Statewide Summary Report 2021 provide a good overview of how different regions of the state of California are expected to be impacted by various climate change issues.

CalTrans completed a statewide Caltrans Climate Change Vulnerability Assessment for the entire State Highway System in 2019. This study involved applying climate data to refine the agency's understanding of potential climate impacts to the State Highway System, and Caltrans coordinated with various state and federal agencies and academic institutions to obtain the best available climate

data for California. Discussions with professionals from various engineering disciplines helped identify how changing climate hazards may affect highways, including their design. The assessment allowed Caltrans to begin to understand how climate change may affect the highway and identified a subset of State Highway System assets on which to focus future efforts. (<https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/office-of-smart-mobility-and-climate-change/caltrans-climate-change-vulnerability-assessment-statewide-summary-feb2021-a11y.pdf>)

Table 1 (Figure 42 in this report) summarizes the lengths of the State Highway System that passes through the medium to very-high wildfire exposure areas. The Project Site is located in District 7 which is expected to see only a 4.3% increase in the number of State Highway System miles that pass through the medium to very high wildfire exposure areas.

**Table 1: Centerline Miles of Highway Exposed by Year**

District	Year			
	2025	2055	2085	
1	585	702	784	34.0%
2	1519	1534	1544	1.6%
3	743	743	743	0.0%
4	377	546	631	67.4%
5	761	837	875	15.0%
6	638	630	638	0.0%
7	442	451	461	4.3%
8	483	556	655	35.6%
9	296	333	349	17.9%
10	781	786	786	0.6%
11	371	378	423	14.0%
12	71	72	72	1.4%
<b>Total</b>	<b>7068</b>	<b>7567</b>	<b>7961</b>	<b>12.6%</b>



CALTRANS CLIMATE CHANGE VULNERABILITY ASSESSMENT STATEWIDE SUMMARY REPORT 2021

Figure 42 – CalTrans Climate Change Vulnerability Assessment Wildfire 2021

At the Parcel level, the issue of vulnerability is more specific to the actual structure, the amount of defensible space and the degree of “hardening” of the structure. The current building code standards for structures in the Fire Hazard Severity Zones create the ability for the structure to be more survivable during a fire in the interface. This issue has been studied, and the findings support this view.

The CalFire DSpace (Defensible Space) and DINS (Damage Inspection) Program Analysis program completed an assessment to analyze the effectiveness of Chapter 7A building codes, where they performed a spatial analysis that compared the location of damaged/destroyed commercial and residential structures for the seven largest fires that occurred in 2017 and 2018 (Atlas, Camp, Carr, Nuns, Thomas, Tubbs, and Woolsey) to a 2018 statewide parcel layer. Parcel



data, maintained by counties primarily for location and tax purposes, is the most authoritative dataset for information regarding the value and year built of structures in each area.

This research demonstrates the power of geospatial information to inform research-based decisions. The study demonstrated that structures built to pre-Chapter 7A building codes were more likely to be destroyed in the seven largest fires on record between 2017 and 2018 (Atlas, Camp, Carr, Nuns, Thomas, Tubbs, and Woolsey). The results also demonstrate that residential structures built in High and Very High Fire Hazard Severity Zones (FHSZ) were less likely to be destroyed by wildfire than those built in Low FHSZ and Urban classifications.

Using over 1,000 pre-fire home inspections, we were able to use real-world data to analyze what factors were most strongly associated with residential structure loss in the Camp Fire. Our findings indicate that wooden roofs, single-pane windows, wooden decks/patios, combustible exterior siding, and a combustible fence attached to a structure are the attributes that are most likely to increase the odds of loss for a residential structure. Structures with double pane windows and patio/carport covers, decks, and exterior siding made of non-combustible materials had a significantly lower chance of structure loss. (CAL FIRE Defensible Space and Damage Inspection Program Data Analysis, August 27, 2019, Steven R. Hawks, William L. Brewer)

Between the Regional level and Parcel level are the Landscape and Community levels. The Landscape level is about the vegetation surrounding the development. The U.S. Fire Administration defines this level as:

*Wildland landscapes are the dense natural areas that surround the community. These large natural areas can be made up of thousands or even millions of acres. They contain diverse natural fuel types, have undergone various levels of development or management, and are under the oversight of state, federal, tribes, cities or other agencies and organizations.*

*These landscapes require the highest level of collaborative management and partnership. Local fire resources can actively work with the larger land management partners in establishing forest management discussions, project prioritization, strategic planning and implementation efforts.* (U.S. Fire Administration, *Wildfire, Healthy Landscapes*, <https://www.usfa.fema.gov/wui/healthy-landscapes/>)

At the Community level are the issues of placement on the topography, fuel modification zones, roadside clearance, allowable plant palette, and infrastructure (roads, water, design).

Vulnerability is further divided into Exposure and Susceptibility for the purpose of analysis in the case of wildland fires.

### *Exposure*

Exposure is the result of Likelihood and Intensity combining or occurring simultaneously. A community or structure can be directly exposed to wildfire from adjacent wildland vegetation (direct flame contact, radiated heat exposure, or convected heat exposure), or indirectly exposed to wildfire from embers and home-to-home ignition.

The Project Site will have structures that are constructed in accordance with the current codes with respect to wildland fire safety. This means that they will be “hardened”, they will have defensible space designed into the configuration, they will be protected with automatic fire sprinklers, and the entire Project Site will have fuel modification zones in accordance with the development requirement of the Los Angeles County Fire Department (up to 200’ distance in some cases). Direct exposure to a wildland fire is extremely unlikely, given the requirements applied to this development. Indirect (embers and brands) are likely to occur during a fire in the adjacent wildland. Requirements in the Los Angeles County Building Code Chapter 7A and in the Los Angeles County Residential Code Section R337 provide for ember protection through requirements on vents, gutters, roof valleys, decks, exterior siding, eave protection and several other areas where fire embers might be an issue if they were to land or collect.

The issue of home-to-home ignition is addressed by several mitigations which include: the automatic fire sprinkler systems which are designed to hold the fire to the room of origin, the increased fire resistance nature of the exterior of the structures, the use of double-pane windows with one pane being required to be tempered glass and requirement of Chapter 49 of the Fire Code, and the Public Resources Code Section 4291 which provides for the requirements of the “home ignition zone” to reduce the possibility of structure ignition or fire movement between structures.

The CalFire DSpace (Defensible Space) and DINS (Damage Inspection) Program Analysis program concluded that “... *a higher proportion of parcels built pre-Chapter 7A contained a destroyed structure and a greater proportion of parcels with no damaged or destroyed contained a structure built post 2009*”. It also concluded that, “... *results also demonstrate that residential structures built in High and Very High Fire Hazard Severity Zones (FHSZ) were less likely to be destroyed by wildfire than those built in Low FHSZ and Urban classifications*” which provides some data on the improved outcomes in the zones where construction features are required to be increased for direct and indirect wildland fire impacts.

### *Susceptibility*

The NorthLake project’s three configurations are more alike than they are different. Figure 43, on the next page, overlays the three configurations in order to show the similarities and differences. There are two significant differences from a wildland fire perspective.

The Previously Approved configuration and the Creek Avoidance configuration have significantly larger wildland interface perimeters (36.8% and 43.4% respectively) compared to the that of the Partial Creek Avoidance configuration. This means that there are more interfaces with direct impact on the development. Perimeter structures must be protected from radiant heat, direct flame contact and convected heat to a higher degree than the structures which are in the interior of the development envelope. This increased area equates to increased risk potential.

The second difference is the configuration of the development. The Previously Approved and Creek Avoidance configurations have areas at the north end of the Project Site, which have pockets of development with wildland fuels on multiple sides with short distances between them in the development envelope. While not an Intermix condition (as described on page 21), the convoluted interface will increase the complexity of the fire behavior closer to the development area. Additionally, the Creek Avoidance configuration has vegetation on both sides of the



project access roadways (all three), whereas the Previously Approved and Partial Avoidance configurations have this condition on only one of the project access roads. This will be discussed further in the evacuation analysis later in this report.

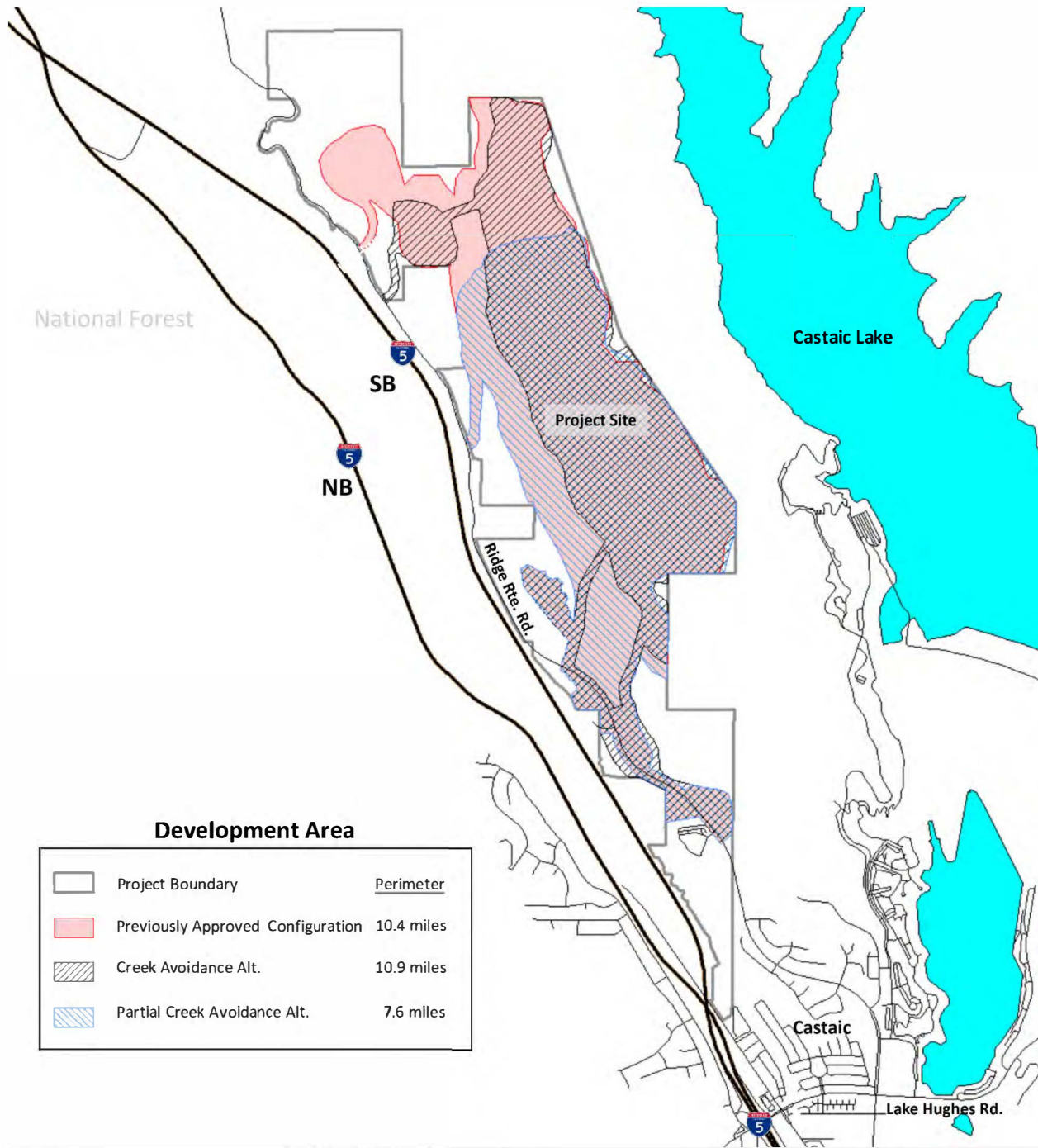


Figure 43 – Project Configurations Overlay

### Climatic Conditions

*Increasing Temperatures:* While temperature increases are likely, according to most of the published materials on climate change in California, the Project Site is not likely to be impacted by this change in terms of wildland fire behavior. The USGS report cited earlier stated, “*Higher temperatures during or in the months prior to Santa Ana Wind events were generally not associated with area burned.*” Higher temperatures may well increase the curing rate (rate at which the seasonal growth loses moisture and becomes a dead fuel) of seasonal grasses and increase the decline in fuel moisture during the dry periods, but the wildland fuels which are adjacent to and within the Project Site are drought tolerant. Where they not, they would have already succumbed to the current drought cycles in the region. The temperature is certainly important on an incident-level analysis, but this assessment is considering the worst-case scenario and has already assumed that this has occurred.

(<https://www.usgs.gov/news/research-spotlight-ignitions-and-wind-speed-are-strongest-drivers-area-burned-santa-ana-wind>).

*Shifting Wind Patterns:* The Santa Ana winds will continue to shape wildfire activity across Southern California. While Fire Weather and Fire Behavior Modelers continue working to determine how these wind events will be impacted by climate change, this analysis has already taken the worst-case wind into account from the current data available.

*Precipitation:* The amount of rainfall and when it occurs have an extreme impact on fire conditions every year. Drought-impacted fuels are also more susceptible to wildfire. Wildland fuels in this analysis have assumed an extremely low level of moisture in both the dead and live fuels to account for this aspect of climate change. Changing patterns of rainfall will impact plant growth, thereby altering the amount of fuel for fires.

*Changes in Wildland Fuels:* After a fire, the lack of precipitation will have an effect on the vegetation that returns. Invasive plants may overtake the native species after a fire. *Most evidence indicates that the strongest impacts of invasive plants on fire regimes in California occur in coastal sage scrub, deserts, and riparian areas.* During this interval, fires may have faster rates of spread but will have lower fireline intensity.

When one thinks of fire in California, one immediately thinks of the massive conflagrations that occur in central and southern California chaparral and sage-scrub ecosystems, particularly because of their close proximity to dense population centers. These closed-canopy shrublands—particularly intact chaparral—are in fact relatively resistant to invasion by non-native species. However, non-native plants are increasingly closely tied to fire dynamics and to ecosystem responses to fire in some regions.

Under natural conditions, chaparral communities retain most fuels in the canopy layer and have relatively long fire intervals (greater than 20 years). Contrary to common perception, foliar tissue does not easily ignite except under super-heated conditions or when leaf tissue moisture is low. However, several weedy forbs and grasses tend to thrive at the disturbed edges of these shrublands along roads, power lines, and fuel breaks where shrubs are removed. The invasive, annual grasses that often colonize these areas dry out much earlier in the spring than the native shrubs, and with their high surface area to volume ratio, are more prone to ignition than the native



vegetation. Mediterranean grasses such as *Bromus* species and slender oats (*Avena barbata*) are particularly implicated since they act as wicks, spreading fast-moving fire into the canopies of larger shrub vegetation.

(Invasive Species and Fire in California Ecosystems, Adam M. Lambert, Carla M. D'Antonio, and Tom L. Dudley, 2010).

California sagebrush in the southern part of the state will adjust better to climate change than sagebrush populations in the north, according to UC Irvine researchers in the Department of Ecology & Evolutionary Biology affiliated with the Center for Environmental Biology. (<https://ceb.bio.uci.edu/research/ca-sagebrush/>)

The Project Site has both shrub and grass fuels at the perimeter/interface. The modeling will show fire activity in the shrub, grass/shrub mixtures and grass fuels. All three are accounted for in the analysis.

*Shifting Insect Habitat:* Insect infestations are rising in response to the changing climate, increasing tree mortality—particularly in the southern Sierra Nevada—and reducing carbon storage according to the Best Practices for Analyzing and Mitigating Wildfire Impacts of Development Projects Under the California Environmental Quality Act published by the California Attorney General in October of 2022. The Project Site has few trees and will have only small areas of trees at its interface with the native fuels. Insect infestations are not expected to impact the Project Site in any meaningful way.

### **Hazard and Risk Summary**

The Project Site is embedded in an area that is adjacent to native wildland fuels on most of the Project Site wildland interface. The Project Site is located, for the most part, within the Grasshopper Canyon drainage, where most fuels will be at the same level or above the new structures. According to the CalFire database, fires have historically occurred with regular frequency in the regional area around the Project Site and have burned over the Project Site on more than one occasion. Current scientific studies (cited previously in this report) indicate that large fire activity will involve winds pushing the fire to achieve extreme fire behavior. The I-5 corridor is a source of many fires within the area but also serves as a barrier to some fires (fire perimeter stops at the freeway) where fire conditions (ember cast) do not allow the fire to cross over the freeway and continue to burn. Extreme fire behavior is possible and should be modeled in any scenario in which fire behavior outputs are to be used in this report. This is the basis for the analysis that follows.

The Project Site will need to mitigate against direct fire impingement, radiant heat impingement, convected heat impacts, and ember/brand intrusion which are all required by the current Regulations. Additionally, modeling will need to demonstrate that the Project Site can be evacuated in a timely manner or that if evacuation is not possible because of the location of the incipient fire, the community will be able to provide “areas of refuge” until it is safe to evacuate, or the fire is suppressed.

## Project Impacts Related to Wildland Fires

### Ingress/Egress

All three of the project configurations have the same two southerly access points with respect to the point at which they intersect with Ridge Route Road. The third access point (most northerly) is different for each configuration. The Previously Approved configuration has the third access point at the most northerly intersection of the three whereas the Partial Creek Avoidance configuration has the third point access at the most southerly intersection of the three. For discussion purposes, the Evac (evacuation) points have been labeled in Figure 44. Evac Point 3A is for the Previously Approved configuration, 3B is for the Creek Avoidance configuration, and 3C is for the Partial Creek Avoidance configuration.

The Creek Avoidance configuration differs from the other two in that a large area of native vegetation exists between the first and second access points that do not exist in the other two configurations. Each Evac point will be discussed for each fire scenario.

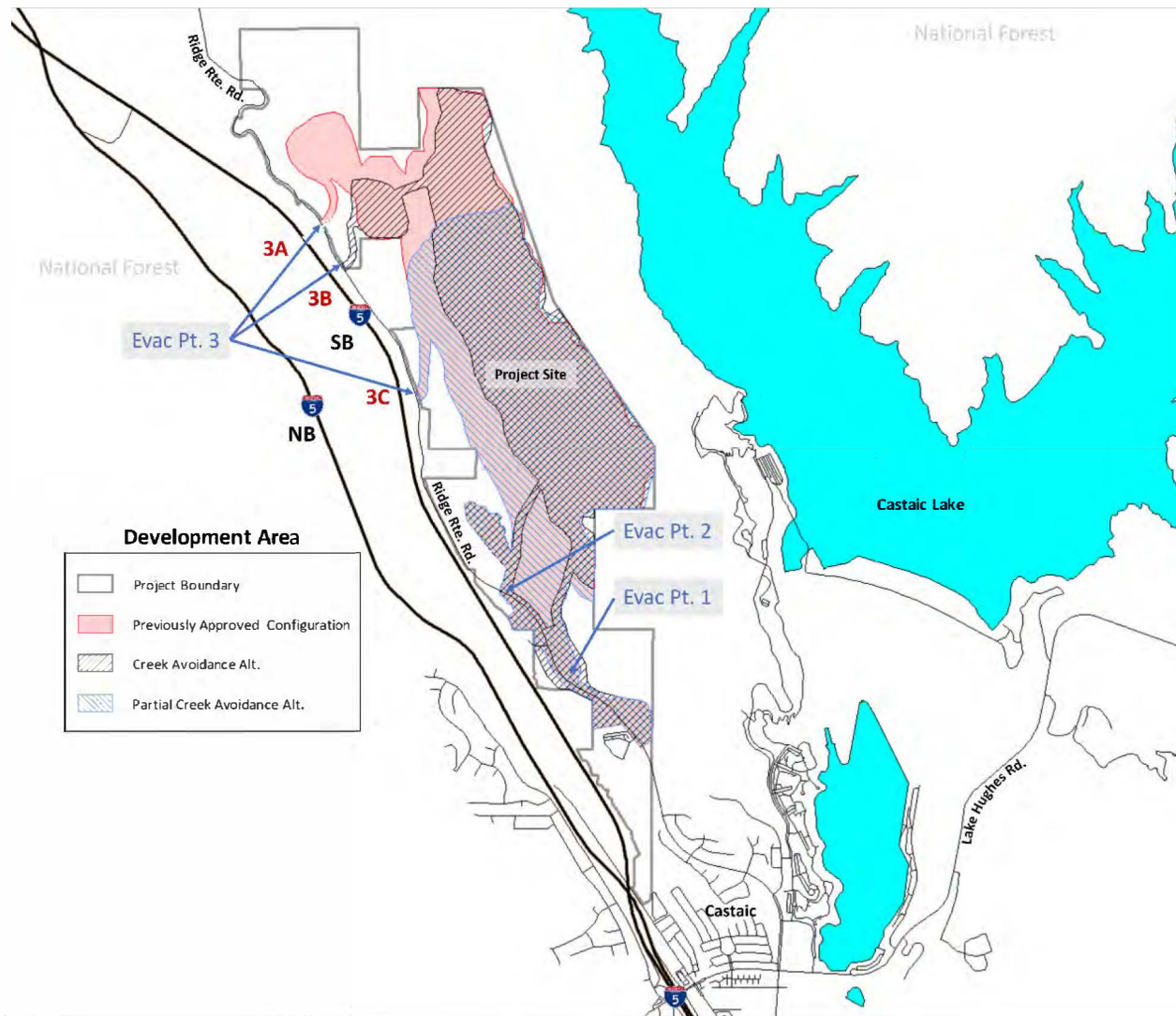


Figure 44 – Evac (Evacuation) Points



## Fire Modeling

Fire modeling will provide a number of outputs that can be used to examine the need and appropriateness of project design features and mitigation measures. Static modeling is for a given location or condition which does not account for variables over the landscape. The BehavePlus modeling software will be used for this purpose. *“The BehavePlus, Fire Behavior Prediction, and Fuel Modeling System is the most popular and accurate method for predicting wildland fire behavior in pre-fire defense planning. The BehavePlus fire behavior computer modeling system is utilized by wildland fire experts nationwide. Because the model was designed to predict the spread of a fire, the fire model describes the fire behavior only within the flaming front. The primary driving force in the fire behavior calculations is the dead fuel less than 1/4” in diameter; these are the fine fuels that carry the fire. Fuels larger than 1/4” in diameter contribute to fire intensity, but not necessarily to fire spread. The BehavePlus fire model describes a wildfire spreading through surface fuels, which are burnable materials within 6’ of the ground and contiguous to the ground. This type of modeling demonstrates the potential of wind, or a slope-driven fire that could potentially enter the fuel modification zones from the adjacent wildland areas.”* (Andrews, Patricia L. 2014 (published online 2013). Current status and future needs of the BehavePlus Fire Modeling System. International Journal of Wildland Fire 23(1):21-33.)

The Regional modeling in this report will be accomplished using FlamMap which can simulate potential fire behavior characteristics (spread rate, flame length, fireline intensity, etc.), fire growth and spread, and conditional burn probabilities under constant environmental conditions (weather and fuel moisture). The version used in this report (Version 6.1) includes a FARSITE module (previously a separate application) which allows for outputs on wildfire growth and behavior for longer time periods under heterogeneous conditions of terrain, fuels, fuel moistures and weather.

Because environmental conditions remain constant when using FlamMap, MTT (Minimum Travel Time), Burn Probability, and TOM (Treatment Optimization Modeling), it will not simulate temporal variations in fire behavior caused by weather and diurnal fluctuations as FARSITE does. Nor will it display spatial variations caused by backing or flanking fire behavior. These limitations need to be considered when viewing FlamMap output using these models in an absolute rather than relative sense. However, these outputs are well-suited for Landscape-level comparisons of fuel treatment effectiveness because fuel is the only variable that changes. Outputs and comparisons can be used to identify combinations of hazardous fuel and topography, aiding in prioritizing fuel treatments.

The FlamMap software creates a variety of vector and raster maps of potential fire behavior characteristics (for example, spread rate, flame length, crown fire activity) and environmental conditions (dead fuel moistures, mid-flame wind speeds, and solar irradiance) over an entire landscape or for specific modeling applications these same outputs are limited to the simulation footprint (MTT and FARSITE). For practical purposes, the most important result of the FARSITE tests to date has been that **spread rates for all fuel models tended to be over-predicted** by the Rothermel spread equation (Rothermel 1972). (<https://firelab.org/project/flammap>). The overall result produces a conservative/worst-case analysis.

Static modeling (BehavePlus)

For the Static modeling, a worst-case fire scenario based on current and expected conditions was used. The modeling input assumptions are:

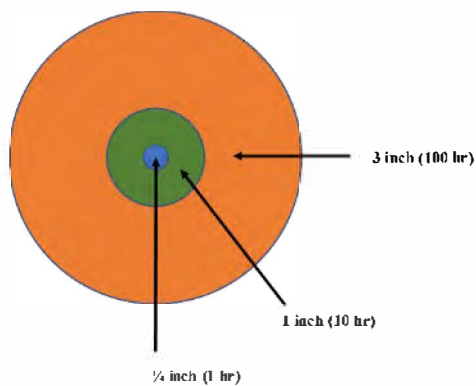


Figure 45 – Dead Fuel Moisture Sizes

1-hr Dead Fuel Moisture	3%
10-hr Dead Fuel Moisture	4%
100-hr Dead Fuel Moisture	5%
Live Herbaceous Fuel Moisture	30%
Live Woody Fuel Moisture	50%

Wind Speeds at 0, 25, 45, 65, and 80 mph with an adjustment factor of 0.5 (unprotected) were used for all to attain the midflame wind speeds. Winds are assumed to upslope in full alignment with fuels and slope. Outputs are for the head of the fire (leading edge) in the direction of maximum spread. Inputs for the modeling are shown in Figure 46, below.

**Fuel Moisture**

1-h Fuel Moisture	%	→	3
10-h Fuel Moisture	%	→	4
100-h Fuel Moisture	%	→	5
Live Herbaceous Fuel Moisture	%	→	30
Live Woody Fuel Moisture	%	→	50

**Weather**

20-ft Wind Speed	mi/h	→	0, 25, 45, 65, 80
Wind Adjustment Factor		→	0.5
Wind Direction (from north)	deg	→	45

**Terrain**

Slope Steepness	%	→	100
Site Aspect	deg	→	45

**Run Option Notes**

Maximum effective wind speed limit is imposed [SURFACE].

Fire spread is in the HEADING direction only [SURFACE].

Wind is in specified directions [SURFACE].

Wind and spread directions are degrees clockwise from north [SURFACE].

Wind direction is the direction from which the wind is blowing [SURFACE].

Figure 46 – BehavePlus Inputs for Worst-case Scenario

The outputs are provided in Appendix B (Modeling Outputs) of this report. In Figure 47, on the next page, the Flame length outputs for each of the select fuel models are provided with some additional information for perspective. The outputs are arranged in two groups, the upper section for fuel with fuelbed depths of four feet or less and the lower section for fuelbed depths of six feet or greater. Within the four-feet or less fuels, SCAL18 fuel is clearly the most impactful (largest flame length/fireline intensity) and within the six-feet or more fuels, the SH5 fuel is the most impactful, both highlighted in yellow on Figure 47. Downslope fuelbeds of six feet or



more do not exist today in the interface areas where the development will meet the native fuels. These areas are, for the most part, Sage and Buckwheat fuels or grasses. SCAL 18 is the Sage and Buckwheat Southern California-specific fuel model (Fuel models designed to be used with the BehavePlus software).

The SCAL18 fuels have the potential to produce a 55-foot flame length (54.9') under 80 mph winds running up slope, in full alignment with the wind, slope (100%), fuels, and aspect. Under the same conditions, the SH5 fuel will produce a flame length of 63 feet (63.3') and the SH7 fuel as a flame length of 59 (59.4'). With "no wind" (zero mph) the flame length for SCAL18 is 23.7 with the 100% or 1:1 slope. In Figure 48, on the next page as well, the matrix shows the interplay between slope and wind for the SCAL18 fuel.

At zero wind/zero slope, the flame length is only 5.2' (green highlight). Increasing the slope to 100% increases the flame length to 23.7', but adding a 25-mph wind to the flat slope has a greater effect moving the flame length to 31.2' (red highlight). For all slope conditions with winds 25 mph or greater, the increase in flame length is only 4-7 feet, whereas at zero wind, the slope increases by 18.5 feet when the slope is increased to 100%. Wind overpowers slope in its ability to increase flame length. Also, of note in Figure 47, several of the fuels (highlighted in blue) simply run out of available fuels and no more increases in flame length well before reaching 65 mph. At this point, an increase in slope or wind has no effect on fire behavior.

**Dry Climate Fuels - NorthLake**  
Head Fire  
Surface Fire Flame Length (ft)

Fuel Model	20-ft Wind Speed mi/h				
	0	25	45	65	80
gr1	2.6	2.6	2.6	2.6	2.6
gr2	7.6	11.6	11.6	11.6	11.6
gs1	6.4	11.1	11.7	11.7	11.7
gs2	9.3	16.1	21.9	23.4	23.4
sh1	5.3	9.1	9.8	9.8	9.8
sh2	8.5	13.8	18.3	22.3	25.1
tu5	12.9	19.5	24.2	28.3	31.0
SCAL14	17.6	27.3	32.4	36.6	39.3
SCAL15	13.1	21.3	26.2	30.3	33.0
SCAL17	11.9	20.4	27.2	33.3	35.4
SCAL18	23.7	37.9	45.2	51.1	54.9
sh5	22.3	37.9	48.3	57.2	63.3
sh7	21.8	36.0	45.6	53.8	59.4
SCAL16	17.5	28.6	35.5	41.2	45.1

Fuelbed Depth of 4' or less  
6' Plus

All available fuel is consumed,  
wind no longer has an impact

Fuel model with highest impact

Figure 47 – BehavePlus Output for Flame Length (all fuels)

\* Appendix B, Page B-41 provides fuel model descriptions

The expected fire behavior at the Project Site's native wildland interface is highlighted in purple in Figure 48. Figure 34 (Slope Map) did not have any areas greater than 93% slope within the Project Site or adjacent to the perimeter. All manufactured slopes within the Project Site will be 50% or less in slope steepness. The line highlighted in yellow provided the maximum expected

values and the area in green the minimum expected values (no slope/no wind). It should be noted that at 25 mph, flame length is 31.2 feet, this 600% increase in flame length with only 25 mph of wind provides insight to the effects of wind over slope on the fire behavior.

The Project Site will use the maximum values (yellow highlight) when implementing the project features and mitigations provided to make the Project Site safe.

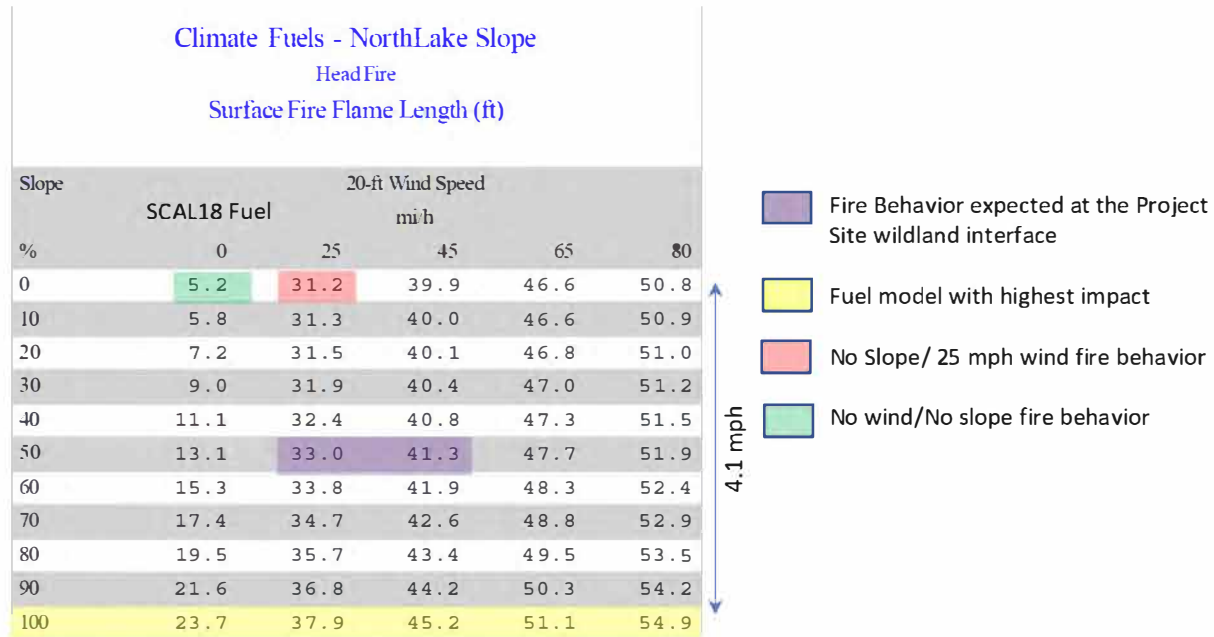


Figure 48 - BehavePlus Output for SCAL18 Fuels Flame Length

The fuel parameters (the variables for each of the fuel models) for each of the dry climate fuels near the Project Site are provided below in Figure 49. These standardized fuel models account for the amount of fuel available for combustion (Fuel Load), the size of the fuel in relationship to the area (SAV ratio or Surface Area to Volume ratio), the fuel bed depth, the level of moisture at which the fuel will no longer combust (moisture of extinction), the amount of live fuel that can be transferred to combustible fuel (Transfer rate), the amount of energy that the particular fuel model can be expected to release (Heat Content) and the amount of dead vs live fuel (live fuel must have the moisture driven off before it can combust).

For reference, Model 4 and Model 6 fuels have been included for reference. It should be noted that Model 4 fuel has a total fuel load of over 16 tons/acre. This level of fuel loading is not found near the Project Site in areas that are impactful to the Project Site, nor are they likely to occur, given the interface slope, aspect, and current vegetation. These older fuel models are not as precise as the newer (Scott and Burgan 40) models and the Southern California specific models are the most applicable (these have been used in this report for shrub fuels).



Fuel model parameters										Dead Component Calculation									
Fuel Model	Fuel Model		Fuelload (t/ac)				Fuel model type <sup>a</sup>	SAV ratio (1/ft) <sup>b</sup>			Fuel bed depth (ft)	Dead fuel extinction moisture (percent)	Heat content BTU/lb <sup>c</sup>	Fuel Model	100% Transfer			Percentage	
Code	Number	Climate	1-hr	10-hr	100-hr	Live herb	Live woody	Dead	Live herb	Live woody				Code	Dead	Herb	Dead load	Total Loaded Component	
GR1	101	Dry	0.10	0.80	0.80	0.38	0.04	dynamic	2200	2000	9999	0.4	15	8000	GR1	0.18	0.30	0.19	0.40 48%
GR2	102	Dry	0.10	0.00	0.00	1.00	0.00	dynamic	2000	1800	9999	1.0	15	8000	GR2	0.10	1.00	1.10	1.10 100%
GS1	121	Dry	0.20	0.00	0.00	0.50	0.65	dynamic	2000	1800	1800	0.9	15	8000	GS1	0.20	0.50	0.45	1.35 33%
GS2	122	Dry	0.50	0.50	0.00	0.68	1.00	dynamic	2000	1800	1800	1.5	15	8000	GS2	1.00	1.00	1.35	2.60 52%
SH1	141	Dry	0.25	0.25	0.00	0.15	1.38	dynamic	2000	1800	1600	1.0	15	8000	SH1	0.50	0.15	0.52	1.95 27%
SH2	142	Dry	1.35	2.40	0.75	0.00	3.85	static	2000	9999	1600	1.0	15	8000	SH2	4.50	no transfer	4.50	8.35 54%
TU5	165	Dry	4.00	4.00	3.00	0.00	3.00	static	1500	9999	750	1.0	25	8000	TU5	11.00	no transfer	11.00	14.00 79%
SCAL14	N/A	N/A	3.00	4.50	3.00	1.45	5.00	static	350	1500	250	3.0	15	9211	SCAL14	8.55	no transfer	8.55	15.00 57%
SCAL15	N/A	N/A	2.00	3.00	3.00	0.50	2.00	static	640	220	640	3.0	13	10000	SCAL15	6.00	no transfer	6.00	8.50 71%
SCAL17	N/A	N/A	1.30	1.00	1.00	2.00	2.00	static	640	2200	640	4.0	20	8000	SCAL17	3.30	no transfer	3.30	7.30 45%
SCAL18	N/A	N/A	5.30	8.80	0.10	0.75	2.50	static	640	1500	640	3.0	25	9208	SCAL18	6.40	no transfer	6.40	9.65 66%
SH5	145	Dry	3.60	2.10	0.00	0.00	2.90	static	750	9999	1600	8.0	15	8000	SH5	5.70	no transfer	5.70	8.60 66%
SH7	147	Dry	3.50	5.30	2.20	0.00	3.40	static	750	9999	1600	8.0	15	8000	SH7	11.00	no transfer	11.00	14.40 76%
SCAL16	N/A	N/A	2.25	4.80	1.80	3.00	2.85	static	500	1500	500	8.0	15	8000	SCAL16	8.85	no transfer	8.85	14.70 60%
Reference Only																			
Model 4	4	N/A	5.01	4.01	2.00	0.00	5.01	static	2000	1500	1500	6.0	20	8000	Model 4	11.02	no transfer	11.02	16.03 69%
Model 6	6	N/A	1.50	2.50	2.00	0.00	0.00	static	1750	1500	1500	2.5	25	8000	Model 6	6.00	no transfer	6.00	6.80 100%

<sup>a</sup> Fuel model type does not apply to fuel models without live herbaceous load.

<sup>b</sup> The value 9999 was assigned in cases where there is no load in a particular fuel class or category.

<sup>c</sup> The same heat content value was applied to both live and dead fuel categories.

Note: Dynamic fuels calculated at 100% herbaceous live fuel load transfer due to extreme low fuel moisture in the worst case scenario.

Reference: Scott, Joe H.; Burgan, Robert E. 2005. *Standard fire behavior models: a comprehensive user's guide with Fuels and surface fire spread model*. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p18.

Figure 49 – Wildland Fuel Model Parameters (a larger version is provided in Appendix B, page B-35)

Yellow highlights show the most impactful fuels under four feet (SCAL18) and over four feet (SH5). The red highlighted is to distinguish the six-foot fuel beds. The green highlight is the predominant fuel on the Project Site.

Also of note is the Rate of Spread for each of the fuels under different wind speeds, as shown below in Figure 50. SCAL18, historic fuel configuration according to Landfire data (not current condition due to Route Fire), has a rate of spread that is similar to or less than the GS2 and SH5 fuels (highlighted in red) found in the Landscape data file which is used for the fire modeling. The Landscape fuels will overestimate the rate of spread over that SCAL18 fuels (highlighted in green) which are likely to return to the Project Site.

Dry Climate Fuels - NorthLake  
Head Fire  
Surface Fire Rate of Spread (ft/min)

Fuel Model	20-ft Wind Speed					Fuelbed Depth of 4' or less
	mi/h					
	0	25	45	65	80	
gr1	30.0	30.0	30.0	30.0	30.0	
gr2	108.9	268.7	268.7	268.7	268.7	
gs1	54.0	181.3	203.3	203.3	203.3	
gs2	75.1	249.7	486.6	565.2	565.2	
sh1	31.7	102.1	120.2	120.2	120.2	
sh2	23.9	69.6	127.4	196.4	254.2	
tu5	29.1	71.6	113.8	159.5	195.5	
SCAL14	45.4	117.9	170.9	222.3	260.1	
SCAL15	52.8	151.3	236.8	325.0	392.3	
SCAL17	84.7	273.9	511.7	795.3	907.0	
SCAL18	81.2	225.6	329.8	430.4	504.3	
sh5	150.6	477.4	807.9	1168.3	1453.3	
sh7	106.0	316.5	526.9	755.4	935.6	
SCAL16	78.8	231.0	367.3	509.2	618.3	
						6' Plus

Figure 50 – BehavePlus Output for Rate of Spread (all fuels)

Static modeling has shown that flame lengths of 55 feet could be expected if the fire was running upslope, in alignment with the wind, in a continuous fuelbed, with a wind of 80 mph (Figure 48). Flame lengths of 63 feet are possible if those fuels were to grow to be six-foot-high chaparral based on the SH5 fuel model (Figure 47). BehavePlus 6.0.0 has a chaparral module for refining these calculations. If this module is run in the same scenario parameters and the maximum value

for fuelbed depth is input at 10 feet, and the Dead Load Fraction is set to the maximum value in the model of 64%, the maximum flame length is 51.5 feet, as shown below in Figure 51.

Based on the worst-case modeling calculations, a maximum flame length of approximately 50 feet could be expected under extreme conditions which are not present on the Project Site currently or in the recent past (prior to the Route Fire).

#### Inputs: SURFACE

Description		Dry Climate Fuels - NorthLake Chaparral
<b>Fuel/Vegetation, Surface/Understory</b>		
Chaparral Fuel Type		Chamise, MixedBrush
Chaparral Fuel Bed Depth	ft	10
Chaparral Dead Load Fraction	%	64
<b>Fuel Moisture</b>		
1-h Fuel Moisture	%	3
10-h Fuel Moisture	%	4
100-h Fuel Moisture	%	5
Live Herbaceous Fuel Moisture	%	30
Live Woody Fuel Moisture	%	50
<b>Weather</b>		
20-ft Wind Speed	mi/h	0, 25, 45, 65, 80
Wind Adjustment Factor		0.5
Wind Direction (from north)	deg	45
<b>Terrain</b>		
Slope Steepness	%	100
Site Aspect	deg	45

#### Dry Climate Fuels - NorthLake Chaparral

Head Fire		
Surface Fire Flame Length (ft)		
20-ft Wind Speed mi/h	Chaparral Fuel Type	
	Chamise	MixedBrush
0	11.7	23.3
25	20.3	38.3
45	20.8	44.1
65	20.8	48.6
80	20.8	51.5

Figure 51 – BehavePlus Inputs and Outputs for Chaparral Fuels Comparison

#### Regional Modeling (FlamMap/MTT)

Using the FlamMap software it is possible to track the expected path of the fire across the landscape (wildland) and provide rough timeframes for the arrival of the fire front. Specifically, the Minimum Travel Time (MTT) module provides both the path of the fire (major and minor paths) and the expected arrival interval from the starting point of the scenario. In this section, this function will be used to estimate the amount of time that would be available for evacuation at each of the Evacuation Points discussed earlier. Each scenario will be completed for all three project configurations (Previously Approved Project, Creek Avoidance Alternative, Partial Creek



Avoidance Alternative). The information generated here will be used in the traffic analysis for evacuation timeframes.

The inputs to the FlamMap software are as follows:

- Onshore winds are set to 40 mph for all scenarios except the Route Fire scenario based on the weather history for the area. 99<sup>th</sup> percentile value was under 40 mph.
- Offshore winds are set to 70 mph for all scenarios based on the weather history for the area. Maximum recorded wind gust was 69.2 mph; 99<sup>th</sup> percentile value was 37.4 mph.
- Foliar Moisture Content is set to 100% (very few trees in the area of the Project Site).
- Crown Fire Calculation Method set to Finney (2004) as this is the method used in the FARSITE modeling software and it the most appropriate for the model as it is being used (minimum travel time).
- Winds are calculated using Generated Gridded Wind (Wind Ninja) rather than generating them in Wind Ninja and importing the results.
- Fuel Moisture settings were fixed using a 3,4,5,30,50 moisture scenario as discussed previously.
- Fuel Moisture Conditions were not used as the moisture scenario is worst-case. Since the lowest recorded moisture is being used, conditioning the fuels will not lower them.
- Maximum Simulation Time was set to 420 minutes as the evacuations would be completed prior to this point.
- Spot Probability was set to 100% to maximize the worst-case conditions.
- Spotting Delay was set to zero to maximize the worst-case conditions.
- Ignition and barrier files are scenario specific but identical for each configuration alternative.

Scenarios have been completed for the following conditions:

1. **RouteFireSim** - Route Fire 2022 (wind 25 mph at 255 degrees) attempting to model the fire that actually occurred.
2. **SSWat40Spot** - SSW wind at 40 mph (spot fires), fire from a small source which will include fire acceleration as it grows to equilibrium and becomes self-sustaining. This fire represents an onshore flow with fire running at maximum wind speed under dry conditions.
3. **SSWat40Line** - SSW wind at 40 mph (line of fire). Same fire as above from an established fire burning from the perimeter as head fire.
4. **Sat40Line** – S wind at 40 mph (line of fire), an established fire burning from the perimeter as head fire. Moving the onshore from the SSW to the south as the data indicated could happen.

5. **FreewaySpotsat40** - S wind at 40 mph (freeway spot fires), fire from a small source which will include fire acceleration as it grows to equilibrium and becomes self-sustaining. Using a worst-case location to show a series of spot fires consistent with hot object from a vehicle on the freeway.
6. **LakeSpotsat40** - S wind at 40 mph (lakeside spot fires), fire from a small source which will include fire acceleration as it grows to equilibrium and becomes self-sustaining. Fire simulated as an escaped warming fire in the drainage below the Project Site
7. **NEat70Line** - NE wind at 70 mph (line of fire), an established fire burning from the perimeter as head fire. A line of fire burning into the Project Site from the NE under Santa Ana wind conditions.
8. **NNEat70Line** - NNE wind at 70 mph (project boundary) (line of fire), an established fire burning from the perimeter as head fire. Same scenario with winds from the NNE as in an early Santa Ana condition.
9. **Nat70Line** - N wind at 70 mph (line of fire), an established fire burning from the perimeter as head fire. Fire simulates the worst-case location and wind direction as the fire runs quickly down the east side of the Project Site under extreme conditions.
10. **Templin Trigger** - N Wind at 70 mph (line of fire Templin Hwy) (line of fire), an established fire burning from the perimeter as head fire. This is an effort to show how much time would be available if the decision to evacuate was made at the time the fire reached this point of origin.

Each of these fires corresponds to historic wind data from the weather site discussed previously and summarized in Figures 27 and 31 above. Each scenario has been accomplished for each of the development configurations. Outputs are provided in the appendixes. The outcomes are summarized in the matrix on page 67. The matrix specifies the amount of time that the Evacuation Point would remain viable during the specific scenario.

In addition to the Evacuation Points, Route Points (control points) have been assigned to five locations along Ridge Route for the purpose of indicating when this access route will be impacted by fire which is not associated with driving to a specific Evacuation Point. While an entire neighborhood may be evacuated over time to eliminate possible future impact on the population, this evaluation is focused on the “population at immediate risk” and determining if they can effectively be moved to a safe location. These areas are identified in each scenario in Appendix B as dark gray polygons which are in the areas the fire reaches first based on the modeled scenarios.

As indicated in the matrix, every scenario has at least one exit that is viable for a minimum of four hours before the fire reaches it, with the exception of the Freeway Spots scenario, where only 30 minutes are provided; this limitation will be in place for 60-90 minutes for all project scenarios. It should be noted that by the time Evac Point 3B is impacted, the fire threats to Evac Points 1 and 2 are gone, as shown on page 68 (Figure 53). Fires in the wildland fuels, adjacent to the Project Site, tend to burn in “ribbons of fire” which have a flaming front and little fire behavior behind the flaming front. For this reason, once the fire has passed, so has most of the risk associated with the fire. The four-hour window is a function of the fuels, topography,



location of the road and the fire weather conditions. In the case of the Project Site, this represents a considerable time for evacuation of the those who are “at immediate risk”.

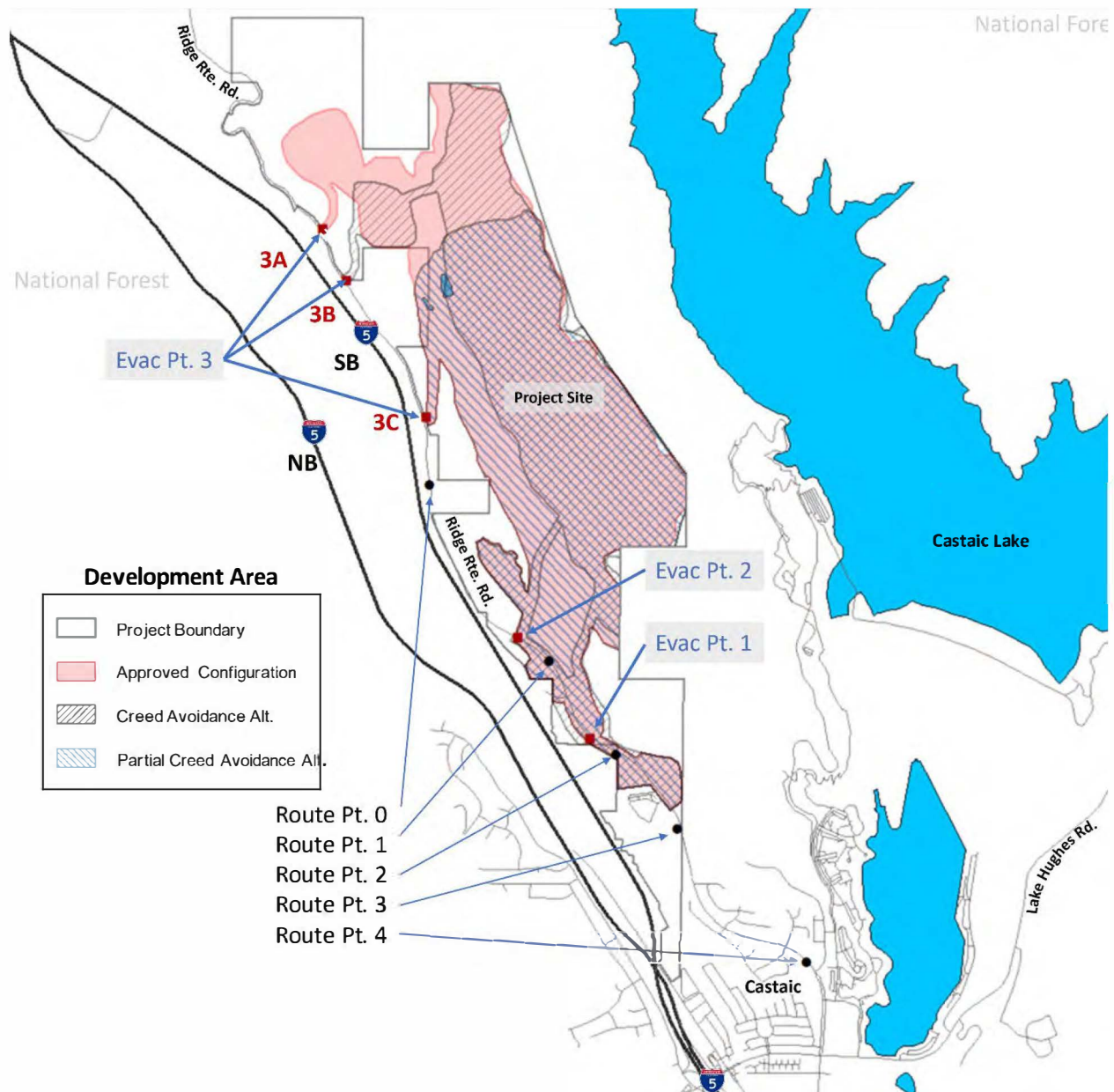


Figure 52 – Evacuation and Route Points

The assumption used here is that the Project Site will not have fire burn through (structures and landscape acting as fuel for the fire) as it will be constructed to the current building standards for wildland interface and all of the residential units will be protected by automatic fire sprinklers as required by the California Building and Fire Codes.

Evacuation from wildfires is a complicated process; assessing when to move “at risk” populations, determining if there is sufficient time to safely move them, assembling the resource necessary to institute the evacuation process (notification, routing, control, and dispersing) and

implementation of the plan once established require many inputs and a good understand of future fire behavior (expectations).

While evacuation is a law enforcement function in California, it is done with input or a request from the fire agencies involved. In fast-moving events such as the ones modeled in this report, a combination of actions is likely. Residents closest to the impacted areas should be moved first and then the evacuation area expanded based on risk to the community and/or evacuation routes. It may be necessary to use “areas of refuge” or “shelter in place” for short periods of time in areas which are less at risk or will not be impacted before the evacuation is completed. In no case should evacuations be conducted which places the population at more risk than that of staying in the location they are currently at.

As evidenced by the scenario outputs in Appendix B, the entire Project Site is never impacted at the same time. There is always some portion of the community which is not impacted or has already been impacted and is now no longer a significant risk to the occupants/evacuees. Unlike other disasters like wind events, earthquakes or even flooding, a wildland fire at the Project Site can only impact a portion of the site at any given time. Movement back into the interior of the Project Site improves the safety of those who are still in the community at the time of the fire reaching the site.

Based on the alternative available, the length of time that the evacuation routes are available and the fact that many of the closures (evacuation points and routes) are temporary in nature with areas within the Project Site where evacuees can be held without extreme risk from the fire, evacuation should not be an issue for the Project Site. The traffic engineer has run scenarios to validate the time needed to empty the “at risk” populations and the entire Project Site<sup>1</sup>. Fire will impact portions of the site before the entire site is evacuated but alternatives exist to change routes, use areas of refuge on a temporary basis or shelter population which are not currently at risk until those “at risk” have been moved to safer areas.

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<sup>1</sup> Stantec, *Northlake Specific Plan Wildland Fire Evacuation Scenarios – Evacuation Time Estimates*, May \_\_, 2023



Scenario	Evac Pt 1	Evac Pt 2	Evac Pt 3A	Evac Pt 3B	Evac Pt 3C
1. Route Fire Sim	Prev. Approved Plan – No time constraints CAA – Closes in 90 min* (reopens after 60 min) PCAA – No time constraints	Prev. Approved Plan – 60 min (reopens after 30 min) CAA – 60 min (reopens after 30 min) PCAA – 60 min (reopens after 30 min)	Prev. Approved Plan – No time constraints CAA – N/A PCAA – N/A	Prev. Approved Plan – N/A CAA – 60 min* (remains closed) PCAA – N/A	Prev. Approved Plan – N/A CAA – N/A PCAA – 60 min* (remains closed)
2. SSWat40Spot	Prev. Approved Plan – No time constraints CAA – No time constraints PCAA – No time constraints	Prev. Approved Plan – 60 min (reopens after 30 min) CAA – No time constraints PCAA – No time constraints	Prev. Approved Plan – 60 min (remains closed) CAA – N/A PCAA – N/A	Prev. Approved Plan – N/A CAA – 60 min* (remains closed) PCAA – N/A	Prev. Approved Plan – N/A CAA – N/A PCAA – 60 min* (remains closed)
3. SSWat40Line	Prev. Approved Plan – No time constraints CAA – No time constraints PCAA – No time constraints	Prev. Approved Plan – No time constraints CAA – No time constraints PCAA – No time constraints	Prev. Approved Plan – 60 min (remains closed) CAA – N/A PCAA – N/A	Prev. Approved Plan – N/A CAA – 60 min* (remains closed) PCAA – N/A	Prev. Approved Plan – N/A CAA – N/A PCAA – 60 min* (remains closed)
4. Sat40Line	Prev. Approved Plan – No time constraints CAA – No time constraints PCAA – No time constraints	Prev. Approved Plan – No time constraints CAA – No time constraints PCAA – No time constraints	Prev. Approved Plan – No time constraints CAA – N/A PCAA – N/A	Prev. Approved Plan – N/A CAA – No time constraints PCAA – N/A	Prev. Approved Plan – N/A CAA – N/A PCAA – No time constraints
5. FreewaySpotsat 40	Prev. Approved Plan – 30 min (reopens after 90 min) CAA – 30 min (reopens after 90 min) PCAA – 30 min (reopens after 90 min)	Prev. Approved Plan – 30 min (reopens after 60 min) CAA – 30 min (reopens after 60 min) PCAA – 30 min (reopens after 90 min)	Prev. Approved Plan – 30 min (reopens after 90 min) CAA – N/A PCAA – N/A	Prev. Approved Plan – N/A CAA – 30 min* (remains closed) PCAA – N/A	Prev. Approved Plan – N/A CAA – N/A PCAA – 30 min* (reopens after 90 min)
6. LakeSpotsat40	Prev. Approved Plan – 60 min* (reopens after 30 min) CAA – 60 min* (reopens after 30 min) PCAA – 60 min* (reopens after 30 min)	Prev. Approved Plan – No time constraints CAA – 90 min* (reopens after 30 min) PCAA – No time constraints	Prev. Approved Plan – No time constraints CAA – N/A PCAA – N/A	Prev. Approved Plan – N/A CAA – 120 min* (remains closed) PCAA – N/A	Prev. Approved Plan – N/A CAA – N/A PCAA – No time constraints
7. NEat70Line	Prev. Approved Plan – No time constraints CAA – No time constraints PCAA – No time constraints	Prev. Approved Plan – No time constraints CAA – No time constraints PCAA – No time constraints	Prev. Approved Plan – 0 min (closed for the first 4.75 hours of the fire) CAA – N/A PCAA – N/A	Prev. Approved Plan – N/A CAA – 0 min (closed for the first 90 min of the fire) PCAA – N/A	Prev. Approved Plan – N/A CAA – N/A PCAA – 0 min (remains closed for the entire duration of the fire)
8. NNEat70Line	Prev. Approved Plan – No time constraint for 4+ hours* (reopens after 30 min) CAA – No time constraint for 4+ hours* (reopens after 30 min) PCAA – No time constraint for 4+ hours* (reopens after 30 min)	Prev. Approved Plan – No time constraints CAA – 90 min (reopens after 30 min) PCAA – No time constraint for 4+ hours* (reopens after 30 min)	Prev. Approved Plan – 0 min* (closed for the first 4 hours of the fire) CAA – N/A PCAA – N/A	Prev. Approved Plan – N/A CAA – 0 min* (closed for the first 4 hours of the fire) PCAA – N/A	Prev. Approved Plan – N/A CAA – N/A PCAA – 0 min* (remains closed for the entire duration of the fire)
9. Nat70Line	Prev. Approved Plan – No time constraint for 4+ hours* (reopens after 30 min) CAA – No time constraint for 4+ hours* (reopens after 30 min) PCAA – No time constraint for 4+ hours* (reopens after 30 min)	Prev. Approved Plan – 60 min (reopens after 30 min) CAA – 60 min (reopens after 30 min) PCAA – 60 min (reopens after 30 min)	Prev. Approved Plan – 0 min* (remains closed for the entire duration of the fire) CAA – N/A PCAA – N/A	Prev. Approved Plan – N/A CAA – 0 min* (remains closed for the entire duration of the fire) PCAA – N/A	Prev. Approved Plan – N/A CAA – N/A PCAA – 0 min* (remains closed for the entire duration of the fire)
10. Templin Trigger	Prev. Approved Plan – No time constraint for 4+ hours* (reopens after 30 min) CAA – No time constraint for 4+ hours* (reopens after 30 min) PCAA – No time constraint for 4+ hours* (reopens after 30 min)	Prev. Approved Plan – No time constraints CAA – 60 min (reopens after 45 min) PCAA – 60 min (reopens after 45 min)	Prev. Approved Plan – 0 min (closed for the first 6 min of the fire) CAA – N/A PCAA – N/A	Prev. Approved Plan – N/A CAA – 0 min* (remains closed for the entire duration of the fire) PCAA – N/A	Prev. Approved Plan – N/A CAA – 0 min* (remains closed for the entire duration of the fire) PCAA – N/A

\* Evac Point is not Limited at this point but the travel path for ingress/egress is Limited, such as closures on Ridge Route Road.

Green highlight indicates that the exit point will be viable for four hours or more before it is Limited by the fire. Time in Parentheses ( ) is the time period for this the exit is limited.

N/A = not applicable

Source: Wildland Fire Risk Report for the NorthLake Project. 2023

Matrix 1

### Modeling Summary

In a worst-case scenario, flame lengths of 50' +/- may be possible when the fire is running upslope, in a continuous fuel bed (SCAL18 sage and buckwheat), in line with the wind, on a very dry hot day. If the fuels were to become six-foot chaparral fuel beds, the flame length could reach 63' (Sh5 fuel). This configuration is not present in the current (fuels prior to the Route Fire) interface and does not seem to have been present in the past in a review of aerial images over the past 30 years except on north facing slopes in small areas which are not below the development area(s) and not likely to produce a self-sustaining maximum fire output burning in equilibrium.

In a review of all flame lengths for all scenarios run in FlamMap, no cells within or adjacent to the Project Site had values greater than those for the worst-case scenario in BehavePlus (Figure 47). Using the Minimum Travel Time feature of FlamMap, it is possible to project the time it might take for a given fire scenario to travel the distance from the origin to each of the evacuation points within the Project Site and when they might impact the Evacuation Points. These results are provided for each scenario in the appendix and summarized in the matrix.

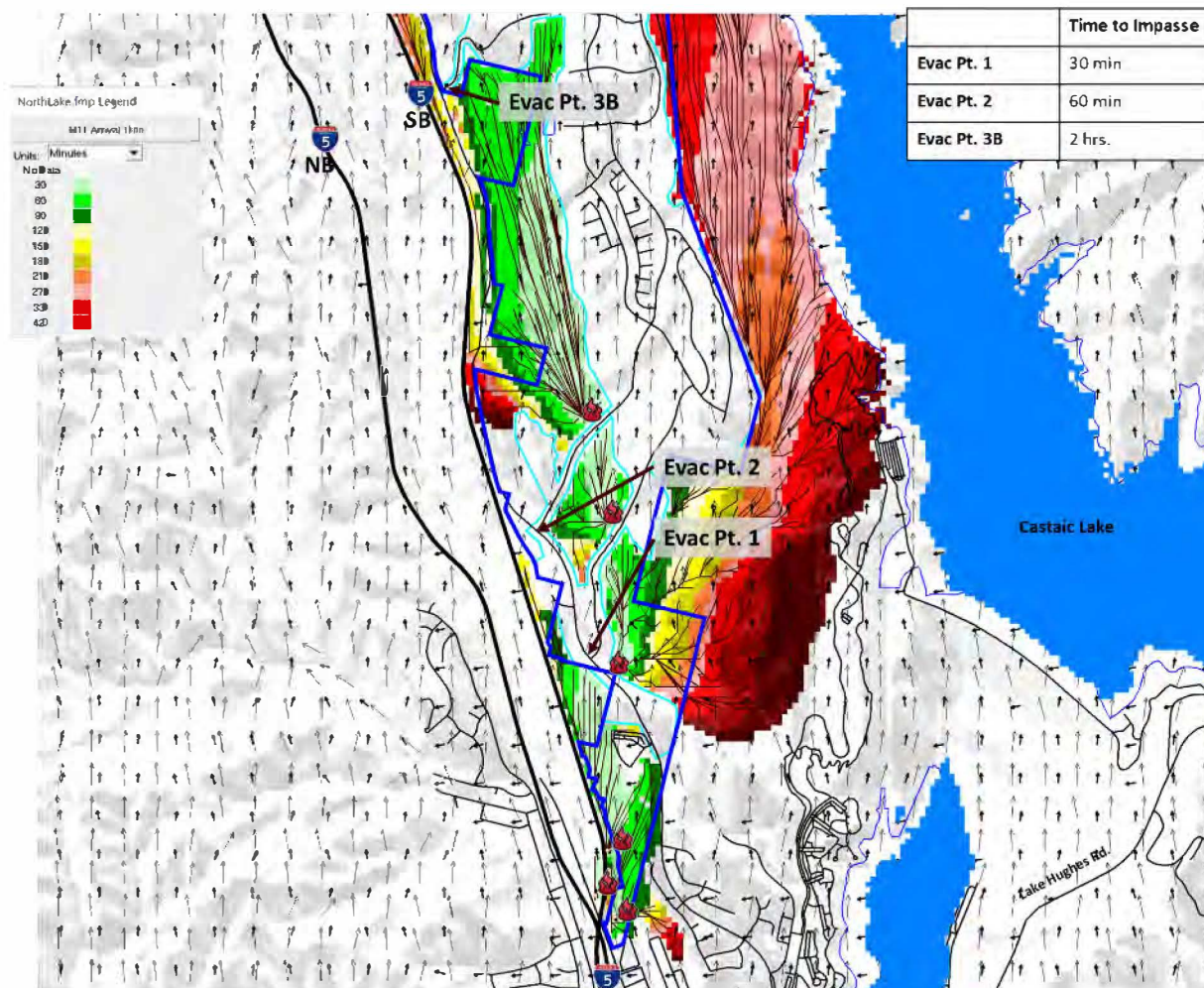


Figure 53 - Creek Avoidance Alternative/Freeway Spots Scenario Modeling Output



All project scenarios have at least one Evac Point which is viable for 4+ hours or more with the exception of the Freeway Spots scenario where only 30 minutes is available prior to a 60–90-minute closure (which would require sheltering within the community). All of the fire scenarios are run under extreme conditions. When in alignment (wind, slope, aspect and fuels), the rate of spread is extremely high and the fire travels large distance in a short period of time. In all scenarios, burn through of the community is not modeled or expected given the fuel modification zones, hardened structures and restrictions on vegetation which will be in place by the Regulation and standards required by the Los Angeles County Fire Department for new development within the Very High Fire Hazard Severity Zones.

The size, location and configuration of the Project Site makes it unlikely that a fire will impact the entire Project Site at a single time, but rather the fire will impact sections of the project interface over a period of time which will allow for resources to be redistributed and for evacuation opportunities after the fire front has passed a specific location. Travel within the Project Site should be viable at all times given the distance from the wildland fuels and the protection features which will be provided.

## Water Supply and Infrastructure

As part of the project, a total of 6 water tanks (5 new and 1 existing) with a combined capacity of approximately 13.35 million gallons (MG), would be located on a total of 3 water tank sites to serve the proposed project. In addition to the tanks mentioned above, the project will construct a water tank site for the benefit of the Newhall County Water District (NCWD). This water tank site, together with future improvements by NCWD, will improve the efficiency and reliability of the overall water system.

The Project Site will be gravity fed from the tanks with fire flow water reserved beyond the daily usage requirements. This allows for the fire flow to be available regardless of the status of electrical power. This meets the duration flow requirements by holding the required amount of fire protection water in reserve in the water tanks beyond the daily use requirements which in addition to the reserved fire flow capacity.

In accordance with the Los Angeles County Fire Code (2020):

*The minimum fire-flow for one- and two-family dwellings, and Group R-3 buildings located in a fire hazard zone shall not be less than 1,250 gallons per minute (15,141.6 L/min) for a 1-hour duration at 20 psi (138 kPa).*

*For the subdivision of undeveloped land for other than single-family dwellings, due to the undetermined building size and type of construction, the required fire flow shall be 4,000 gallons per minute (15,141.6 L/min) for a duration of four hours with public hydrant spacing of 300 feet (91.44 m). The required fire-flow for the subdivision of land consisting of lots having existing structures shall be in accordance with Table B105.1(2) for fire-flow and duration.*

All power lines within the Project Site will be underground with the exception of the transmission lines, which run across the Project Site but do not directly provide power to the Project Site. The transmission lines are much higher than the distribution lines and do not have vegetation impacts (touching) that are common to the distribution and services lines (majority of power line fires).

A review of the California Public Utilities Commission (CPUC) utility-reported fire incident data as presented by the California State Auditor in the March 24, 2022, report (Electrical System Safety, California's Oversight of the Efforts by Investor-Owned Utilities to Mitigate the Risk of Wildfires Needs Improvement) indicated that only four incidents occurred in the general area of the Project Site. These are shown in Figure 54, below. All four incidents occurred in areas which are not under the Transmission Lines which run through the Project Site.

Utility-Caused Fire Incidents Reported by the Three Largest Utilities From 2015 Through 2020



Source: CPUC's utility-reported fire incident data.

Notes: CPUC requires only the three largest utilities—PG&E, SCE, and SDG&E—to report these fire-incident data. The Camp Fire is not included in this figure. According to the CPUC's wildfire safety enforcement branch program manager, it was not included in PG&E's 2018 ignition report because the investigation of the fire was still open when the data were reported. After we brought this oversight to the CPUC's attention, the program manager stated that CPUC would work with PG&E to obtain amended data for 2018 that includes the Camp Fire.

Electrical System Safety, California's Oversight of the Efforts by Investor-Owned Utilities to Mitigate the Risk of Wildfires Needs Improvement, March 24, 2022, report # 2021-117, <https://auditor.ca.gov/reports/2021-117/index.html>

Figure 54 – CUPC Utility-reported Fire Incident Data (Report # 2021-117)



While fires are caused by electrical lines all over the state, utilities in the state of California are taking steps to increase the safety of all power lines by:

1. Undergrounding distribution lines
2. Improving safety on transmission lines through the replacement of equipment before it fails
3. Increased routine inspections
4. The use of “covered conductors” rather than “bare wire” as has been used in the past.
5. Expanded line clearance, increased hazard-tree assessments and removals, insuring adequate cleared brush at the base of poles/towers
6. Public Safety Power Shut Offs during high-risk weather events
7. Installing and monitoring of over 2,000 Remote Automated Weather Stations, expanded use of Artificial Intelligence/Machine Learning capabilities (AI/ML) for improved forecasting and the installation of High-Definition Cameras for real time monitoring of high-risk areas during extreme weather events.
8. Installation of Sectionalizing Devices and Fast Acting Fuses to decrease the risk of fire inducing events.

<https://www.sce.com/sites/default/files/custom-files/SCE%202022%20WMP%20Update.pdf>

All areas within the Project Site and transmission lines which are relocated by the Project Site will be subject to the increased safety requirements.

## **Fire Protection Resources**

### **Impacts During Construction**

Prior to combustible construction on site the LACFD requires that “all weather” fire department access roadways, fire hydrants (or approved water source alternative) and initial fuel modification zones (bare earth is acceptable at this point) are installed and approved prior to the “framing stage”. Prior to C of O (certificate of occupancy) the LACFD requires that all fire department life safety system (fire sprinklers, standpipes if applicable), fire lanes, street signs, addressing, wayfinding if appropriate, defensible space requirement and structure hardening as required by the various laws, codes, ordinance and standards enforced by the fire department and building/planning agencies be in place, tested, inspected and approve.

### **Impacts Over the Life of the Project**

Maintenance requirements for each of the safety systems or devices are assigned to specific entities (homeowners, Homeowners Associations (HOA), Local government). Repair/replacement and maintenance of these systems is established in the CCR's for the homeowners and HOA(s), while the local governmental agency is responsible for the public improvements in the Right of Way (ROW). The responsibilities and funding source for the common areas (not in the ROW) are set in the CCR's. Homeowners are responsible in the single-family communities and HOA's in the structures where community ownership of the underlying property or areas of the structure(s) exist.

Fuel Modification Zones, installed automatic fire sprinklers (except the NFPA13D system in one and two family dwellings) and defensible space are inspected by the fire department on a routine

basis (annually or bi-annually in most cases) and in the case of fire sprinklers (NFPA 13 and 13R), they are inspected and certified by third party vendors on a five year interval.

### Fire Suppression Resources

The Santa Clarita Valley is serviced by the Los Angeles County Fire Department. The regional area is well resourced with 15 current fire stations (See Figure 55, below) and two projected new fire station sites (one within the NorthLake project and FS177, one of three new fire stations to be constructed in the Newhall Ranch project).

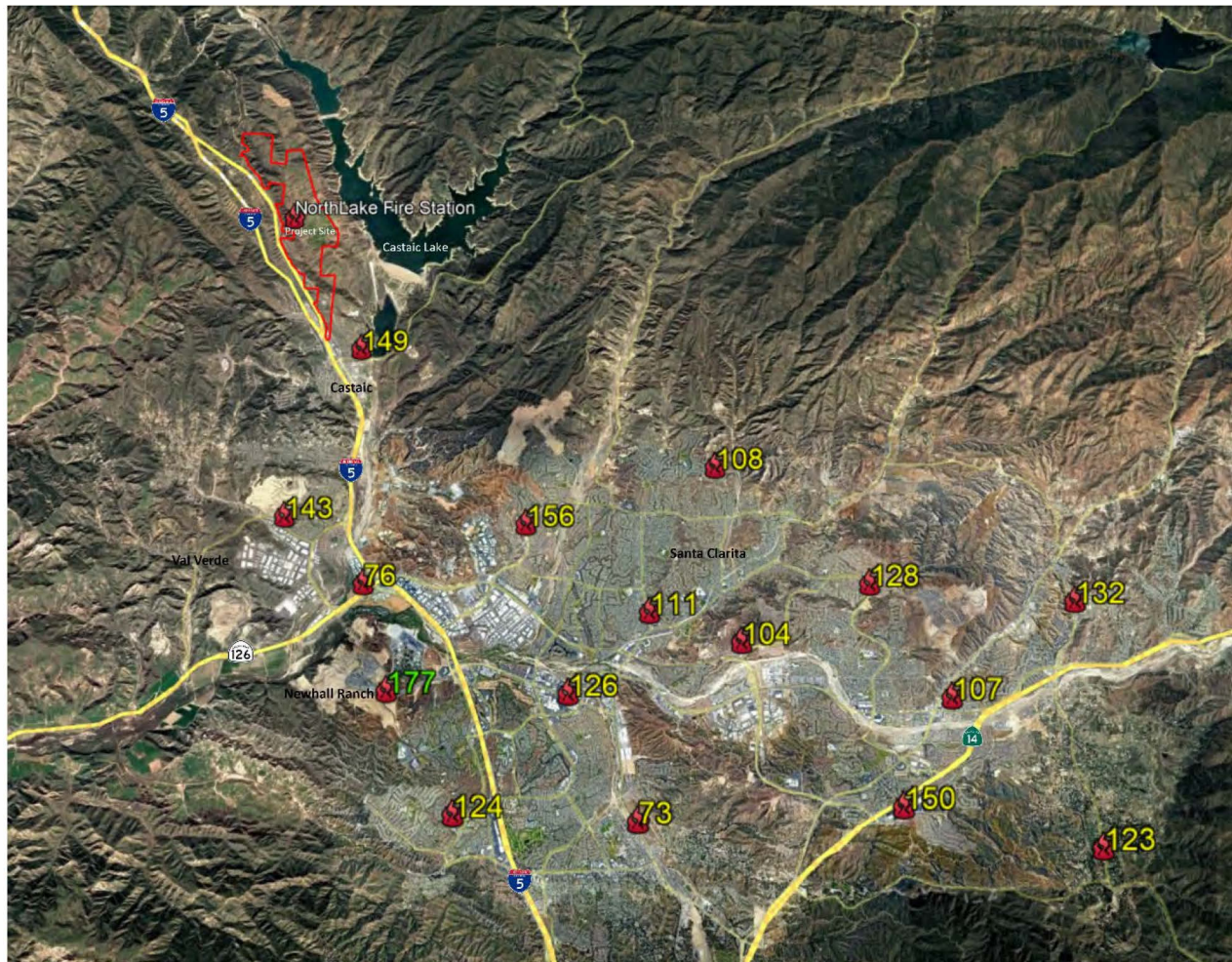


Figure 55 – Regional Fire Resources

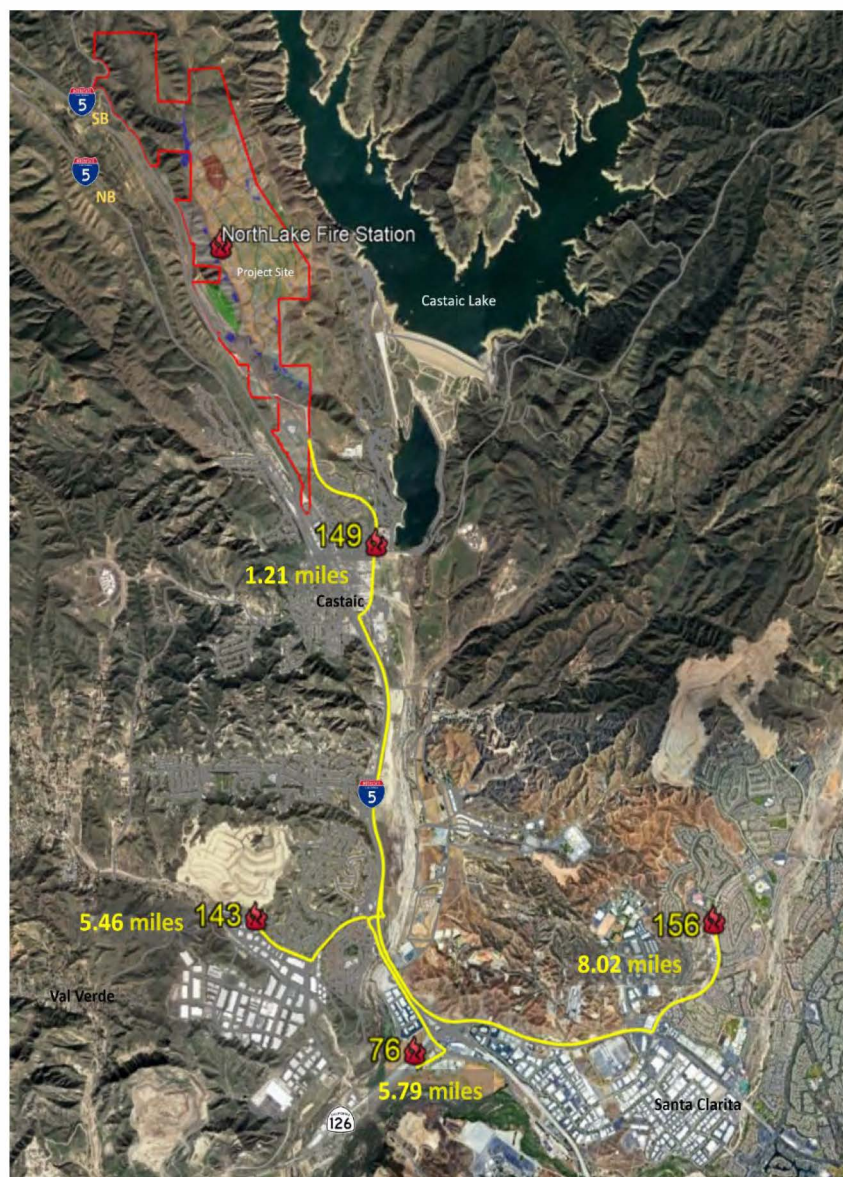
The SEIR indicates the following:

*Wildfire response resources in the Santa Clarita area include the LACFD as well as the Fire Services mutual aid system, the California Division of Forestry, and the U.S. Forest Service (USFS). The combination of forces applied depend upon the severity of the wildfire, other wildfires in progress, and the availability of resources. Suppression efforts can involve fire equipment, heavy construction equipment, and air fire bombardment aircraft in addition to hand crews. In addition to the fire stations discussed above, the LACFD operates nine fire*



*suppression camps assigned to the Air and Wildland Division. Fire suppression camps supply crews on a daily basis to assist in the suppression of wildland fires. They also perform storm-related functions, such as the filling of sandbags, and provide additional manpower at search and rescue incidents. Of the four camps located in the Santa Clarita Valley area, two are staffed with paid fire suppression aids, and the other two are staffed by a workforce comprised of adult male prisoners provided by the California Department of Corrections (CDC). This partnership with the CDC provides the Fire Department with a large labor pool. The closest fire suppression camp to the subject site is located at 35100 N. San Francisco Canyon Road in Santa Clarita. (SEIR, Section 5.5)*

The distance from the south Project Site access (Ridge Route Rd.) to the four closest existing fire stations is provided in Figure 56. The Project Site will provide a site for a new fire station within



the Project Site boundary and will contribute to the fire station construction through the conditions of approval for development in Los Angeles County. The project is required to pay the LACFD a mitigation fee in the amount in effect as of the Effective Date. This fee payment is in addition to the required conveyance of one fire station site in a location deemed mutually acceptable to the developer and the LACFD.

In addition to the 177 fire stations under the fire departments direct control, LACFD participates in several mutual-aid, auto-aid and cooperative agreements with neighboring fire department, state and federal fire agencies and has access to resources from the entire state of California under the California Master Mutual-Aid plan under California Office of Emergency Services.

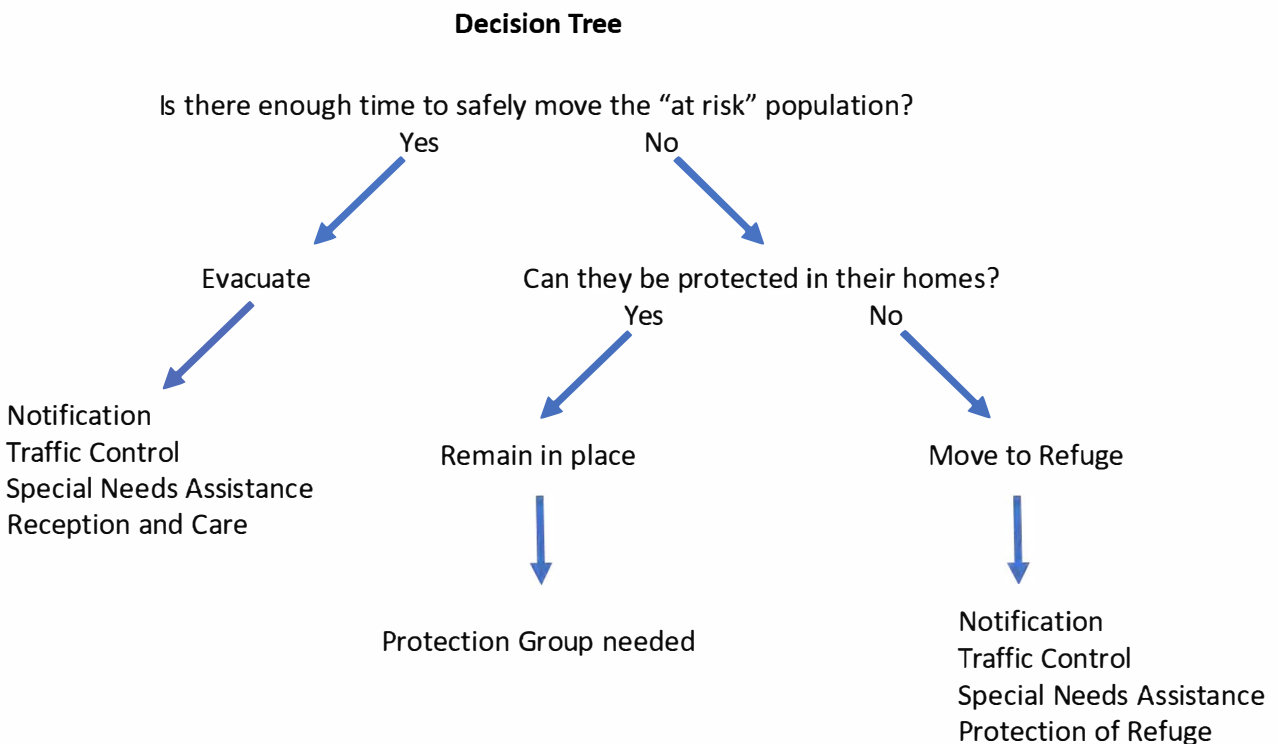
Figure 56 – Distances to closest four fire station (existing) from southern project boundary on Ridge Route Rd.



### Operational Considerations

How, when, how long will it take, and to where are all considerations that need to be considered when making tactical decisions on wildfires. Normally the majority of the effort is put towards fire suppression on the active fireline if conditions warrant it; indirect attack if not. When people are in “harm’s way”, the situation shifts dramatically. The protection of the egress pathways, the structures themselves and the area where refuge can be found, become the priority.

The decision to “Shelter in Place” is never the first choice. Getting people “out of harm’s way” is always the preferred option. Not every scenario can be anticipated, and there will be scenarios that would require the incident commander(s) or field officer of the fire and law enforcement agencies to decide on how to protect the citizens when emergent conditions arise. Below is a simple decision tree for evacuation vs. protecting people in place. Evacuation is always the preferred option but sometimes, circumstances may generate conditions where moving “at risk” population will place them in more danger. It should be noted that most evacuation scenarios are generated from large fires burning into communities. These fires would have already been burning for a period of time and would, no doubt, have been discovered. Emergency personnel would be working on the decisions below to determine where evacuation is warranted. The modeling shows that if the fire reaches certain points, evacuation is not a likely choice. If there is not enough time to safely move the population at risk to an uninvolved area, consideration of where to best protect them is the next action on the decision tree.



*Figure 57 – Evacuation Decision Tree*

In planned communities, a legal entity (normally an HOA) is responsible for common areas and the maintenance of community resources. This often includes lighting, landscape, parks, pools

and in some communities' roads, bridges, open space and when the housing products include, joint land ownership, even property insurance. Where the community has been designed and developed with wildland fire defenses such as fuel modification zones, greenbelts, roadside clearance for evacuation routes and/or special maintenance areas within the community, it is the HOA or other legal entity who is responsible for maintaining these common features. As such, there is a high probability that this ongoing maintenance will occur as required and as stated in the organizational documents which were put in place when the community was established. It also makes a single entity accountable and simplifies the inspection process as well as streamlining the communications process (notices, code and standards updates, compliance, verification of maintenance).

Evacuees do not always leave when advised to do so. Some remain to protect their homes. Others do not see the danger or do not accept the idea that they are in danger or will be. Timely evacuation prior to the fire's arrival is key to safe egress. Those who wait to evacuate will be subject to the same impacts as the fire and law enforcement personnel who stay to protect the community. If conditions degrade quickly, everyone is moved to a "safety zone" or "area of refuge" to ride the fire front out. Fire crews identify these areas as the point that they will egress to when fire conditions are too severe to continue the active fire suppression. These areas are often parks, large parking lots (empty of most vehicles), sports fields, large structures made of noncombustible materials with adequate defensible space.

The building and fire codes, and some county and state wildland fire regulations are based on requirements for the land or building owner. As such, there is not necessarily an equal level of compliance at each and every structure, even if they were constructed at the same time, under the same requirements. In wildland fire safety, when structures are not separated by a large distance (30 feet or more), the risk to one structure can be caused by the risk to the adjacent structure even when the first owner has done everything right in terms of wildland fire protection. In planned communities, this is not the case. Common areas are managed as one entity and the HOA has the power to make each homeowner comply with the regulations adopted by the local fire authority as an obligation of its fiduciary function in keeping the entire community safe. This is why planned communities are significantly different in the ability to keep the community safe from wildland fires. This is why a "systems approach" is possible.

This "systems approach" begins with the community design. Larger, planned communities generally tend to use a defined interface rather than an intermix with respect to the wildland perimeter of the development.

Cluster development (higher density with more open space) with defined perimeter protection provides for a "protective bubble" around the development. By controlling the interior (vegetation, configuration and defensible space) and providing an adequate distance (fuel modification, greenbelts, selected agriculture crops (vineyards, certain types of orchards, row crops), fuel breaks and fire breaks) the combination of these elements creates a system for the protection of the community.



The current codes and standards coupled with the design of the current fuel modification zone requirements provides for a community in which fire is unlikely to burn through the community (Burn Through) when all portions of the system are in place and functioning as designed.

### **Required Wildland Fire Protection Measures**

Wildland fire protection measures (including regulatory compliance measures) which were previously required or integrated into the Previously Approved Project and would likewise be required in the Creek Avoidance Alternative and Partial Creek Avoidance Alternative include:

- a) All dwelling units will be protected with automatic fire sprinklers.
- b) The Project Site has increasing housing density and used a consolidated design to reduce or eliminate, where possible, wildland fuels within the interior of the Project Site and keep the edge of the Project Site as an identifiable interface with appropriate fuel breaks, fire breaks and fuel modification zones.
- c) The Project Site has been designed to avoid and minimize low-density urban development patterns or leapfrog-type developments (i.e., those with undeveloped wildland between developed areas).
- d) Decreasing the extent and amount of “edge,” or interface area, where development is adjacent to undeveloped wildlands.
- e) The Project Site has/will create buffer zones and defensible space within and adjacent to the development, with particular attention to ensuring that vegetation will not touch structures or overhang roofs. The Project will establish the legal obligations within the CCR’s to ensure that defensible space measures are retained over time.
- f) Undergrounding of power lines will be accomplished in the entire Project Site with the exception of the SCE overhead transmission lines which bisect the site.
- g) The Project Site design attempts to limit development along steep slopes and amidst rugged terrain, so as to decrease exposure to rapid fire spread and increase accessibility for firefighting. Only a few sites have wildland fuels below (lower than the project structures) the Project Site and these sites will have additional protections provided with radiant heat walls, increased built-in fire protection features and/or placement of the structure so that the impacts of “underslung fuels” are mitigated.
- h) Fire hardening structures and homes in accordance with Chapter 7A of the Building Code, Section R337 of the Residential Code and the specific requirements of the fire department during the development review process for the site-specific locations.
- i) On-site water supply/storage which is gravity fed to ensure fire flow during power outages for the required duration established in the Fire Code.
- j) Siting structures and features to maximize the role of low-flammability landscape features and roadways that may buffer the development from fire spread.
- k) The Project will expand existing fire resources in the region.
- l) Placement of development within the existing or planned ingress/egress and designated evacuation routes to efficiently evacuate the project population and the existing

community population, consistent with evacuation plans, while simultaneously allowing emergency access.

Additional Measures or project design features which can be used to avoid or reduce wildfire impacts:

- a) Provide roadside clearance of 50' on both sides of all fire access roadways which transit wildland areas where the road is used for evacuation or emergency access.
- b) Work with CalTrans for emergency access gates on Ridge Route Road to facilitate a more rapid evacuation process for the Project Site without impact to the existing communities or the Lake Hughes Road interchange.
- c) Construction of "area of refuge" within the community for sheltering in the event that evacuation is not possible or practical. This would be possible at the community sports park, the school site and at some of the neighborhood parks.
- d) Requiring fire-hardened communication to the Project Site including high-speed internet service.
- e) Enhanced communication to the project population about emergency evacuation plans and evacuation zones through community education programs, electronic media avenues, physical signs on evacuation routes and fire risk status.
- f) Sponsor twice annual clean up days to rid the community of excessive vegetation, trash, debris or accumulation of tree litter/dead plant materials that have accumulated on or near the structures.
- g) Increase fire sprinkler coverage to small spaces and attic for structures protected by NFPA 13D sprinkler systems.
- h) Provide increased water reserves levels beyond those required by the Fire Code for the minimum duration of fire flow.
- i) Limit undesirable plant materials throughout the Project Site and not simply in the fuel modification and interface areas.
- j) Design structures to eliminate concealed spaces by filling them with noncombustible insulation, finishing attic spaces so that attic venting is not necessary, providing positive pressure system to over-pressurize the areas of the structure which are normally susceptible to ember intrusion and/or the use of fire resistance building materials in the areas most at risk for wildland fire penetration (roof sheeting, eaves, decks, underfloor areas, etc.).
- k) Creating additional roadside clearance from the Project Site to the Templin Highway interchange at I-5 to allow for greater use of Evac Point #3.



### Additional Regional Enhancement

The Genasys Protect is an evacuation management tool that helps communities, and first responders, more effectively plan, communicate, and execute evacuations. It is a platform where residents can look up their addresses using the search bar and use the zone map to find evacuation information for their area.

Pre-established evacuation zones help fire, law, and emergency service agencies prepare for, streamline, and reduce confusion around the evacuation process so that roads are clear for those who need to evacuate quickly. Evacuating the most at-risk zones first, emergency personnel are able to manage the traffic flow and more easily prevent the traffic jams that occur when an entire town or city tries to evacuate all at the same time. The pre-established zones also provide a common reference system for all first responders and the community.

Evacuation routes are always incident-specific because the best route to take is always relative to the location and type of threat. When an emergency evacuation occurs, residents will be asked to check the county's alerts and open Genasys Protect application to review the status of their zone. When it's time to evacuate, residents will be asked to follow the direction of the law enforcement directing traffic.

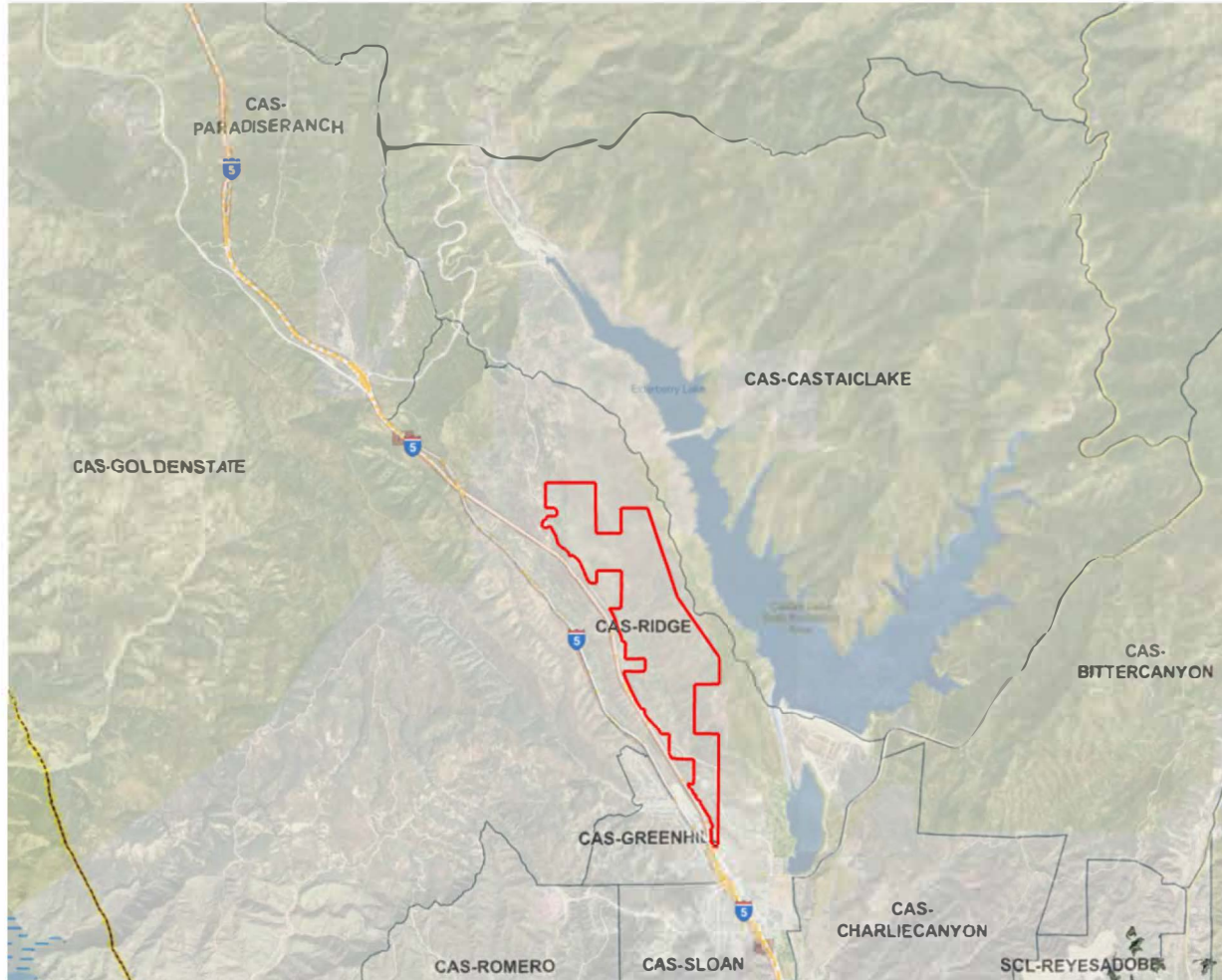
The Genasys Protect mobile app for Apple and Android contains all the same functions as the website, with the additional feature of being able to follow a zone to receive push notifications about status changes to that zone. It should be noted that the Genasys Protect is not a navigation tool like Google or Apple Maps, which means it cannot plot directions or receive evacuation directions.

All zones in Genasys Protect are published by the county and are authoritative. Genasys works directly with each county we serve and all information for a zone or county listed on the site has been approved by the county. The county worked directly with Genasys to add and approve all of the information for specific zones, and the appointed emergency response personnel update the statuses and information during emergencies.

The first three letters represent the city's name or if in an unincorporated area - the county, the E is short for Evacuation, and the last three numbers are the unique code that distinguishes the zone from the others in your area. This system is consistent across your county and makes it easy for first responders to plan and execute evacuations. The zone identifier system provides each zone with a globally unique ID so there is no confusion about which zone is being referred to.

During an incident, first responders may need to split your zone into multiple sections in order to evacuate community members or repopulate a zone in the most effective way. If a zone contains a letter on the end (example: E005-A, E005-B, E005-C), this means that the original zone (E005) was split up into smaller areas for better management of the evacuation.

The project site is with zone CAS-RIDGE, as shown below



## Conclusions and Recommendations

A review of the expected fire behavior in the interface of the NorthLake development indicates that the fire behavior could produce extreme fire behavior and as such, mitigation will be necessary. Many of these mitigation measures are required by the State and Local fire/building regulations, fire department standards and guidelines, and by mitigations already considered and applied by the development review processes to the Previously Approved Project. Fire behavior modeling predicts that there will be several hours in which to evacuate the Project Site under fire scenarios where the fire is burning into the community from an adjacent area under each of the development scenarios considered, except with the Freeway Spots scenario, where all configurations will be able to use Ridge Route Road for the initial 30 minutes and then have a period of time where Ridge Route Road is impacted for 90 minutes or more and would require sheltering in place within the development for this period. Where fires are initialized within the Project Site or near its boundary, the fire incident command and control will have to determine if the population will be moved or “sheltered in place”.

The proposed community with its increased built-in fire protection features (defensible space, fuel modification, hardening of the structures and required maintenance), placement of the structures on the topography, overall orientation to the fuels, wind and slope and nested (safe center) configuration would be a candidate for a “shelter in place” decision. While “shelter in place” is never a first option, history shows us that moving populations, once the fire has arrived, has increased risk and should not be attempted when safe alternatives exist.

The configuration of the Project Site, the placement of the structures and features on the topography and the nature of the wildland fuels surrounding the project create conditions where the fire will travel at great speeds when wind, slope and fuel align but the three access points that empty onto Ridge Route Road are not impacted by fire at the same time.

The fire behavior modeling in this report with flame lengths of up to 65’ under the worst-case scenario would be protected by compliance with the LACFD fuel modification standards. Fuel modification is designed to reduce and change the fuel types as the combustible vegetation gets closer to the structure. As “rule of thumb” two times the maximum flame length is adequate protection from radiant heat in a hardened structure. This concept is shown in Figure 58.

These distances also protect from direct flame contact (distance greater than flame length by a factor of two) and convected heat (less impactful than the radiant heat distance as discussed previously). The structure hardening (including ember intrusion protection) protects from embers and brands which may travel long distances under worst-case conditions.

With respect to the defensible space distance for the perimeter structures, the LACFD requires distances up to 200 feet of fuel modification depending on the adjacent fire potential as measured by the slope, aspect, fuel characteristics, fire history and weather data (wind, temperature and relative humidity). While the distance required in the thinning zones may be allowed to be reduced based on the level of hazard present, the zones nearest the structures are rarely reduced.

Additionally, the implementation of the Zone 0 (first five feet from the structure) and LACFD’s decision to make the fuel modification zone on all sides of the structure and not just the wildland interface will only enhance the already robust level of protection for the Project Site.



## Los Angeles County Fire Department Fuel Modification Design Criteria

### Standard Prescribed 200-foot Fuel Modification Zone

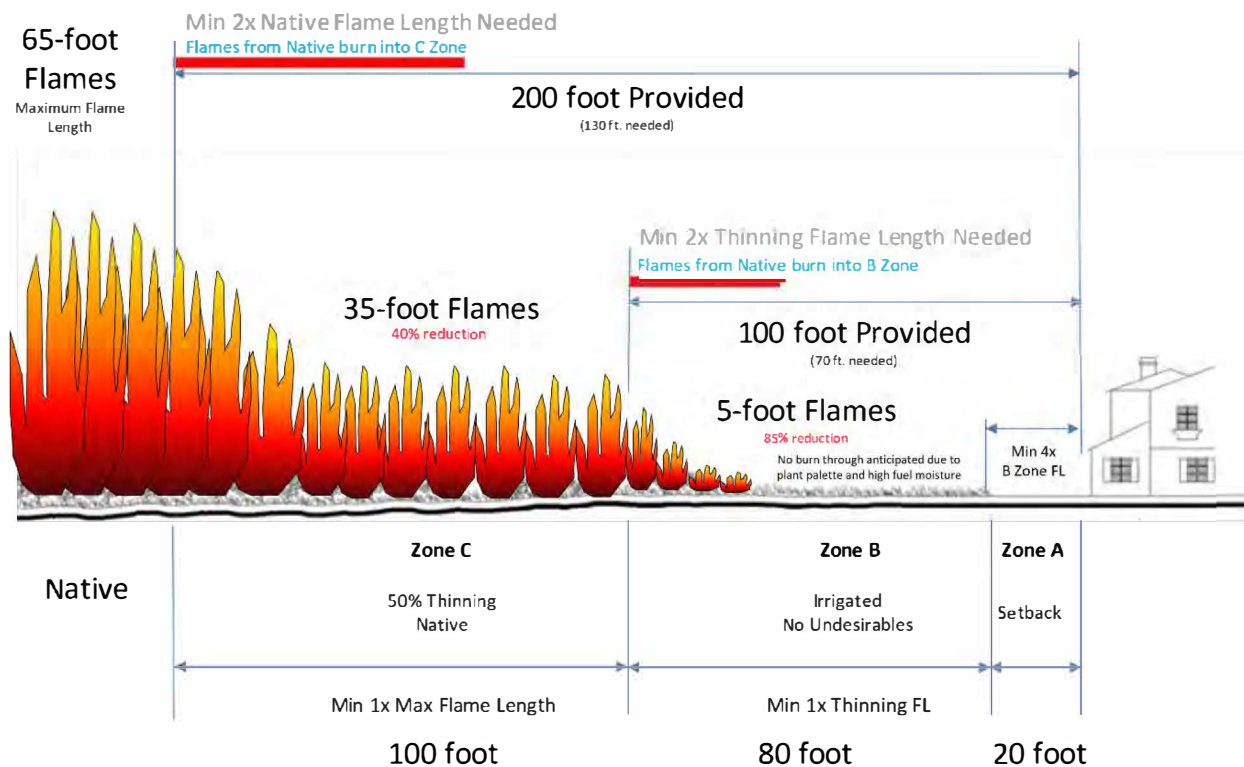


Figure 58 – Fuel Modification Zone Design Criteria

With respect to the tasks as outlined in the California Attorney General’s “Best Practices for Analyzing and Mitigating Wildfire Impacts of Development Projects Under the California Environmental Quality Act” the report has the following conclusions:

#### 1. Determination if project impact will substantially impair an adopted emergency response plan or emergency evacuation plan;

The Project Site general area does not have an adopted emergency evacuation plan. The emergency response plan will be enhanced with the addition of the new fire station and improvements to the public roadways. The evacuation analysis for this Project will be the first formal process that can be found in a search of the available records. Previous evacuations in the area from several incidents over the past years have provided the emergency staff with experience that is helpful for future actions. One example is the closure of Interstate 5 due to an emergency. In previous closures, the action was to take traffic off the freeway at Lake Hughes Road which results in almost immediate gridlock. Shutting the freeway at Hasley Canyon Road or State Route 126 provides for better redirection of the freeway traffic and leaves the Castaic area more evacuation options.

From a wildland fire perspective, the Project Site will not substantially impair an adopted emergency response plan or emergency evacuation plan. Project Site specific plans will

be completed as an integral part of Resident Information and Community Communications efforts by the Project Site sponsors, builders and the ultimate HOA's who will have the ongoing responsibility for this information.

**2. Determine the project-specific Wildland Fire Hazard and Wildland Fire Risk to quantify issues that may exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;**

This report has examined the project specific Wildland Fire Hazards and the resulting Risks after the mitigations are in place and found that the level of Risk that results is no greater than similar communities in the area and generally better than projects constructed prior to the current Regulations. The Project Site has three egress points which are available for evacuation efforts should law enforcement deem it necessary. Additionally, the combination of fuel modification, hardened structures, the placement of the structures and features on the topography relative to the wildland fuels creates a community that is capable of "sheltering in place" if necessary. While never a first choice by emergency service providers, if moving the population is a greater risk, this community as designed and as it will be constructed is capable of a sheltering operation without undue risk to the residents.

All fire scenarios that have been modeled have at least one Evac Point which is viable for 4 hours or more with the exception of the Freeway Spots scenario where only 30 minutes is available prior to a 60 to 90 minute impact where it would be necessary to shelter within the community until the fire passed this point and the egress route is reopened. It should be noted that, by the time the fire reaches the third evacuation point, the first point is available for use by traveling through the center of the development area. All of the fire scenarios are run under extreme conditions which have been recorded in previous fires or which are likely to occur in the future; they are worst-case scenarios.

Evacuation reduces exposure to pollutant concentrations generated by a wildfire. The combined effects of the fuel modification, roadside clearance, wildland fire building code requirements and the design/placement of the structures on the topography work together to protect the community from a wildfire. The Project Site will, in fact, provide a buffer to some of the existing communities by removing or modifying the wildland fuels which are upwind from them.

With the fuel modification and roadside clearance in place, the probability of a fire originating from the Project Site is lower than the adjacent communities without this protection. In order to access the wildlands, it will be necessary to traverse either the 200' fuel modification zone or the 50' roadside clearance zone. Ignitions from the normal sources associated with development will be much less likely to occur.

- 3. Determine if the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment;**

All of the improvements for the Project Site have been identified and analyzed for their impact on the environment in the CEQA process. None of the Project Site infrastructure will exacerbate the fire risk for the Project Site. In fact, the improved water supply for the general area, the placement of fuel modification zones and the establishment of a community which has the option to “shelter in place” if needed provides an alternative to the existing residents where this level of protection does not exist. If evacuation to the south is not possible, nearby communities would be safer in the Project Site development areas than they would be in some of the current neighborhoods due to the added protections provided in the Project Site.

- 4. Determine if people or structures will be exposed to significant risks due to the completion of the project; and**

The required wildland fire protection features identified in this report, will keep the residents and the structure of the Project Site protected from significant risk by the required Regulations, the manner in which the Project Site will be developed (clustered development with a definable interface vs an intermix community). The risk from wildland fires for the Project Site will be less than the surrounding communities as the Regulations under which the Project will be developed have significantly increased the level of protection required as a baseline for development projects. The protection measures listed in this report have reduced the hazards in the adjacent native vegetation to an acceptable level of risk under current Regulations.

- 5. Consider whether a project will “expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires”.**

As proposed, the Project Site will not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death due to a wildland fire in the native areas adjacent to the Project Site due to the use of Fuel Modification, Defensible Space, Fire Sprinklers, placement of the structure on the Landscape/Topography, the width of the streets, the amount of fire protection water available and the placement of the fire hydrants are specified intervals, the hardening of the structures to comply with the current wildland interface Regulations and availability of firefighter resources within the Project Site and the regional assets available to combat a wildland fire by LACFD and the other associated agencies (CalFire, USFS, mutual aid fire resources, Call when needed fire resources) who routinely assist in the suppression of wildland fire in the region.

It has been determined that, with the implementation of the mitigation measures set forth in this report, the proposed development areas set forth as project configurations (Previously Approved Project, Creek Avoidance Alternative, Partial Creek Avoidance Alternative) will have a less than significant impact from the wildland fire related issues raised under the AG Guidelines, as well



as under CEQA Guidelines Appendix G, Section XX Wildfire. One modeled scenario (Freeway Spots) is a rapid developing event which does require sheltering within the community for a period of time but does not put the residents directly at risk from the fire during this period as the Project Site has been designed to provide for that scenario.

## Appendix A

### Site Photos Locations

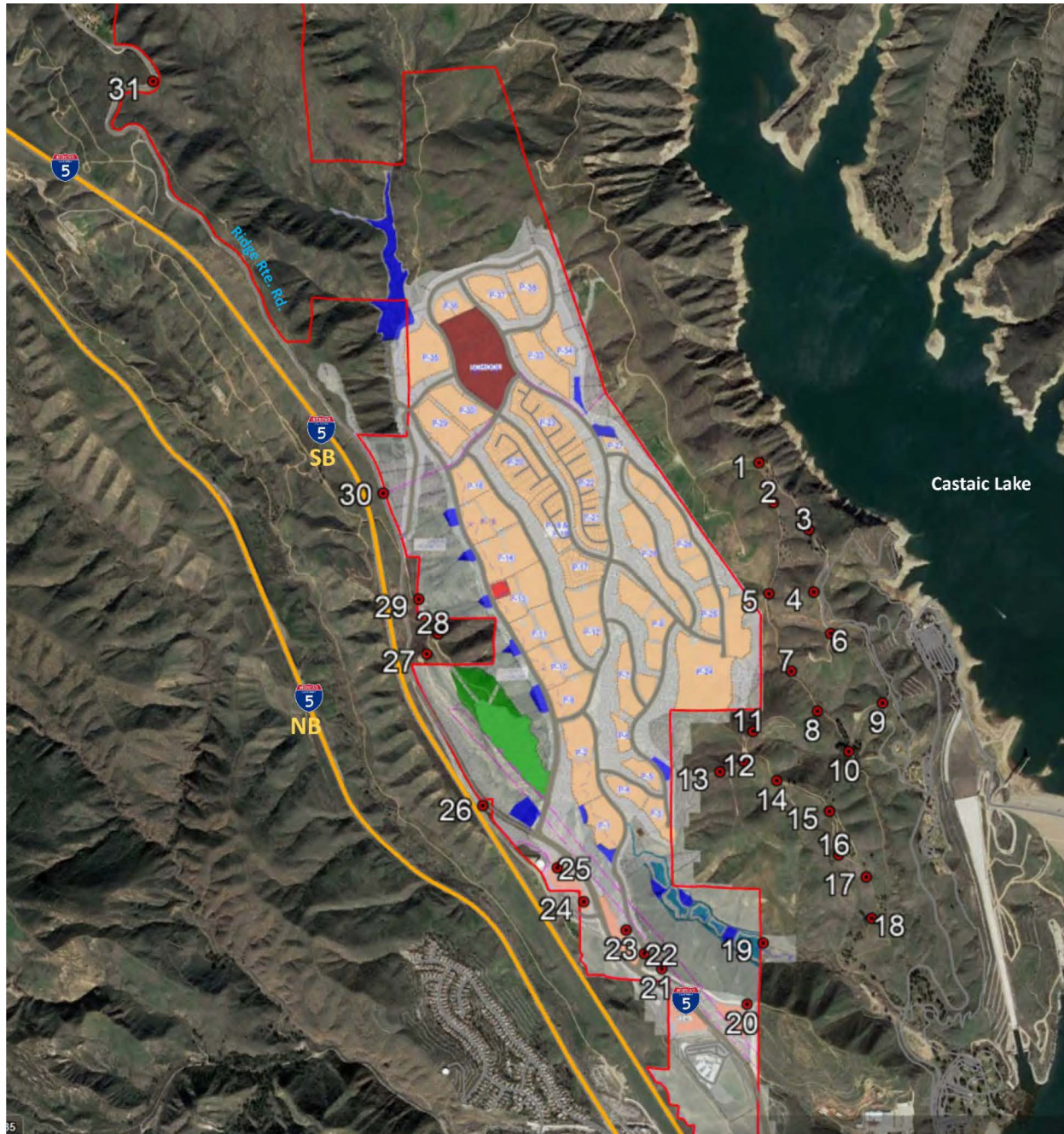


Photo locations are shown on the map above as reference points. Several photos were taken from each general location and are within a few feet of each other. For simplicity, these photo site have been grouped in the locations are shown above.



**Photo Site 1 – Looking West**



Looking South





**Photo Site 2 – Looking West**



**Looking North**

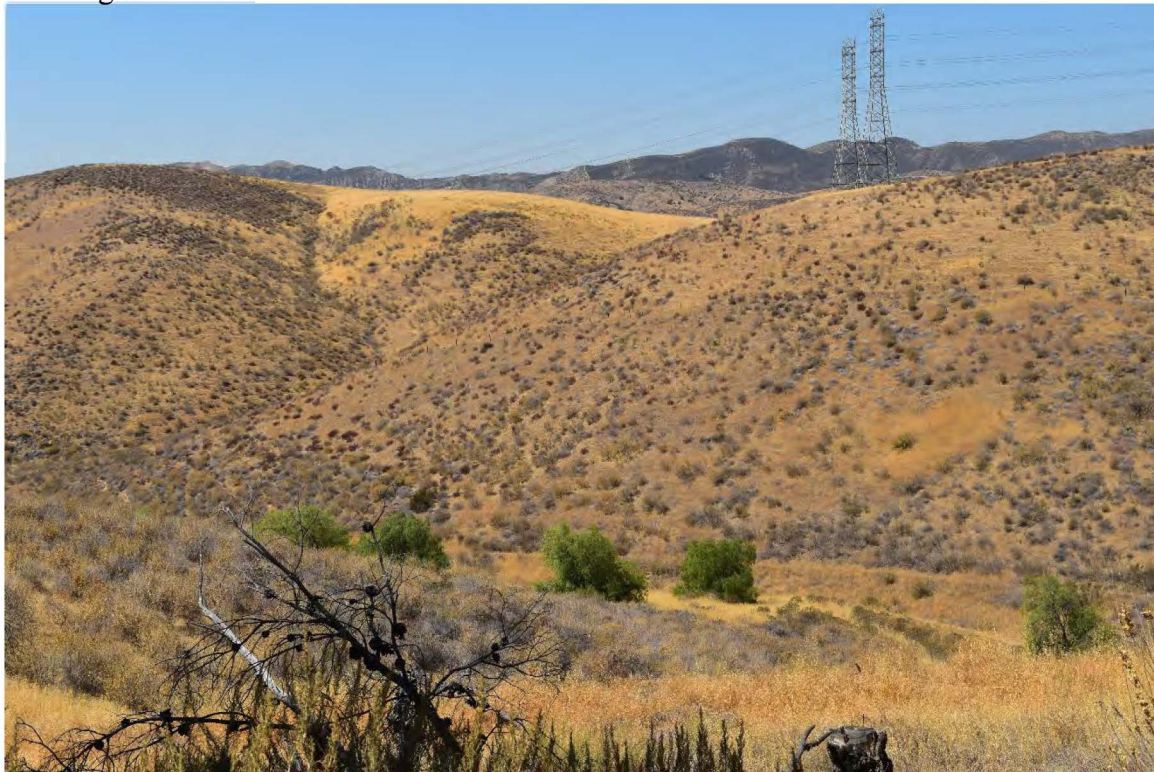




**Photo Site 3 – Looking West**



**Looking Southwest**





**Photo Site 4 – Looking West**



Looking Northwest





**Photo Site 4(cont.)** – Looking Southwest



Looking South





**Photo Site 5 – Looking North Northwest**



Looking Northwest from a few feet up the road





**Photo Site 6 – Looking West**



**Looking South**





**Photo Site 7 – Looking West**



**Looking Northwest**





**Photo Site 8** –Looking Northwest



Looking West





**Photo Site 9 – Looking West Southwest**



**Looking Northwest**





**Photo Site 10 – Looking West**



Looking North Northwest





**Photo Site 11** – Looking North



Looking Northwest





**Photo Site 12** – Looking Southeast



Looking Southwest





**Photo Site 13** – Looking South



Looking Northwest





**Photo Site 14** – Looking Southeast



Looking South





**Photo Site 15** – Looking Southwest



Looking North





**Photo Site 16 – Looking West**



**Looking North**





**Photo Site 17 – Looking West**



Looking Northwest



**Photo Site 18** –Looking Northwest



Looking North Northwest





**Photo Site 19 – Looking Southwest**



**Looking Northwest**





**Photo Site 20 – Looking North**



**Looking Northwest**





**Photo Site 21 – Looking East**



**Looking Northwest**





**Photo Site 22 – Looking East**



**Looking North**





**Photo Site 23** – Looking North



Looking North Northwest





**Photo Site 24** – Looking Southeast



Looking North





**Photo Site 24 (cont)** – Looking Northeast



Looking North Northwest





**Photo Site 25** – Looking North



Looking North Northwest





**Photo Site 26** – Looking East Northeast



Looking Southeast





**Photo Site 27**– Looking South Southeast



Looking South Southeast from under powerlines





**Photo Site 28** – Looking North Northeast



Looking East





**Photo Site 29** – Looking North



Looking Southeast





**Photo Site 30 – Looking East**



**Looking South**





**Photo Site 31** – Looking Southeast



Same as above zoomed in



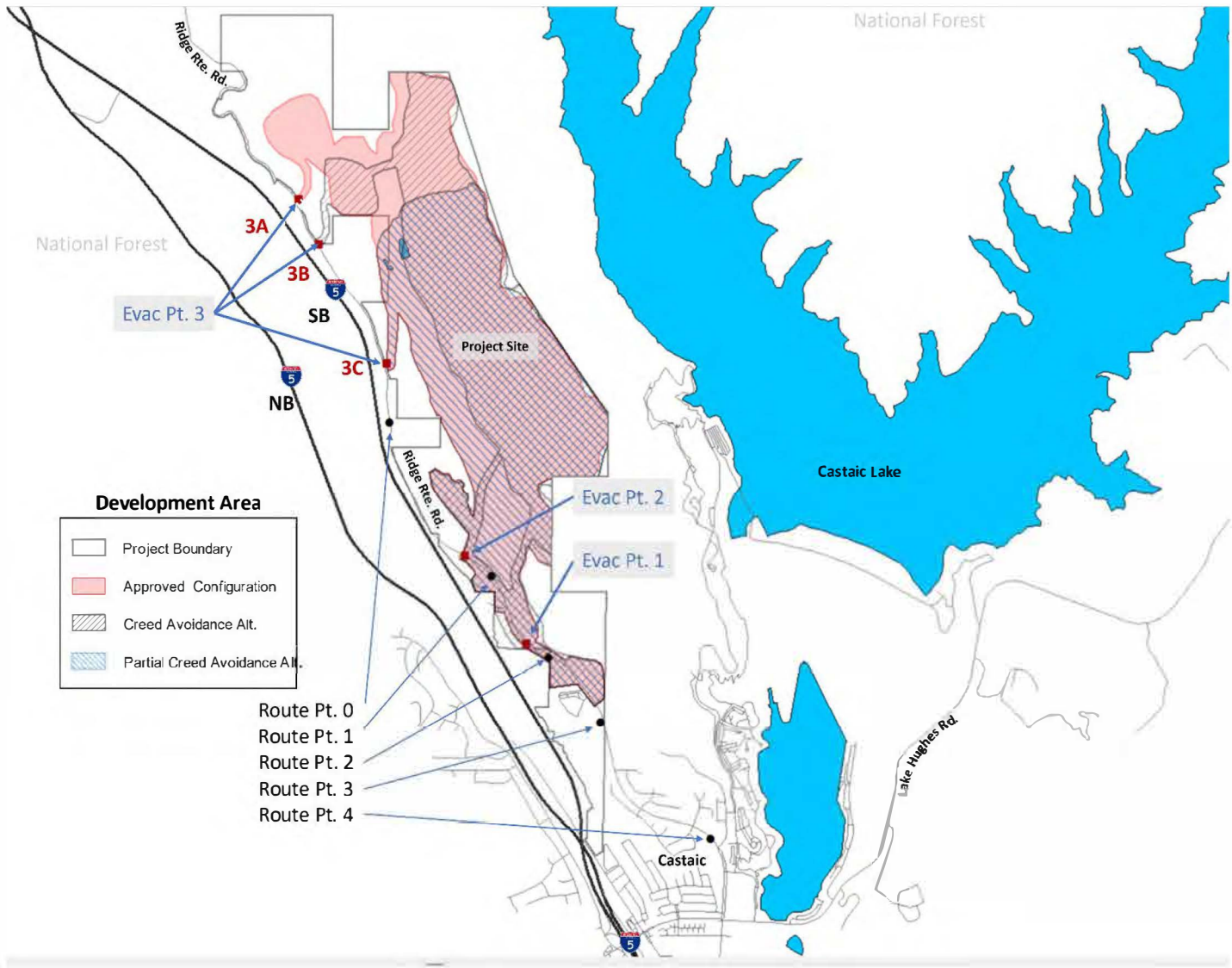


# Appendix B - Fire Behavior Analysis Outcomes for Evacuation Modeling

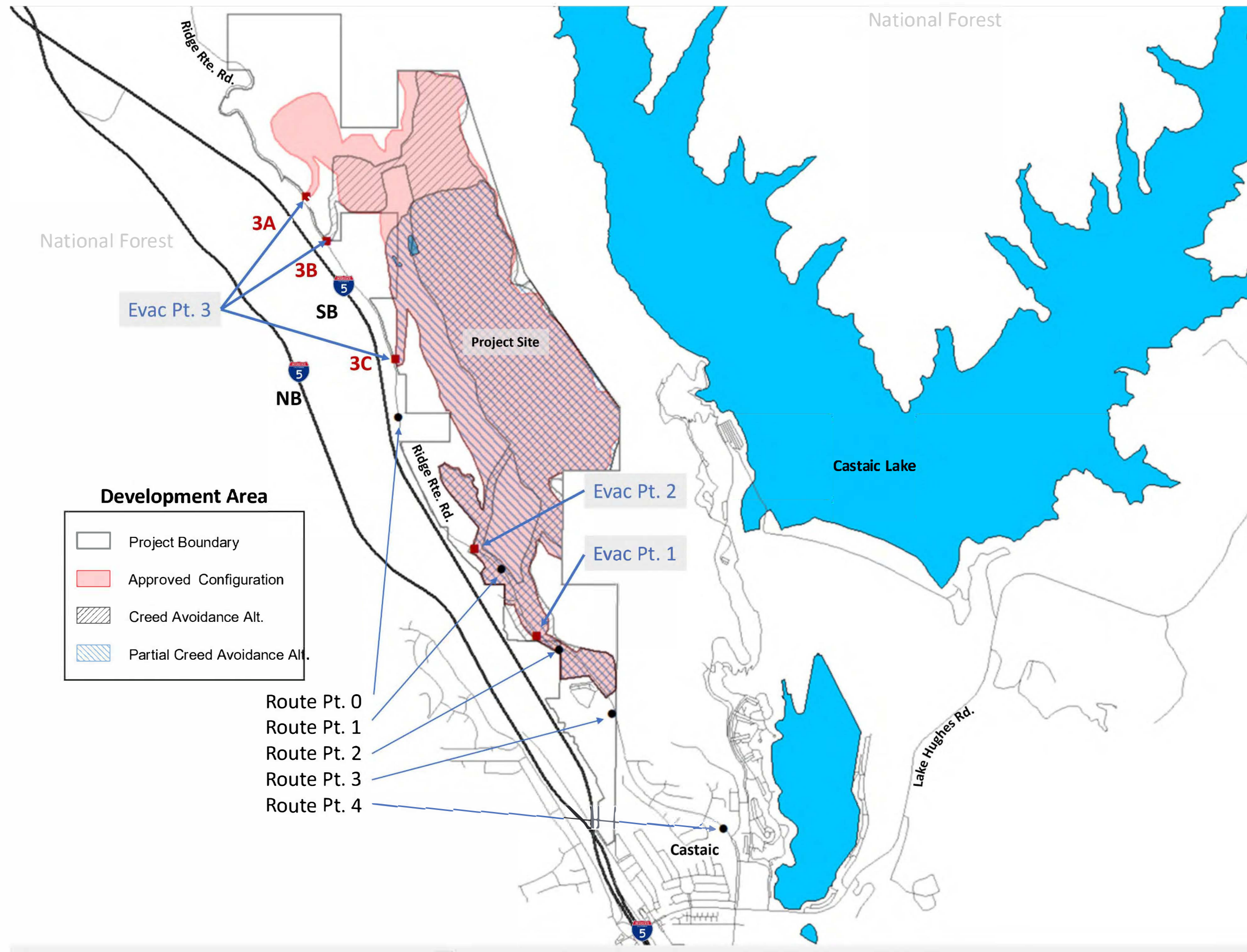
The attached outputs from the FlamMap fire behavior modeling at for the MTT (Minimum Travel Time) module. Every scenario has been completed with each of the three project configurations (Approved, Creek Avoidance and Partial Creek Avoidance configurations). Assumptions on spotting and timeframes are shown on each output. Minutes are used up to 90 minutes and hours are used for longer periods.

Evacuation Points 1 and 2 are identical for all three configurations Evacuation Point 3A is for the Previously Approved Development Configuration, Point 3B is for the Creek Avoidance Configuration and Point 3C is for the Partial Creek Avoidance Configuration as shown on the map below. Route Points are the same for all scenarios.

Each Evacuation Point and Route Point is provided with which when it will be open or closed in 15-minute increments as shown in the sample matrix below. One is provided for each scenario.



Route Fire Sim 25 mph Approved		Evacuation to the South									
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
30	0:30	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
45	0:45	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
60	1:00	Open	Closed	Open	n/a	n/a	Closed	Open	Open	Open	Open
75	1:15	Open	Closed	Open	n/a	n/a	Closed	Open	Open	Open	Open
90	1:30	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
105	1:45	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
120	2:00	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
135	2:15	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
150	2:30	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
165	2:45	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
180	3:00	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
195	3:15	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
210	3:30	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
225	3:45	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
240	4:00	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
255	4:15	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
270	4:30	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
285	4:45	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
300	5:00	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
315	5:15	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
330	5:30	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
345	5:45	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
360	6:00	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
375	6:15	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
390	6:30	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
405	6:45	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
420	7:00	Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open





Existing Conditions prior to the Route Fire

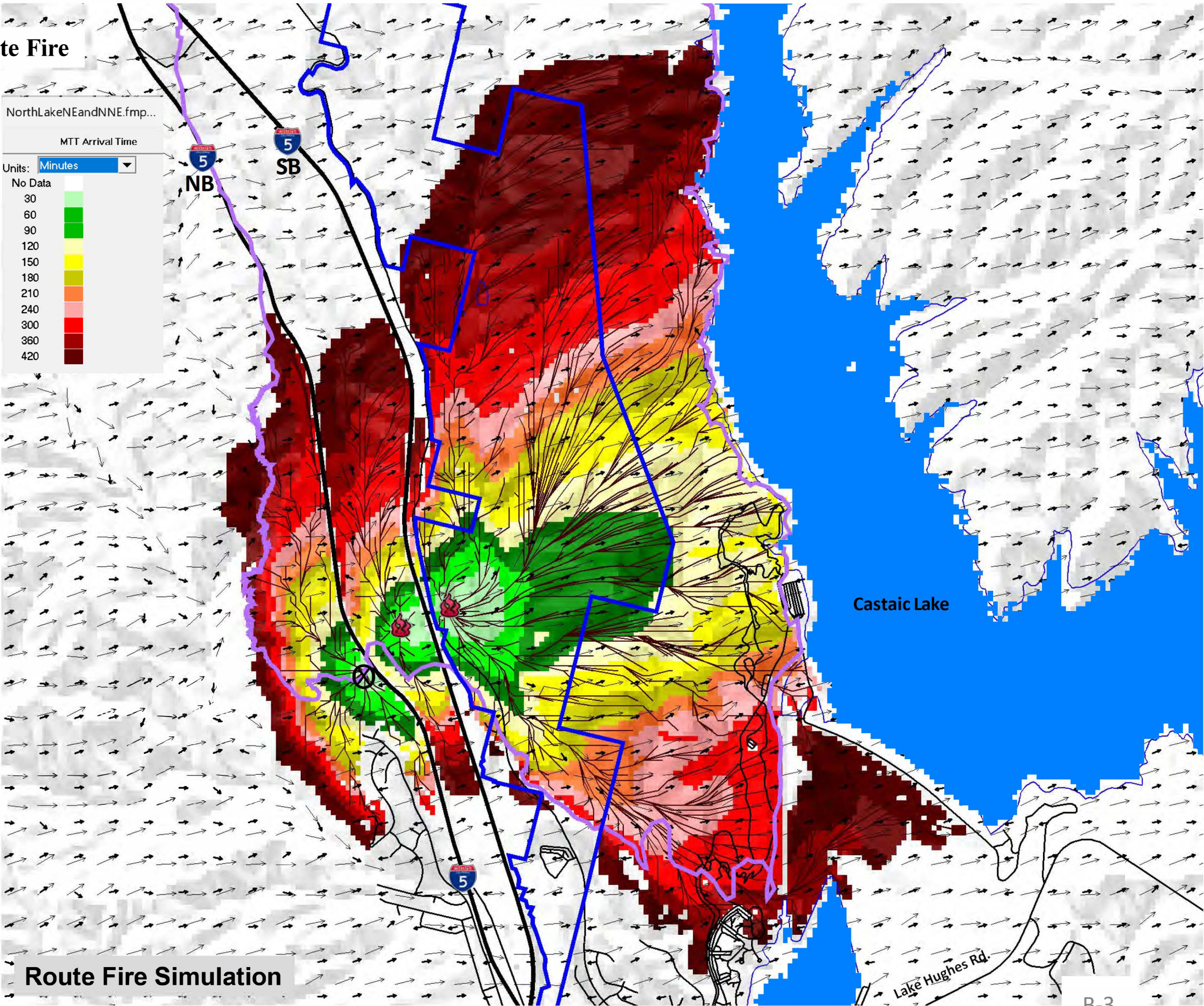
This is the Route Fire with 25mph winds (sustained). The fire was made to spot over the freeways and start again.

Purple line is actual fire perimeter (final). Modeling is for the first eight hours of the fire.

- Streets
- Project Boundary
- Freeway
- Development Area
- Route Fire Perimeter

- Wind Direction
- Spread Direction
- Fire Flow Path
- Origin of the Fire
- Spot Fire

WSW wind at 25

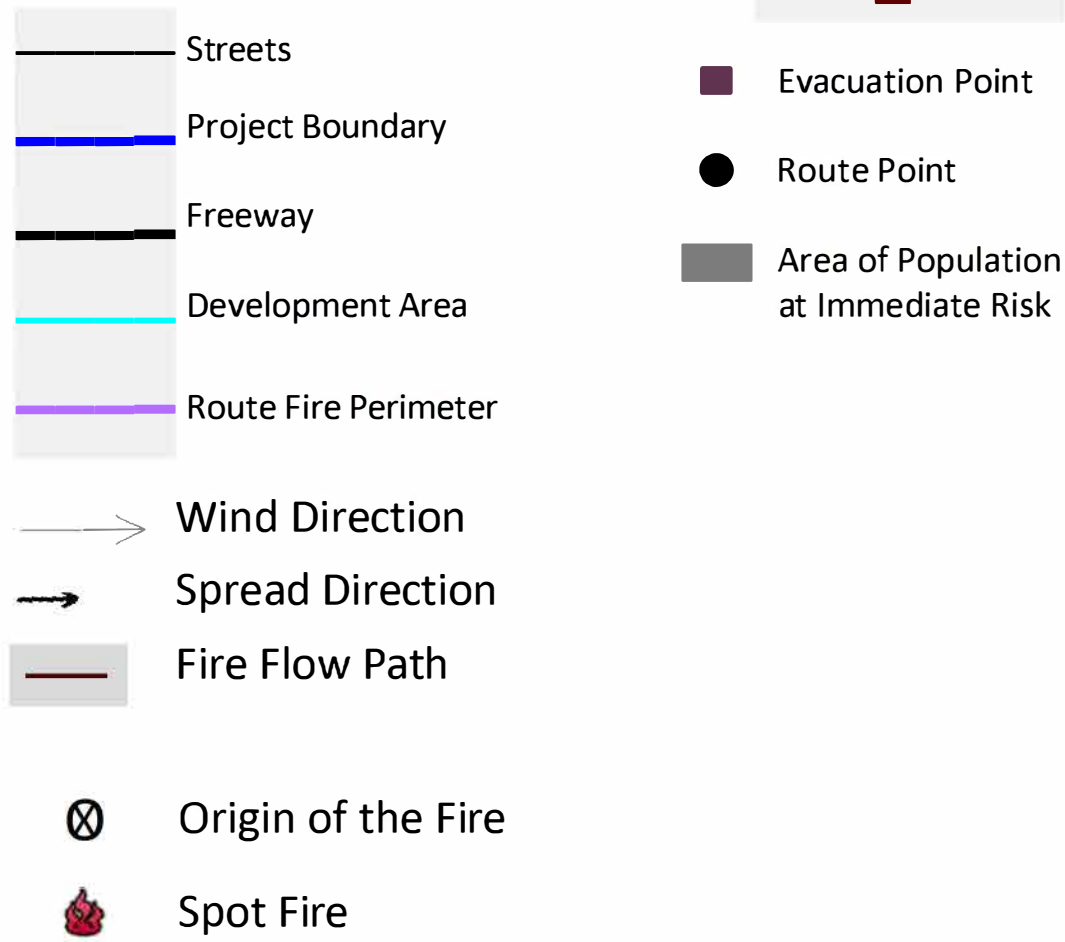




Existing Conditions prior to the Route Fire  
Previously Approved Development Added

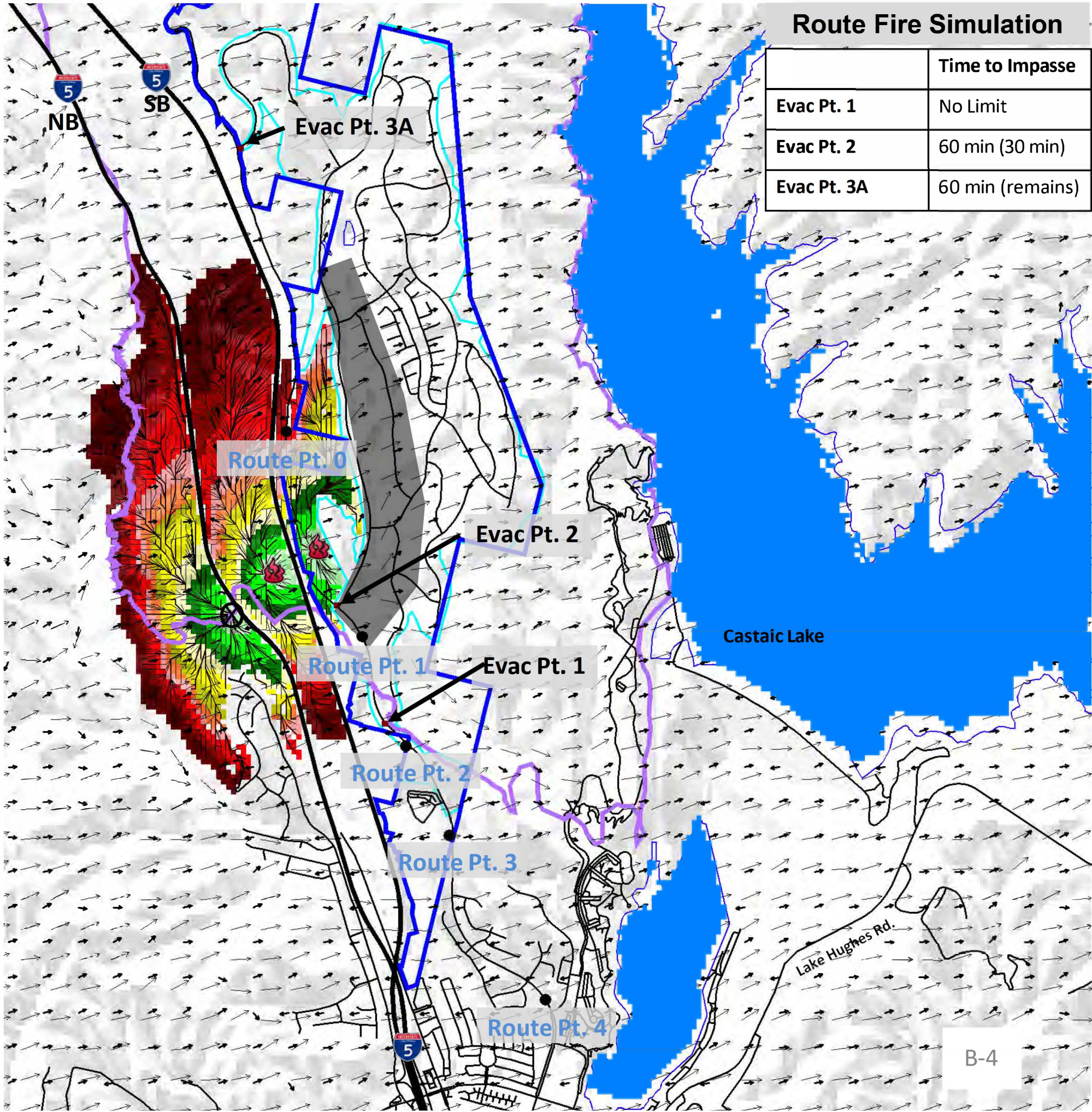
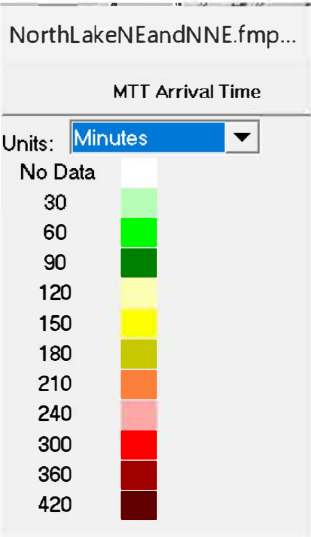
This is the Route Fire with 25mph winds (sustained). The fire was made to spot over the freeways and start again.

Development is modeled as a barrier (no burn through due to fuel modification, plant pallet restriction and structure hardening)



Origin to first spot 30 min.  
First spot to second spot 30 min.

WSW wind at 25

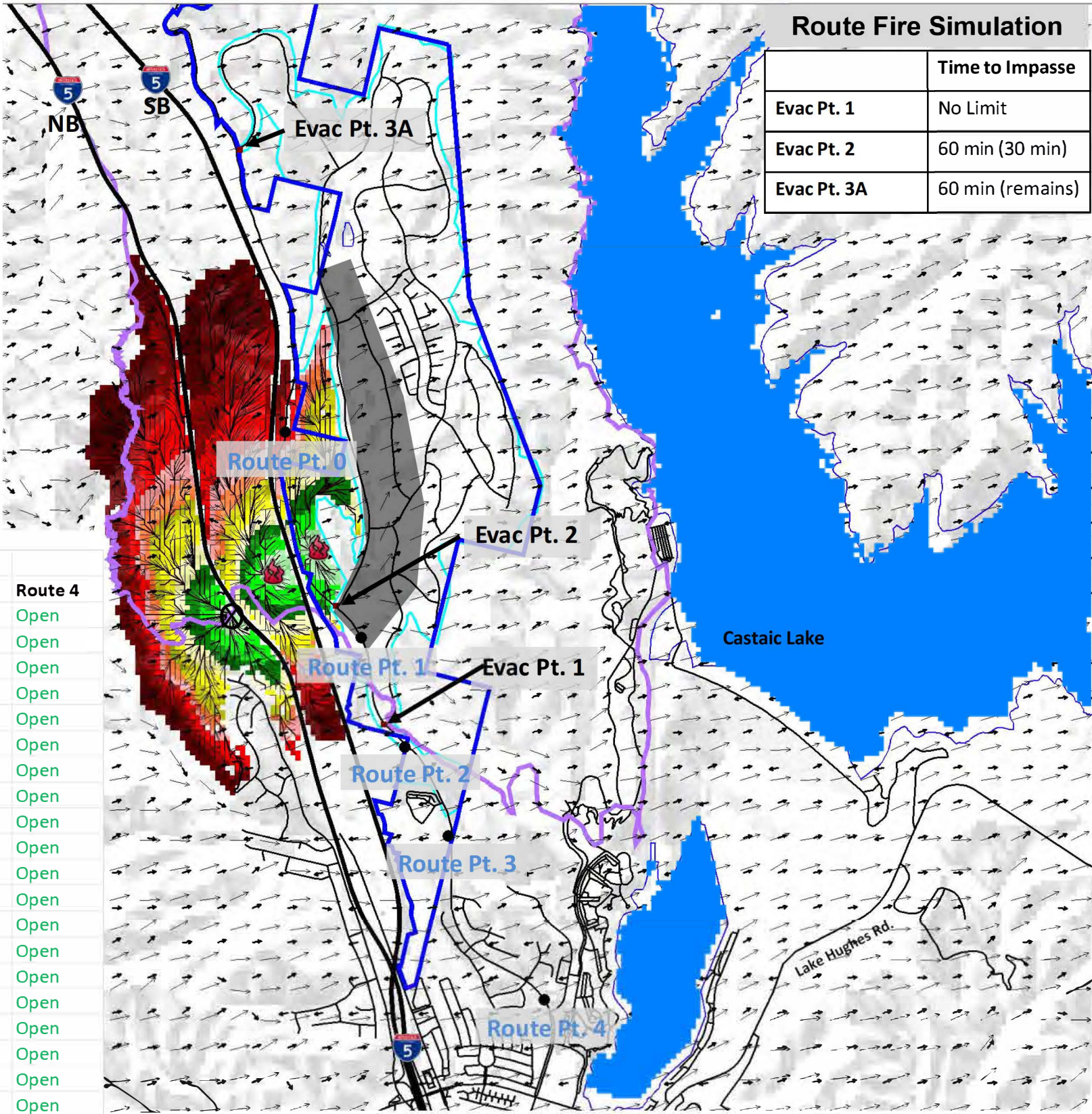




Existing Conditions prior to the Route Fire  
Previously Approved Development Added

Narrative: Fire begins as spot fires west of the northbound I-5 under a WSW Wind at 25 mph with the head fire moving to the northeast (branching to the north and south). At 30 min (elapsed time) fire spots over the NB I-5. The fire continues to burn ENE And spots over the SB I-5 impacting Ridge Route and Evac Point 2 at 60 min (elapsed time) and continues to burn to the north to the north and south along the Project Site.

Route Fire Sim 25 mph Approved						Evacuation to the South				
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
30	0:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
45	0:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
60	1:00 Open	Closed	Open	n/a	n/a	Closed	Open	Open	Open	Open
75	1:15 Open	Closed	Open	n/a	n/a	Closed	Open	Open	Open	Open
90	1:30 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
105	1:45 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
120	2:00 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
135	2:15 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
150	2:30 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
165	2:45 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
180	3:00 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
195	3:15 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
210	3:30 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
225	3:45 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
240	4:00 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
255	4:15 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
270	4:30 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
285	4:45 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
300	5:00 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
315	5:15 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
330	5:30 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
345	5:45 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
360	6:00 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
375	6:15 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
390	6:30 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
405	6:45 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open
420	7:00 Open	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open





This is the Route Fire with 25mph winds (sustained). The fire was made to spot over the freeways and start again.




Streets

Project Boundary

Freeway

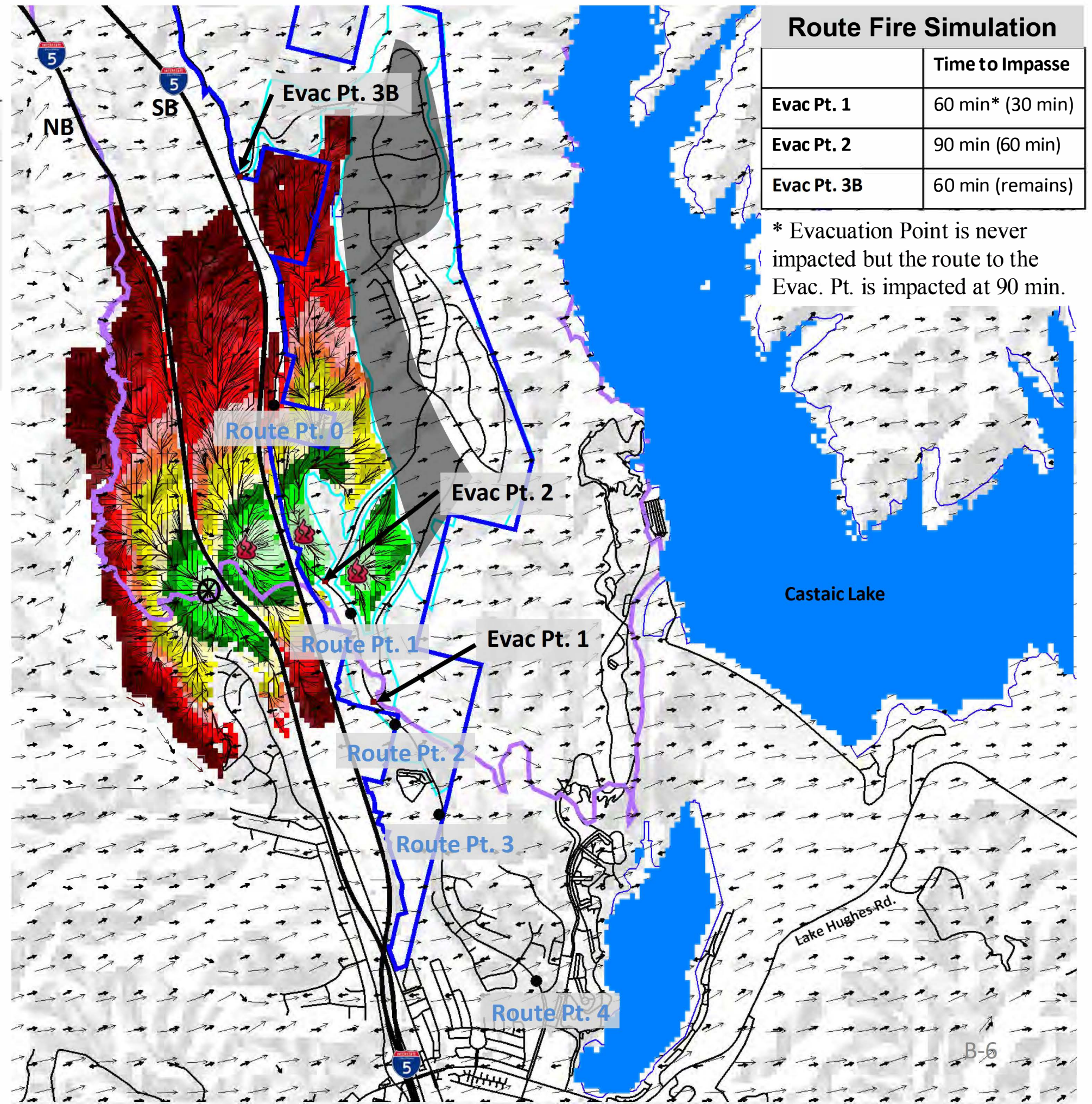
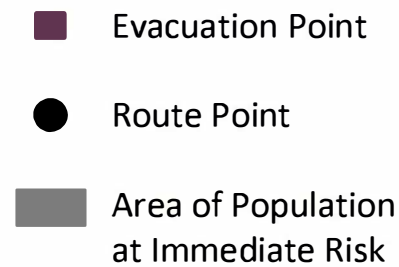
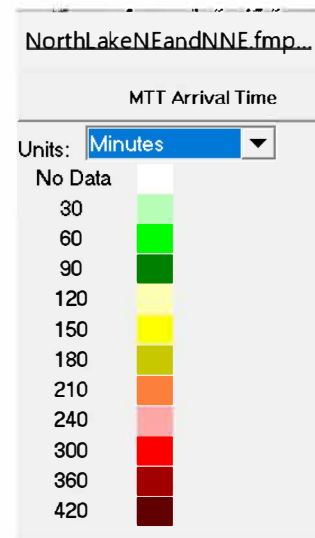
Development Area

Route Fire Perimeter

 Wind Direction  
 Spread Direction  
 Fire Flow Path

- ⊗ Origin of the Fire
- 🔥 Spot Fire

Origin to first spot 30 min.  
First spot to second spot 30 min.  
Second spot to third spot 30 min  
**WSW wind at 25**

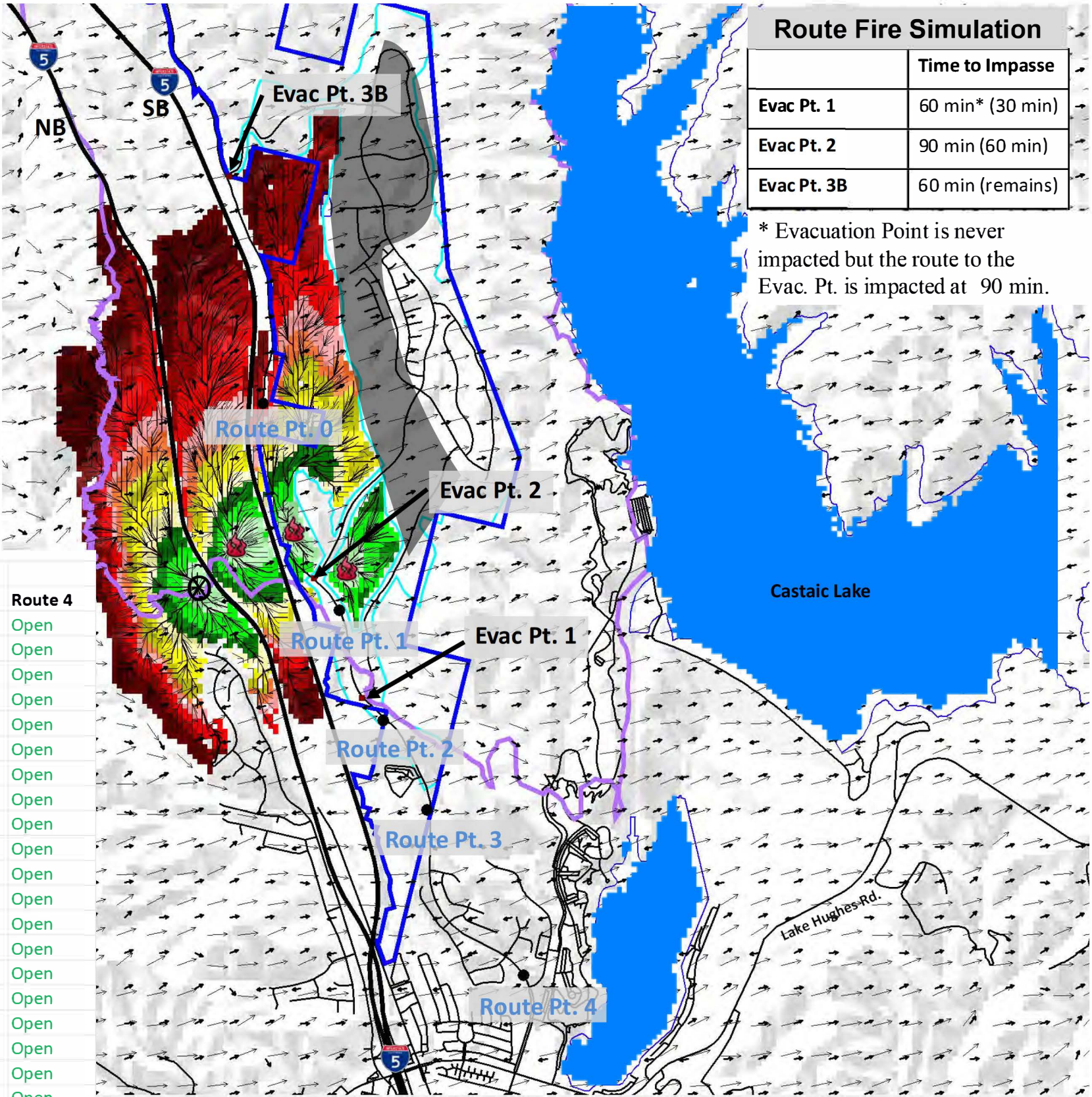




Existing Conditions prior to the Route Fire  
Creek Avoidance Development Added

Narrative: Fire begins as spot fires west of the northbound I-5 under a WSW Wind at 25 mph with the head fire moving to the northeast (branching to the north and south). At 30 min (elapsed time) fire spots over the NB I-5. The fire continues to burn ENE And spots over the SB I-5 impacting Ridge Route and Evac Point 2 at 60 min (elapsed time) and continues to burn to the north to the north and south along the Project Site spotting over Evac Point 2 at

Route Fire Sim 25 mph Avoid		Evacuation to the South									
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
30	0:30	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
45	0:45	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
60	1:00	Open	Closed	n/a	Closed	n/a	Closed	Open	Open	Open	Open
75	1:15	Open	Closed	n/a	Closed	n/a	Closed	Open	Open	Open	Open
90	1:30	Closed	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
105	1:45	Closed	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
120	2:00	Closed	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
135	2:15	Closed	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
150	2:30	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
165	2:45	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
180	3:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
195	3:15	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
210	3:30	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
225	3:45	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
240	4:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
255	4:15	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
270	4:30	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
285	4:45	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
300	5:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
315	5:15	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
330	5:30	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
345	5:45	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
360	6:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
375	6:15	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
390	6:30	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
405	6:45	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
420	7:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open

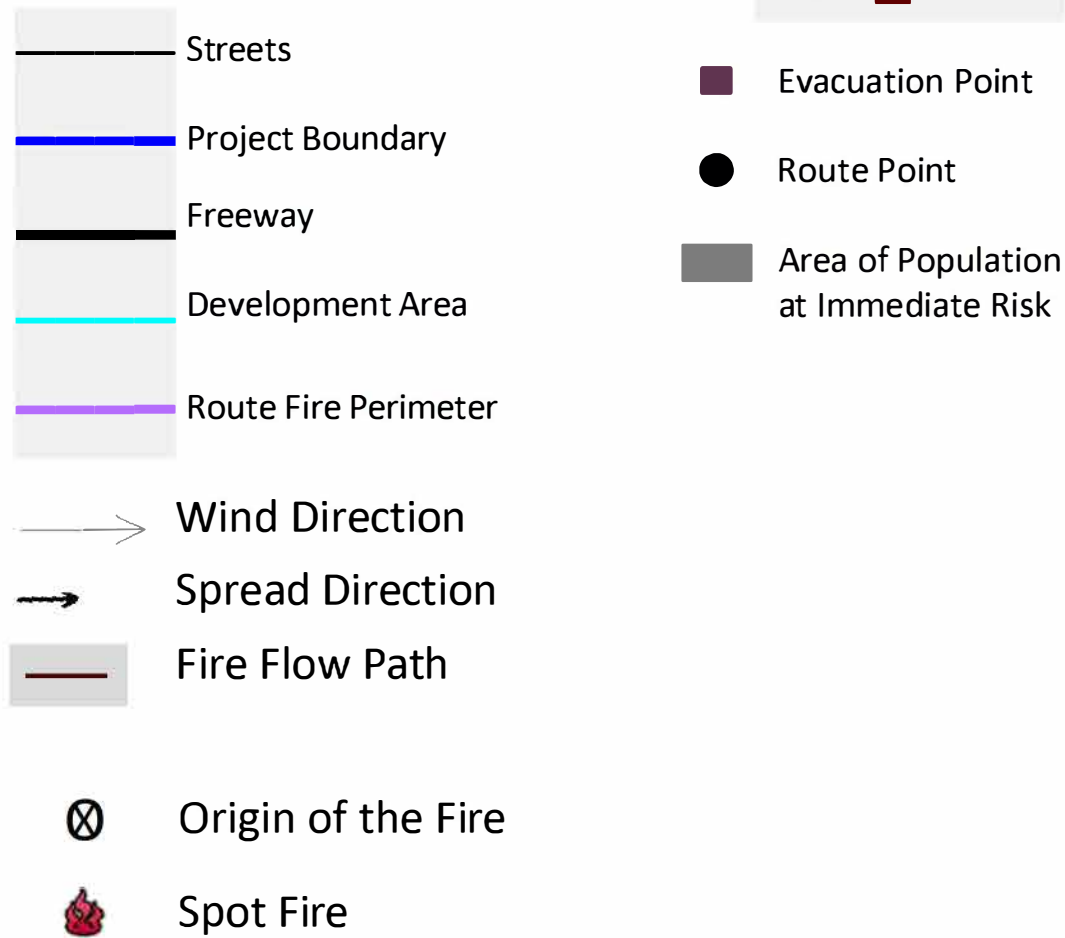




Existing Conditions prior to the Route Fire  
Partial Creek Avoidance Development Added

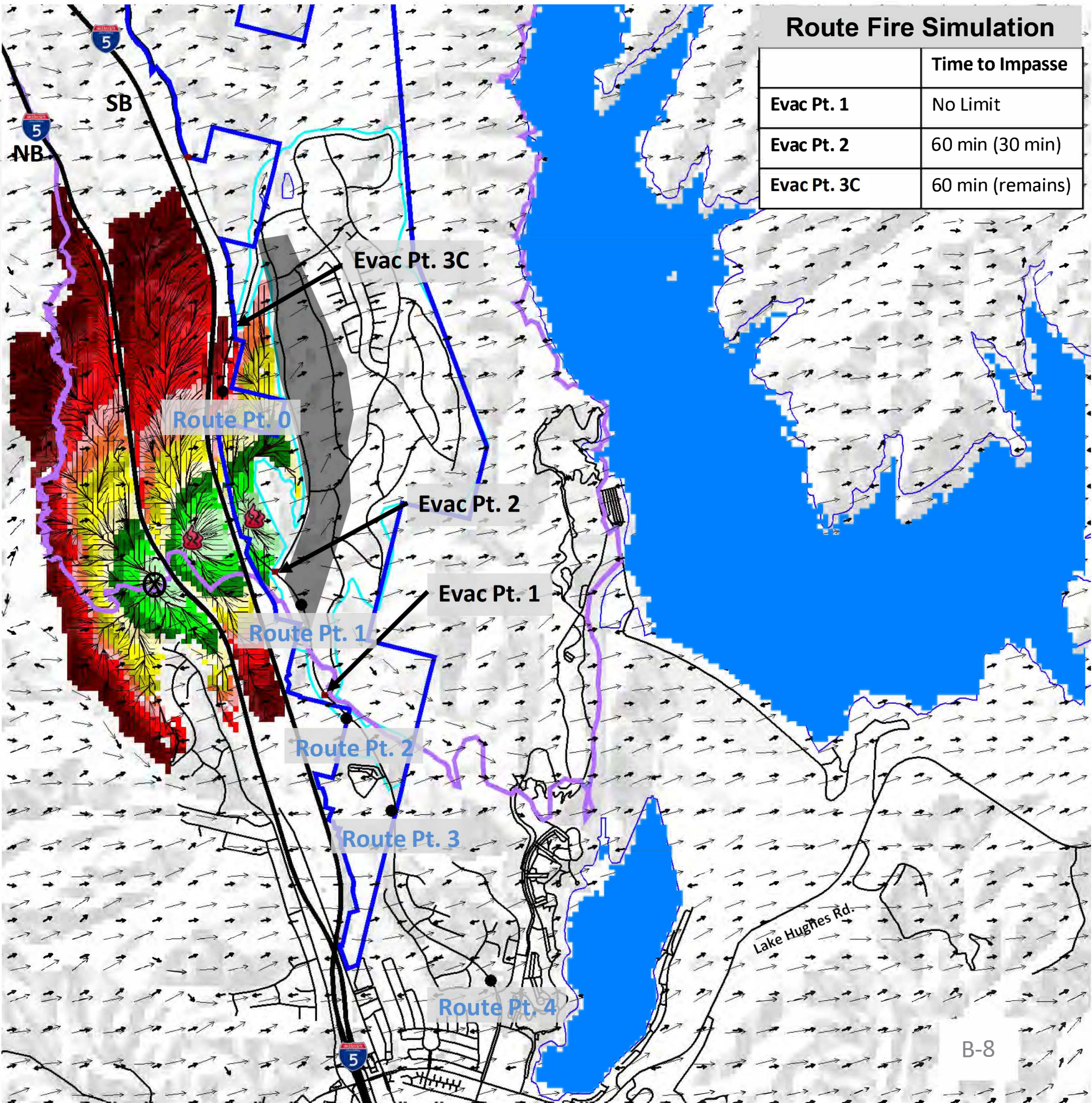
This is the Route Fire with 25mph winds (sustained). The fire was made to spot over the freeways and start again.

Development is modeled as a barrier (no burn through due fuel modification, plant pallet restriction and structure hardening)



Origin to first spot 30 min.  
First spot to second spot 30 min.

WSW wind at 25

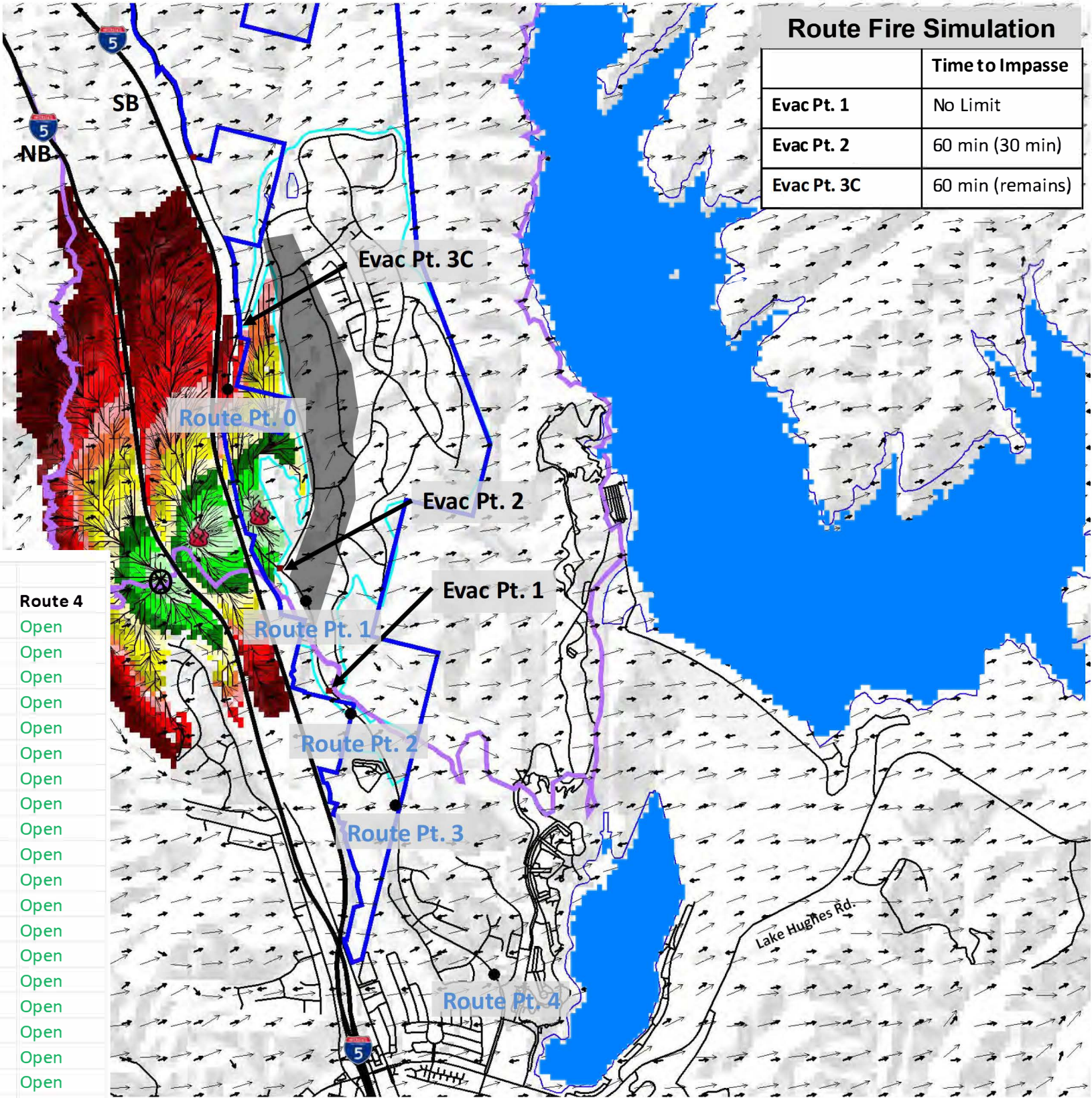




Existing Conditions prior to the Route Fire  
Partial Creek Avoidance Development Added

Narrative: Fire begins as spot fires west of the northbound I-5 under a WSW Wind at 25 mph with the head fire moving to the northeast (branching to the north and south). At 30 min (elapsed time) fire spots over the NB I-5. The fire continues to burn ENE And spots over the SB I-5 impacting Ridge Route and Evac Point 2 at 60 min (elapsed time) and continues to burn to the north to the north and south along the Project Site.

Route Fire Sim 25 mph Partial Avoid		Evacuation to the South									
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
30	0:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
45	0:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
60	1:00	Open	Closed	n/a	n/a	Closed	Closed	Open	Open	Open	Open
75	1:15	Open	Closed	n/a	n/a	Closed	Closed	Open	Open	Open	Open
90	1:30	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
105	1:45	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
120	2:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
135	2:15	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
150	2:30	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
165	2:45	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
180	3:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
195	3:15	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
210	3:30	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
225	3:45	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
240	4:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
255	4:15	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
270	4:30	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
285	4:45	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
300	5:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
315	5:15	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
330	5:30	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
345	5:45	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
360	6:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
375	6:15	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
390	6:30	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
405	6:45	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
420	7:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open

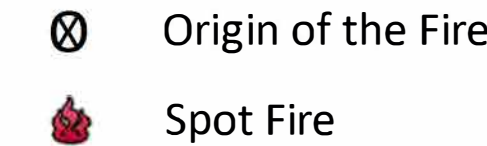
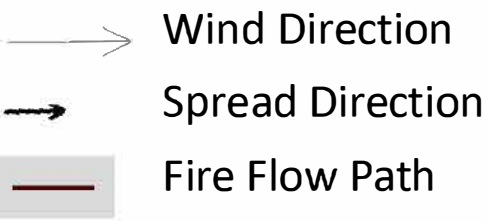
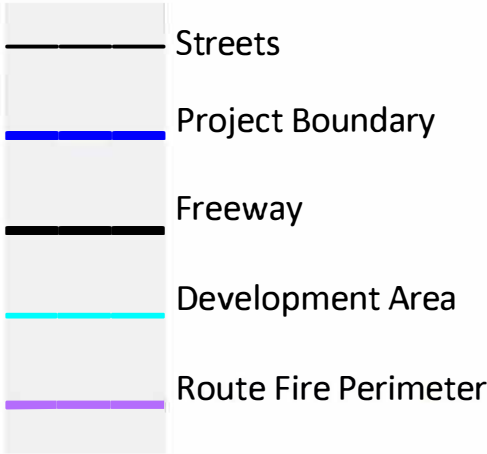




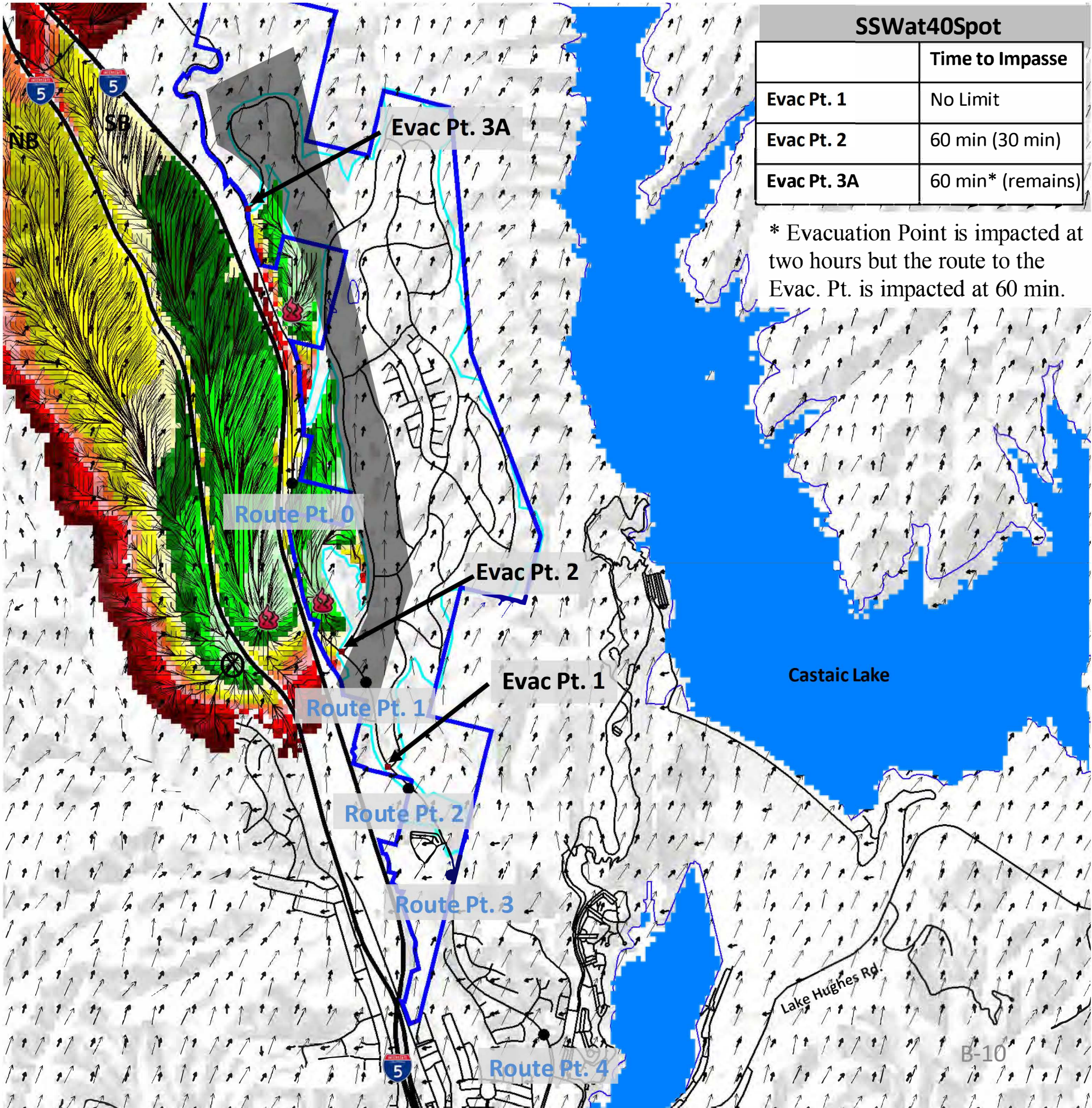
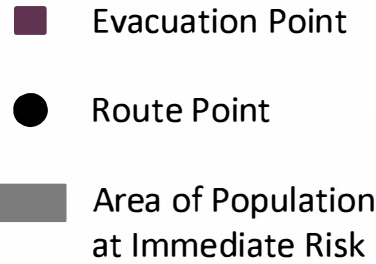
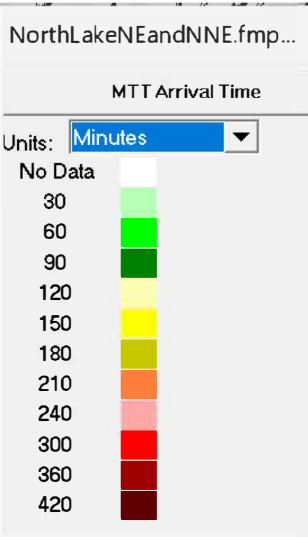
Increased Wind Speed (SSW direction)  
Previously Approved Development Added

This is the Route Fire with 40 mph winds (sustained). The fire was made to spot over the freeways and start again.

Development shown as modified wildland fuels due to fuel modification, plant pallet restriction and structure hardening



Origin to first spot 30 min.  
First spot to second spot 30 min.  
Third spot 60 min.  
SSW wind at 40 Spot



SSWat40Spot	
	Time to Impasse
Evac Pt. 1	No Limit
Evac Pt. 2	60 min (30 min)
Evac Pt. 3A	60 min* (remains)

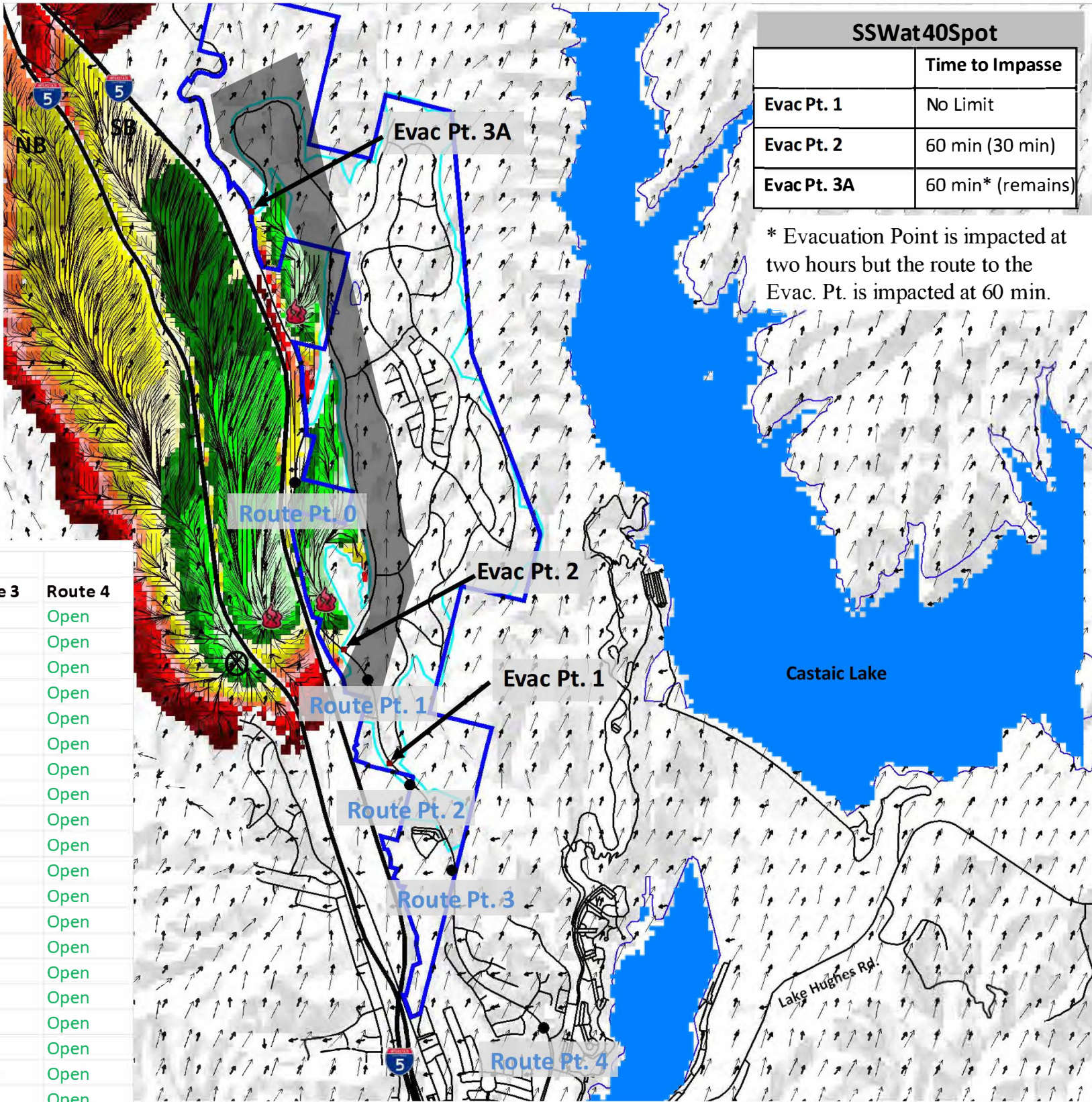
\* Evacuation Point is impacted at two hours but the route to the Evac. Pt. is impacted at 60 min.



Increased Wind Speed (SSW direction)  
Previously Approved Development Added

Narrative: Fire begins as spot fires west of the northbound I-5 under a SSW Wind at 40 mph with the head fire moving to the northeast (branching to the north and south). At 30 min (elapsed time) fire spots over the NB I-5. The fire continues to burn NNE and spots over the SB I-5 impacting Ridge Route north of Evac Point 2 at 60 min (elapsed time). The fire spots over the SB I-5 south of Evac Point 3A at 90 min (elapsed time) continues to burn to the north to the north and south along the west side of the Project Site.

SSW Spot at 40 mph Approved		Evacuation to the South									
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
30	0:30	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
45	0:45	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
60	1:00	Open	Closed	Closed	n/a	n/a	Closed	Open	Open	Open	Open
75	1:15	Open	Closed	Closed	n/a	n/a	Closed	Open	Open	Open	Open
90	1:30	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
105	1:45	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
120	2:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
135	2:15	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
150	2:30	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
165	2:45	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
180	3:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
195	3:15	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
210	3:30	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
225	3:45	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
240	4:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
255	4:15	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
270	4:30	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
285	4:45	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
300	5:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
315	5:15	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
330	5:30	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
345	5:45	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
360	6:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
375	6:15	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
390	6:30	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
405	6:45	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
420	7:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open

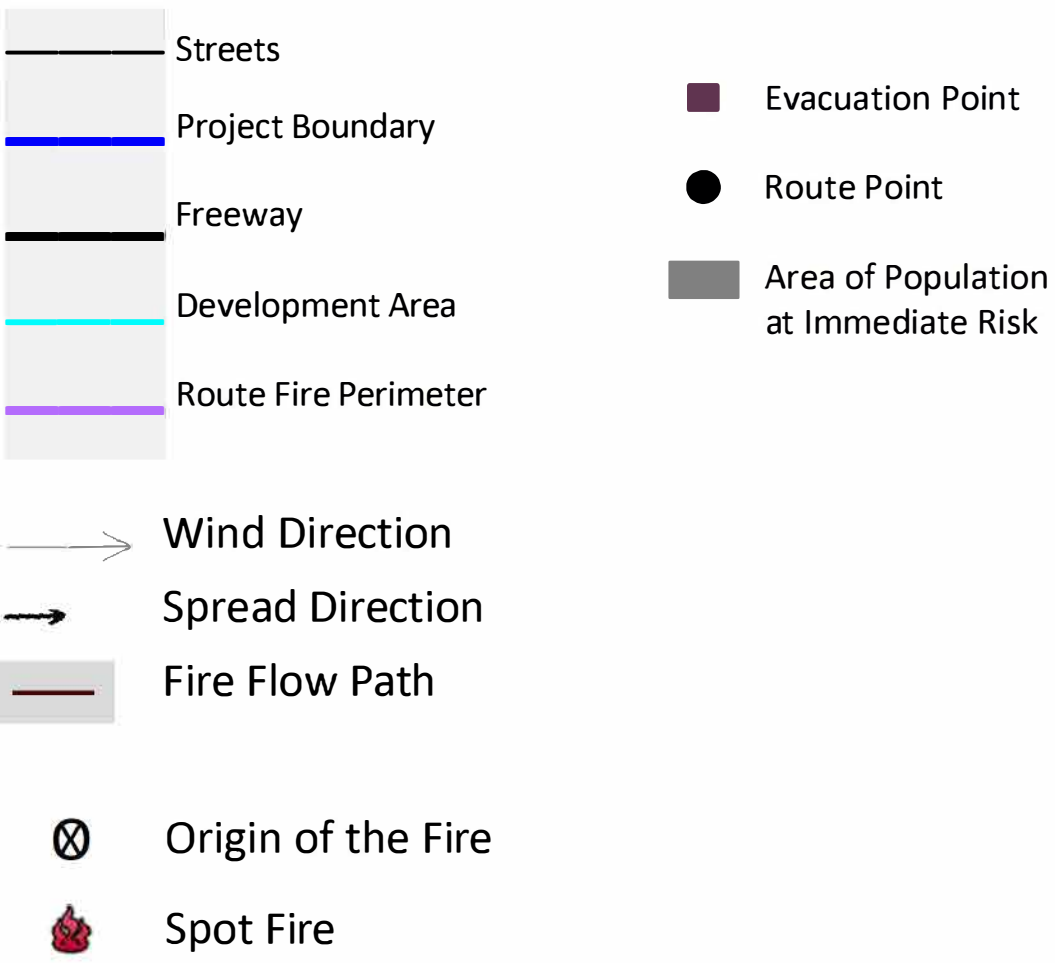




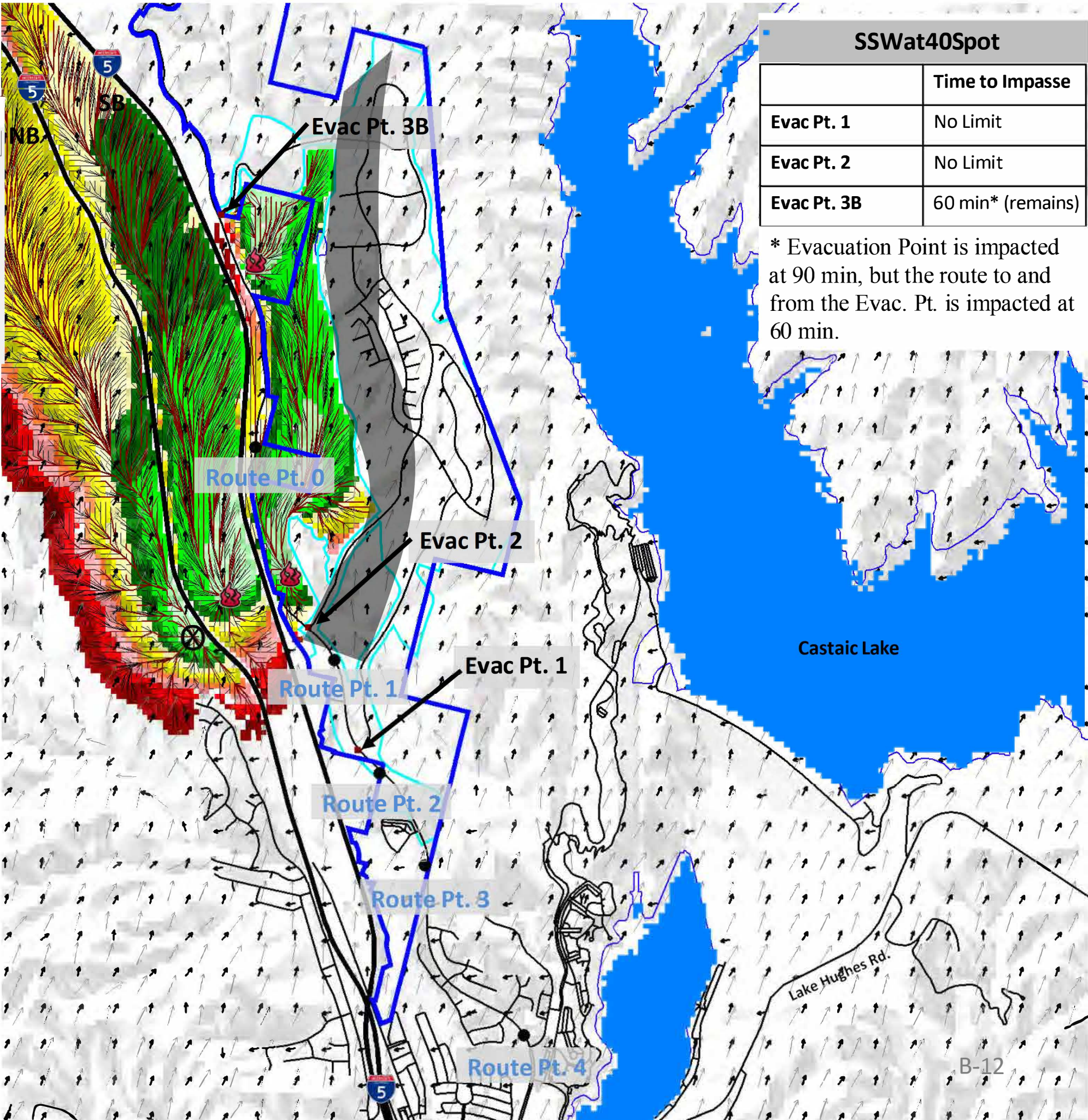
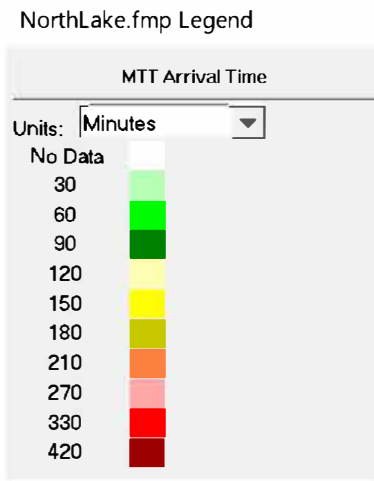
Increased Wind Speed (SSW direction)  
Creek Avoidance Development Added

This is the Route Fire with 40 mph winds (sustained). The fire was made to spot over the freeways and start again.

Development shown as modified wildland fuels due to fuel modification, plant pallet restriction and structure hardening



Origin to first spot 30 min.  
First spot to second spot 30 min.  
First spot to Third spot 60 min.  
**SSW wind at 40 Spot**

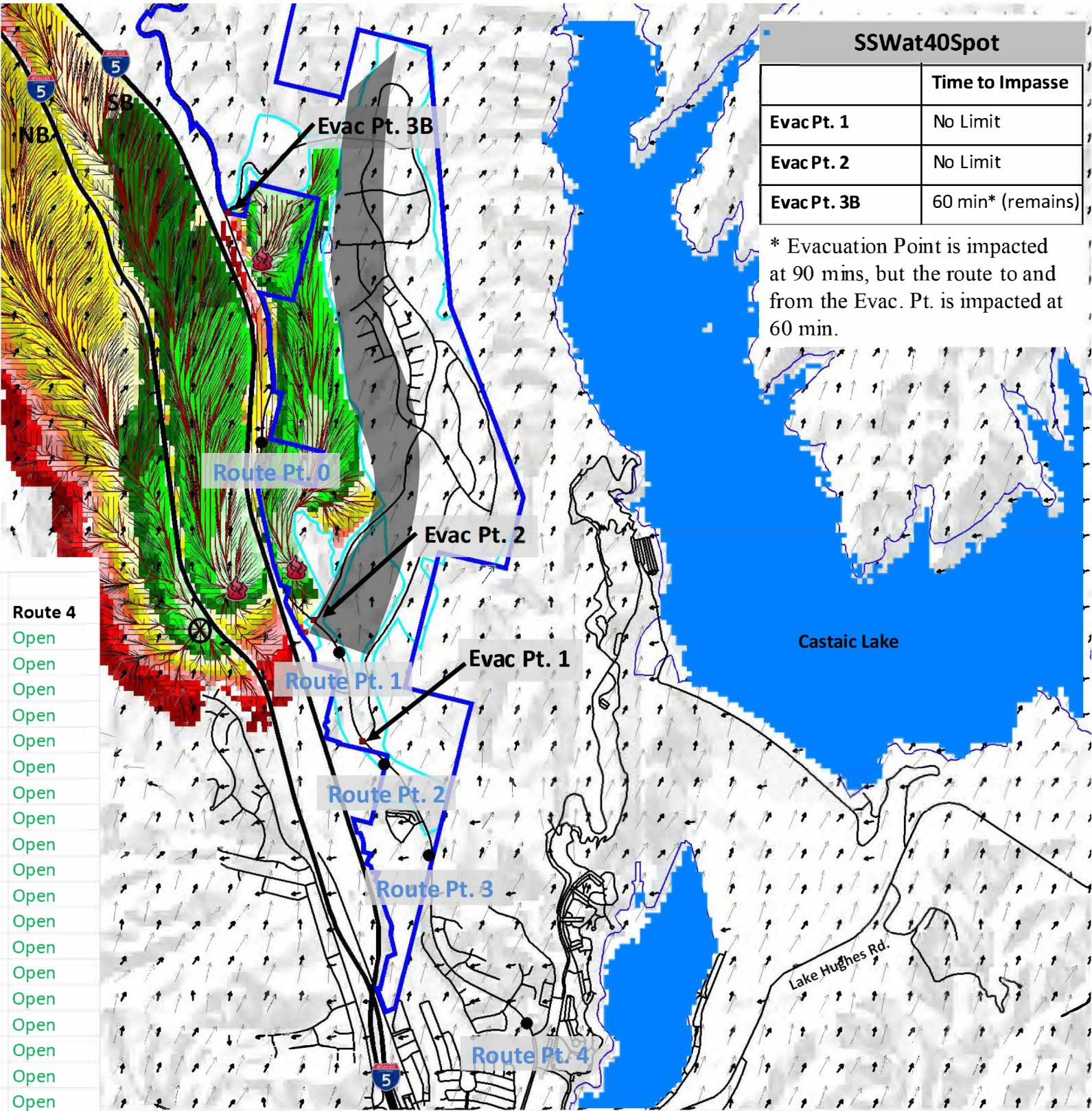




Increased Wind Speed (SSW direction)  
Creek Avoidance Development Added

Narrative: Fire begins as spot fires west of the northbound I-5 under a SSW Wind at 40 mph with the head fire moving to the northeast (branching to the north and south). At 30 min (elapsed time) fire spots over the NB I-5. The fire continues to burn NNE and spots over the SB I-5 impacting Ridge Route north of Evac Point 2 at 60 min (elapsed time). The fire spots over the SB I-5 south of Evac Point 3A at 90 min (elapsed time) continues to burn to the north to the north and south along the west side of the Project Site.

SSW Spot at 40 mph Avoid		Evacuation to the South									
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
30	0:30	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
45	0:45	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
60	1:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
75	1:15	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
90	1:30	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
105	1:45	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
120	2:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
135	2:15	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
150	2:30	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
165	2:45	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
180	3:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
195	3:15	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
210	3:30	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
225	3:45	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
240	4:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
255	4:15	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
270	4:30	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
285	4:45	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
300	5:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
315	5:15	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
330	5:30	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
345	5:45	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
360	6:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
375	6:15	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
390	6:30	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
405	6:45	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
420	7:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open

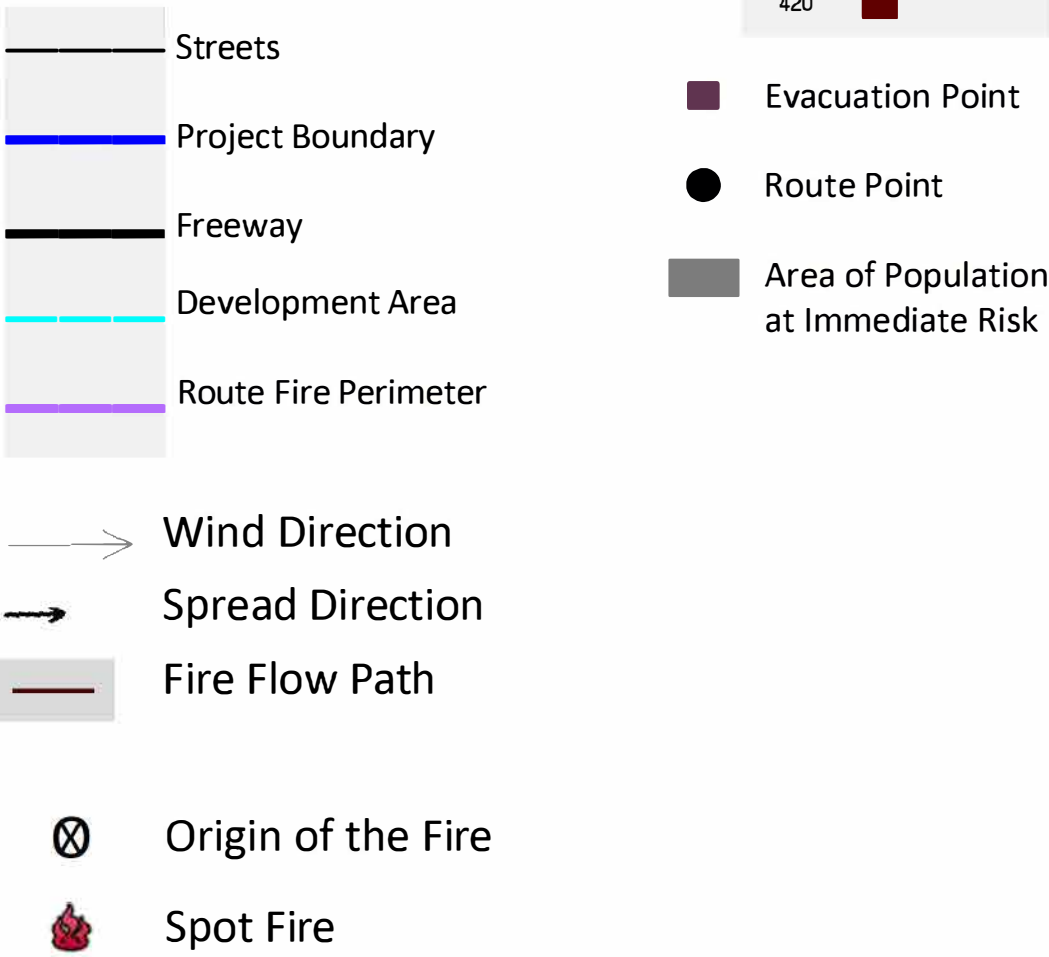




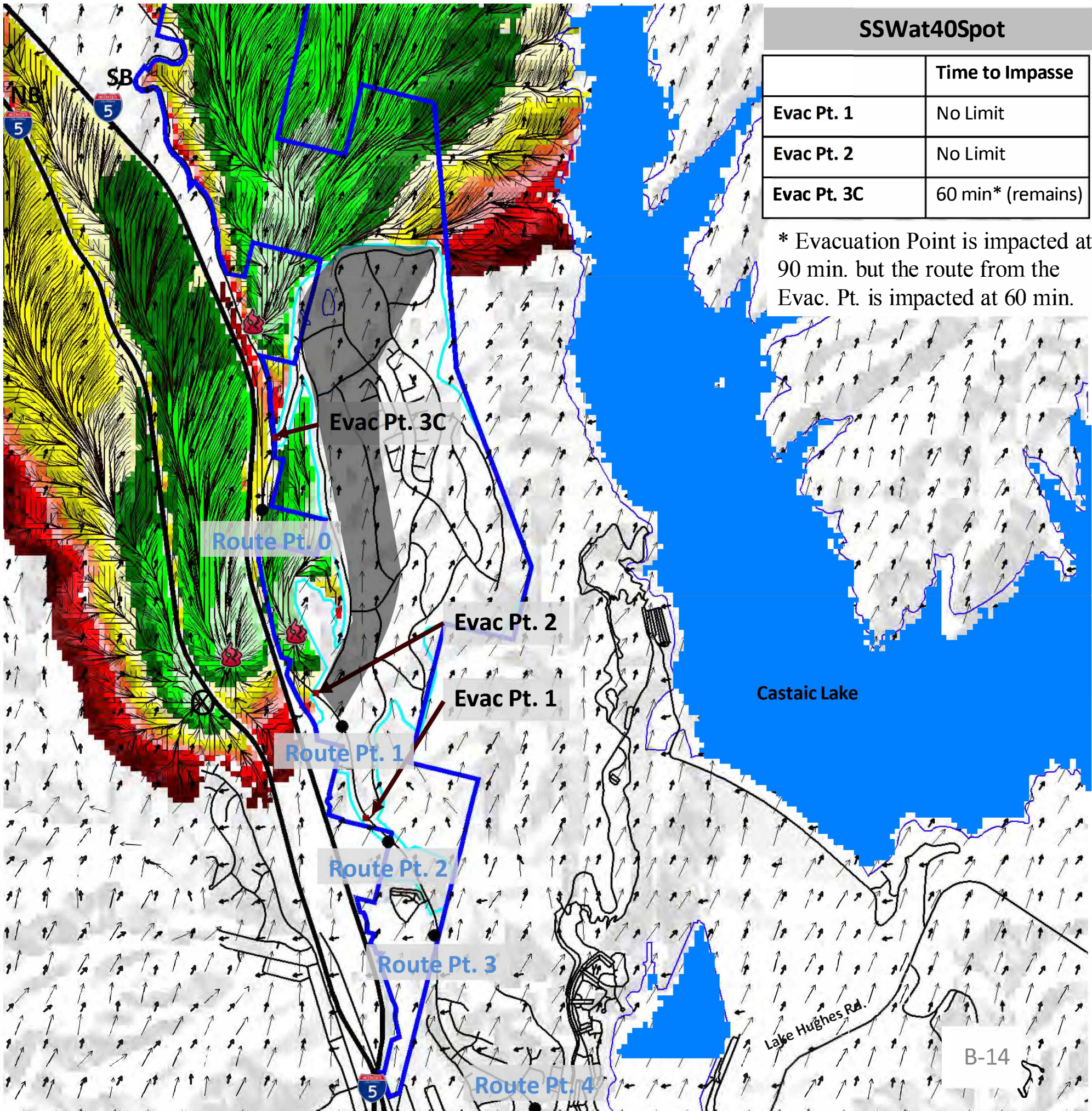
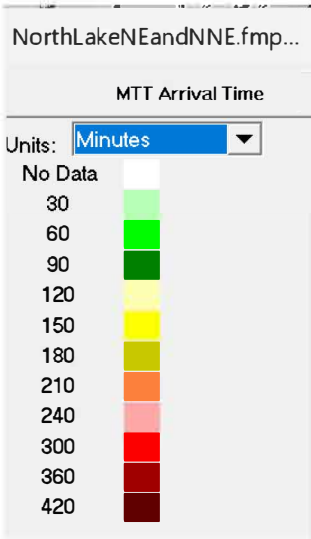
Increased Wind Speed (SSW direction)  
Partial Creek Avoidance Development Added

This is the Route Fire with 40 mph winds (sustained). The fire was made to spot over the freeways and start again.

Development shown as modified wildland fuels due to fuel modification, plant palletted restriction and structure hardening



Origin to first spot 30 min.  
First spot to second spot 30 min.  
Third spot 60 min.  
SSW wind at 40 Spot

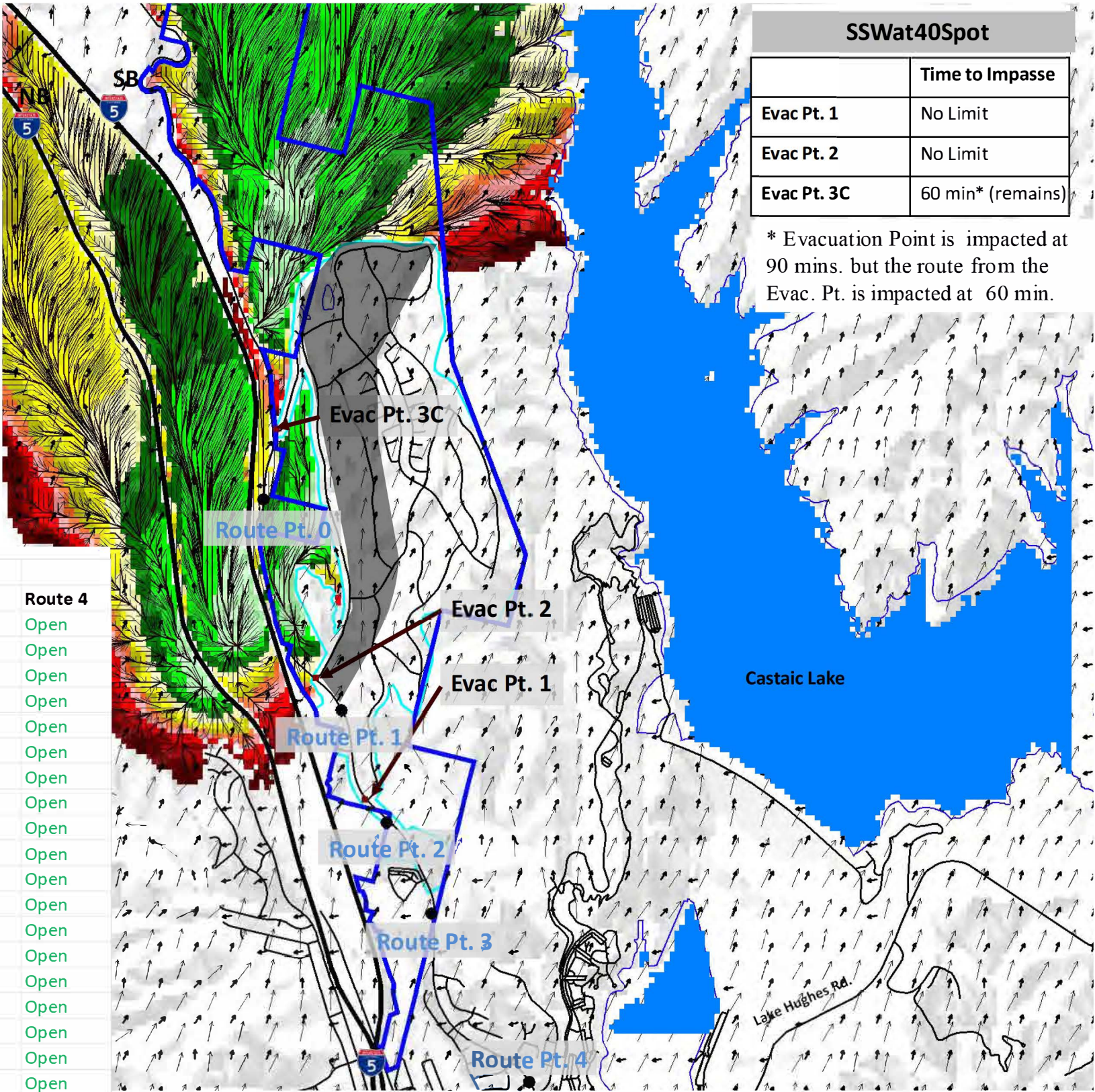




Increased Wind Speed (SSW direction)  
Partial Creek Avoidance Development Added

Narrative: Fire begins as spot fires west of the northbound I-5 under a SSW Wind at 40 mph with the head fire moving to the northeast (branching to the north and south). At 30 min (elapsed time) fire spots over the NB I-5. The fire continues to burn NNE and spots over the SB I-5 impacting Ridge Route north of Evac Point 2 at 60 min (elapsed time). The fire spots over the SB I-5 south of Evac Point 3A at 90 min (elapsed time) continues to burn to the north to the north and south along the west side of the Project Site.

SSW Spot at 40 mph Partial Avoid			Evacuation to the South							
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
30	0:30 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
45	0:45 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
60	1:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
75	1:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
90	1:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
105	1:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
120	2:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
135	2:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
150	2:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
165	2:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
180	3:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
195	3:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
210	3:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
225	3:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
240	4:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
255	4:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
270	4:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
285	4:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
300	5:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
315	5:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
330	5:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
345	5:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
360	6:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
375	6:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
390	6:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
405	6:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
420	7:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open

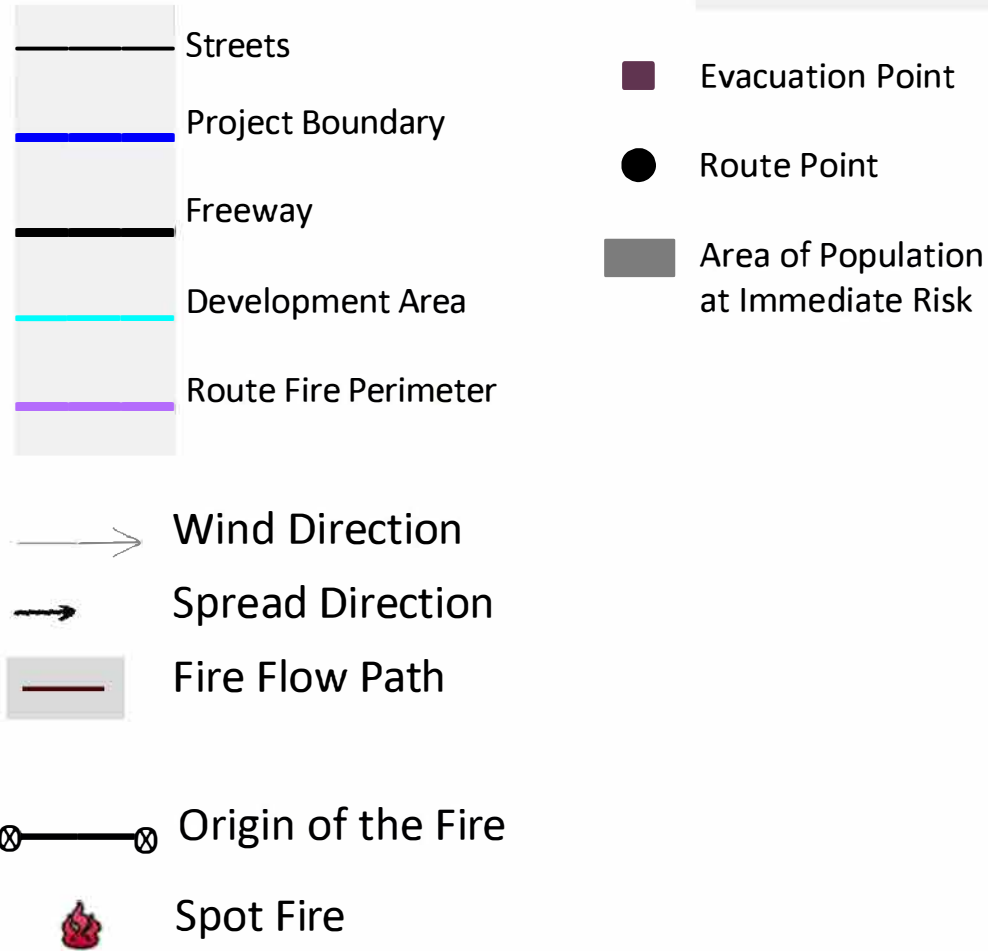




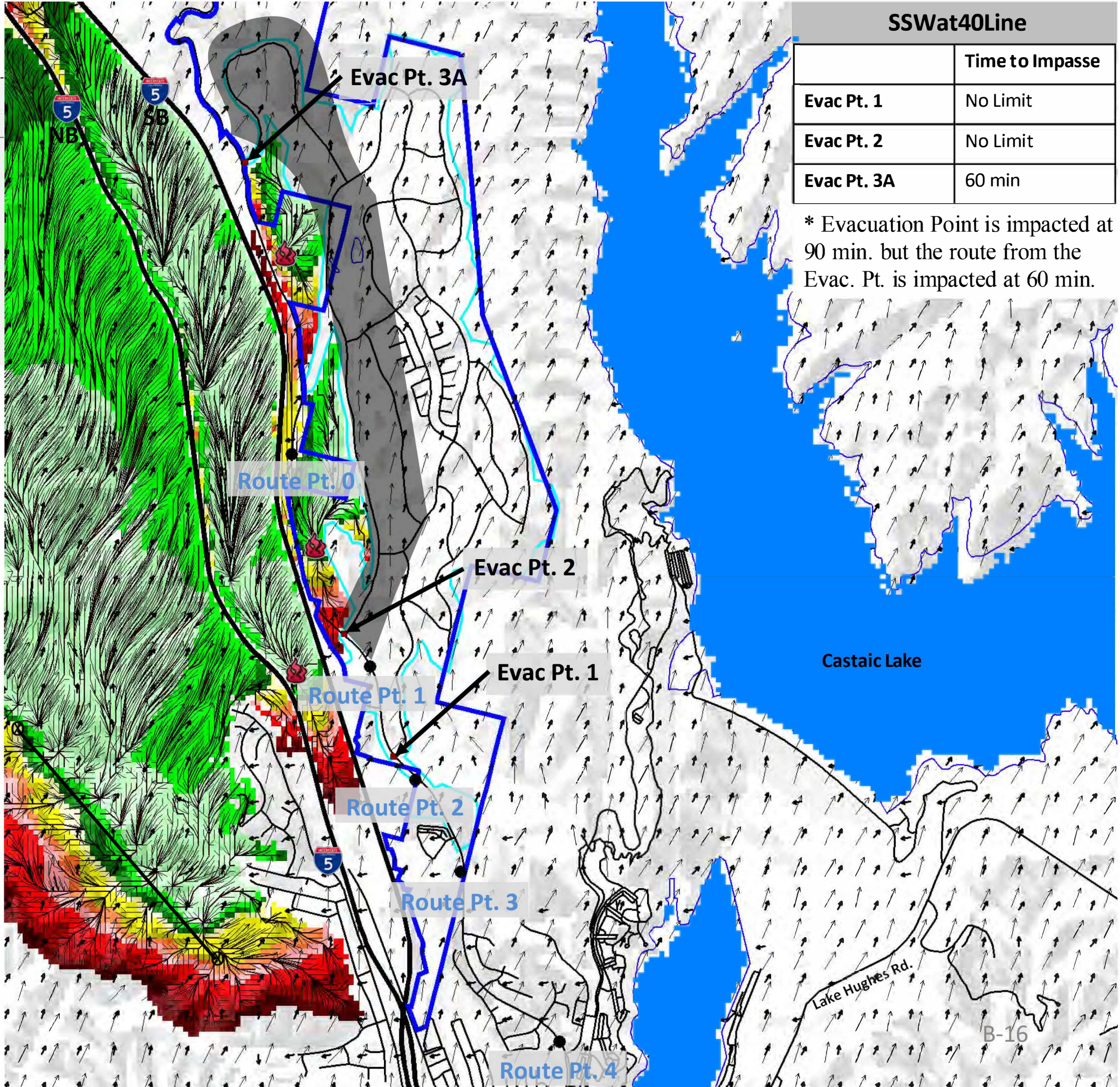
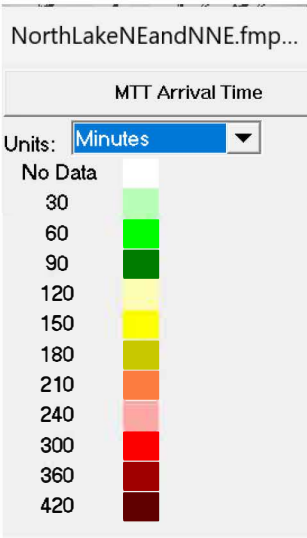
Increased Wind Speed (SSW direction) Line of Fire with Previously Approved Development

This fire with 40 mph winds (sustained) starts from an established line of fire to the SW.

The fire was made to spot over the freeways and start again.



Origin to first spot 30 min.  
First spot to second spot 30 min.  
Third spot 30 min.  
**SSW wind at 40 Line**



SSWat40Line	
	Time to Impasse
Evac Pt. 1	No Limit
Evac Pt. 2	No Limit
Evac Pt. 3A	60 min

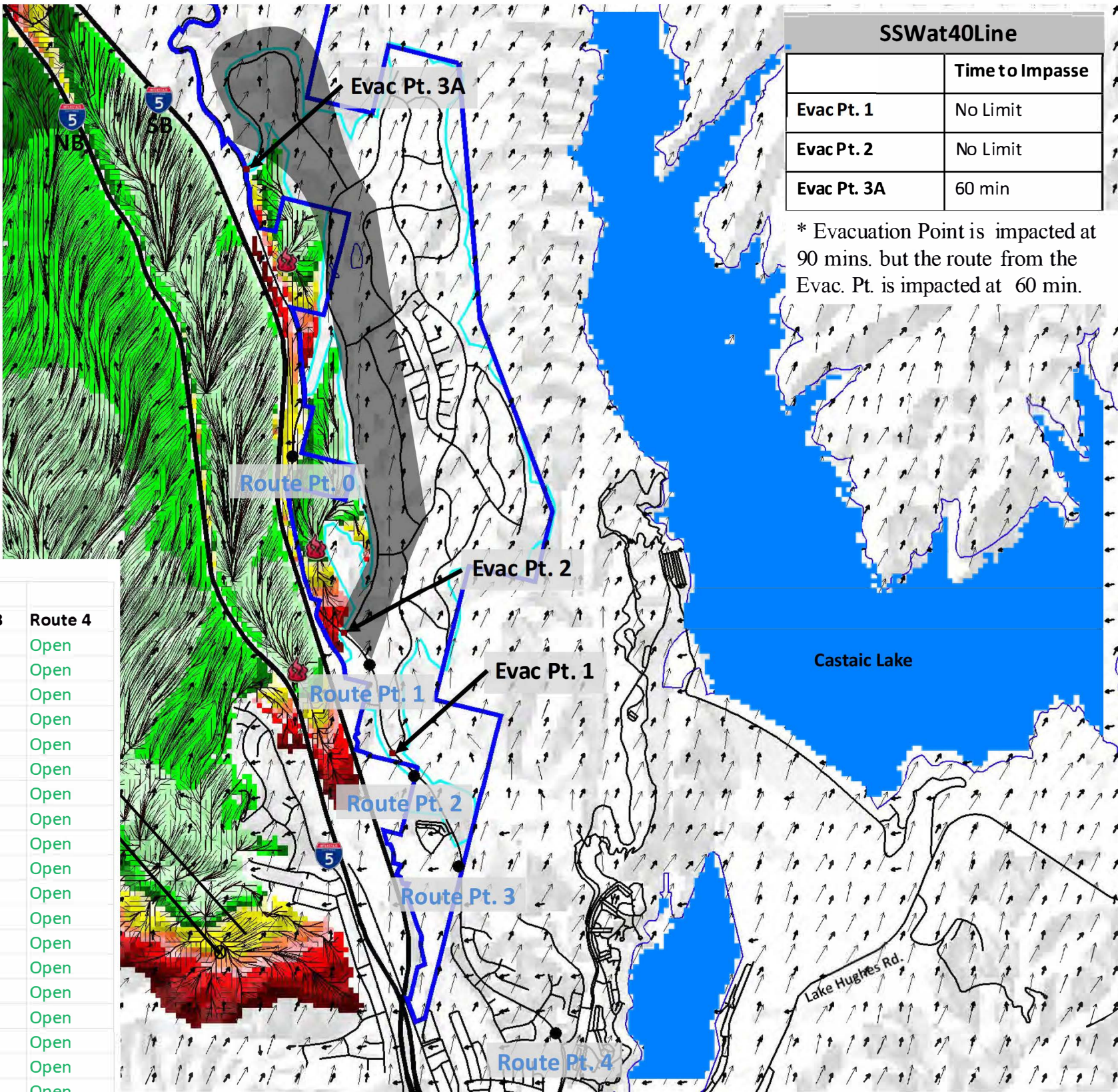
\* Evacuation Point is impacted at 90 min. but the route from the Evac. Pt. is impacted at 60 min.



Increased Wind Speed (SSW direction) Line of Fire with Previously Approved Development

Narrative: Fire as a line of fire west of the northbound I-5 under a SSW Wind at 40 mph with the head fire moving to the northeast (branching to the north and south). At 30 min (elapsed time) fire spots over the NB I-5. The fire continues to burn NNE and spots over the SB I-5 impacting Ridge Route north of Evac Point 2 at 60 min (elapsed time). The fire spots over the SB I-5 south of Evac Point 3A at 90 min (elapsed time) continues to burn to the north to the north and south along the west side of the Project Site.

SSW Line at 40 mph Approved		Evacuation to the South									
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4	
15	0:15	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
30	0:30	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
45	0:45	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
60	1:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
75	1:15	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
90	1:30	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
105	1:45	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
120	2:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
135	2:15	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
150	2:30	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
165	2:45	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
180	3:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
195	3:15	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
210	3:30	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
225	3:45	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
240	4:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
255	4:15	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
270	4:30	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
285	4:45	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
300	5:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
315	5:15	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
330	5:30	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
345	5:45	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
360	6:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
375	6:15	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
390	6:30	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
405	6:45	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open
420	7:00	Open	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open

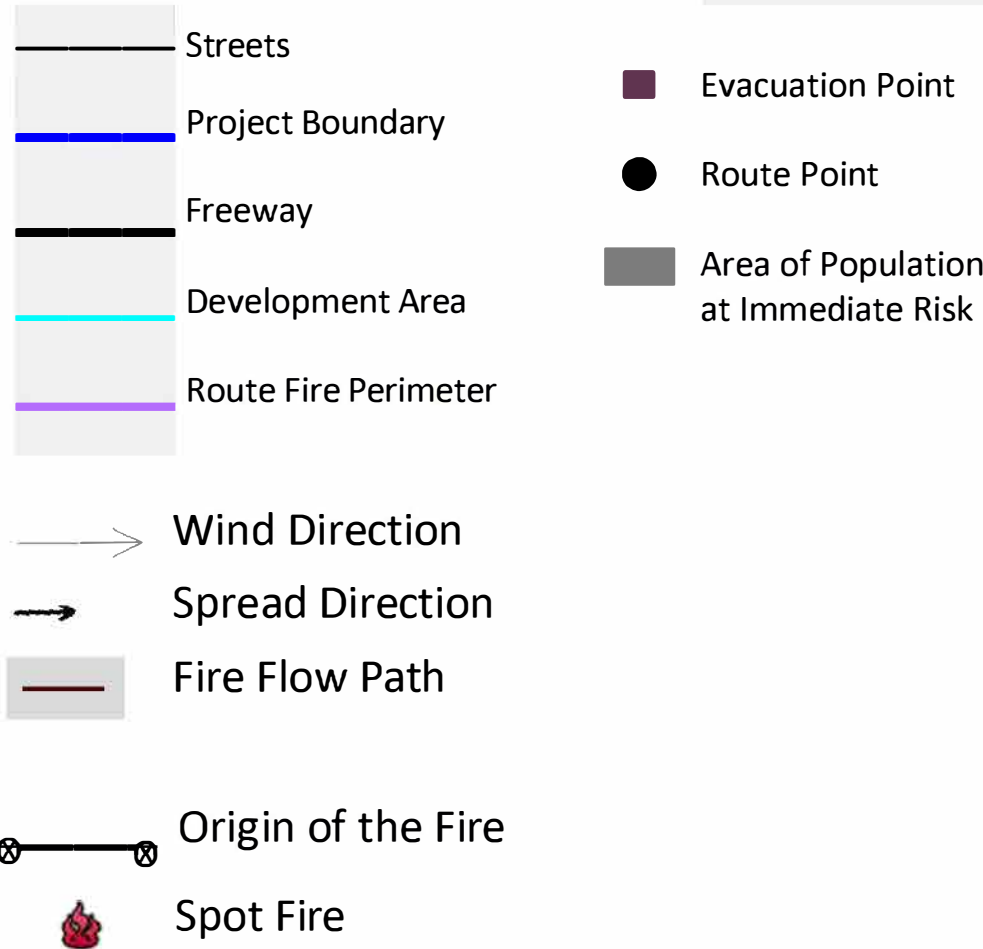




Increased Wind Speed (SSW direction)  
Line of Fire with Creek Avoidance Development

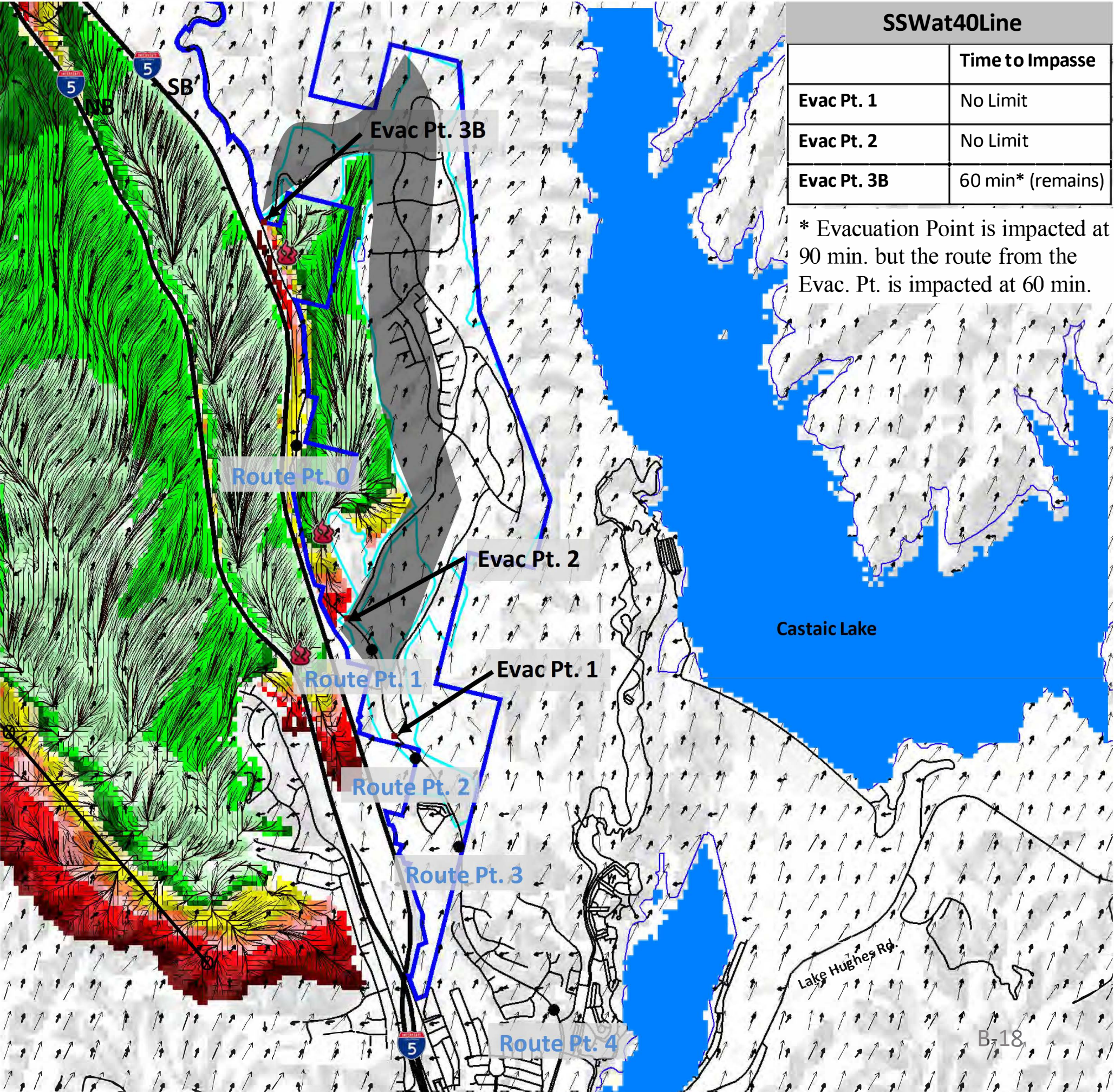
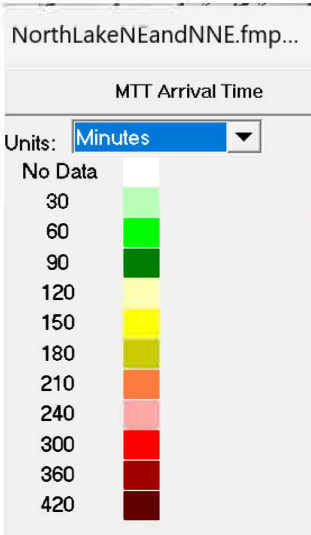
This fire with 40 mph winds (sustained) starts from an established line of fire to the SW.

The fire was made to spot over the freeways and start again.



Origin to first spot 30 min.  
First spot to second spot 30 min.  
Third spot 30 min.

SSW wind at 40 Line



SSWat40Line	
	Time to Impasse
Evac Pt. 1	No Limit
Evac Pt. 2	No Limit
Evac Pt. 3B	60 min* (remains)

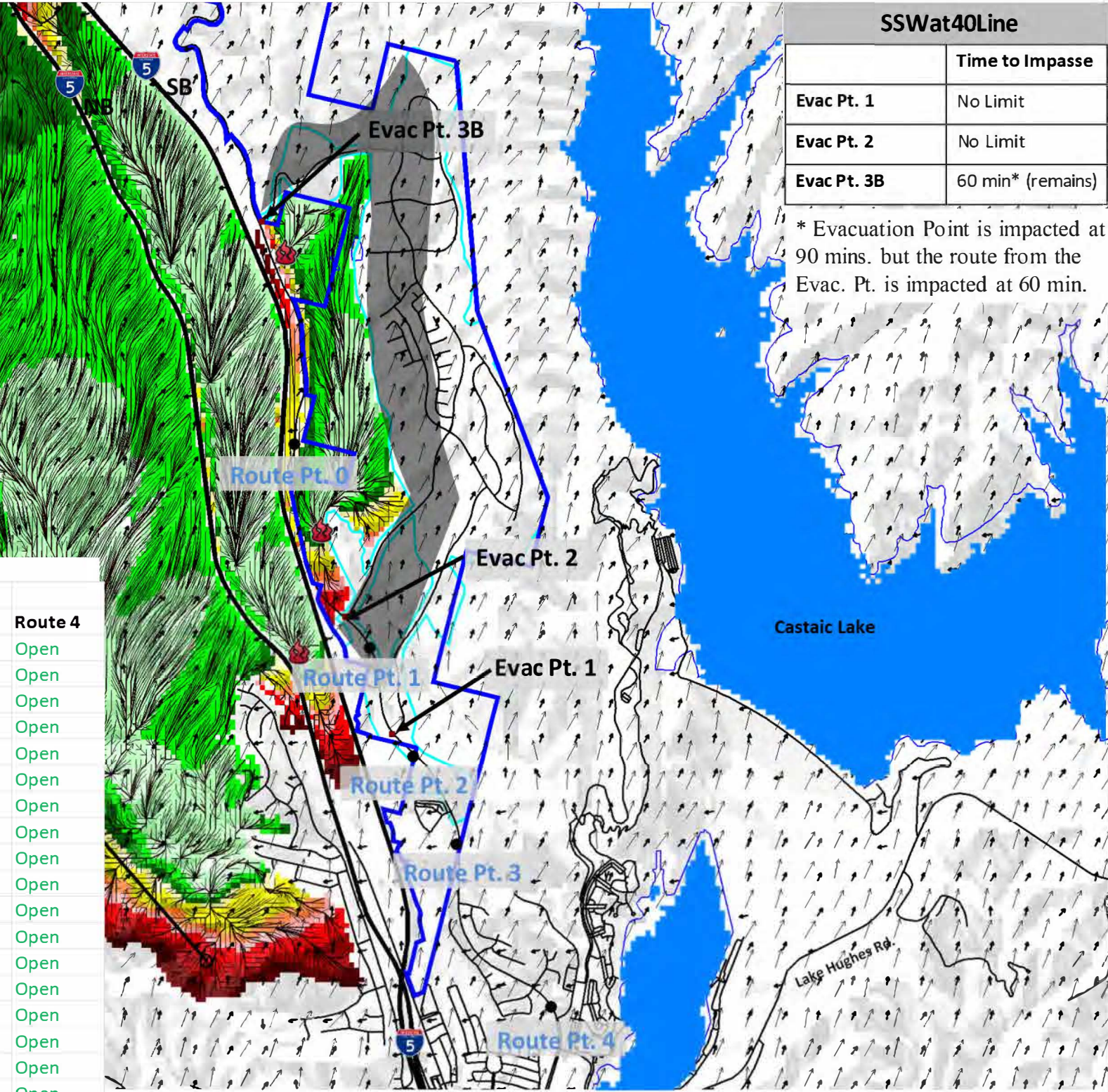
\* Evacuation Point is impacted at 90 min. but the route from the Evac. Pt. is impacted at 60 min.



Increased Wind Speed (SSW direction)  
Line of Fire with Creek Avoidance Development

Narrative: Fire as a line of fire west of the northbound I-5 under a SSW Wind at 40 mph with the head fire moving to the northeast (branching to the north and south). At 30 min (elapsed time) fire spots over the NB I-5. The fire continues to burn NNE and spots over the SB I-5 impacting Ridge Route north of Evac Point 2 at 60 min (elapsed time). The fire spots over the SB I-5 south of Evac Point 3A at 90 min (elapsed time) continues to burn to the north to the north and south along the west side of the Project Site.

SSW Line at 40 mph Avoid		Evacuation to the South									
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4	
15	0:15 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open	
30	0:30 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open	
45	0:45 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open	
60	1:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
75	1:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
90	1:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
105	1:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
120	2:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
135	2:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
150	2:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
165	2:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
180	3:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
195	3:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
210	3:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
225	3:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
240	4:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
255	4:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
270	4:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
285	4:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
300	5:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
315	5:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
330	5:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
345	5:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
360	6:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
375	6:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
390	6:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
405	6:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	
420	7:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open	



SSWat40Line	
	Time to Impasse
Evac Pt. 1	No Limit
Evac Pt. 2	No Limit
Evac Pt. 3B	60 min* (remains)

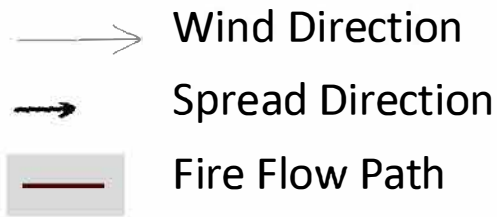
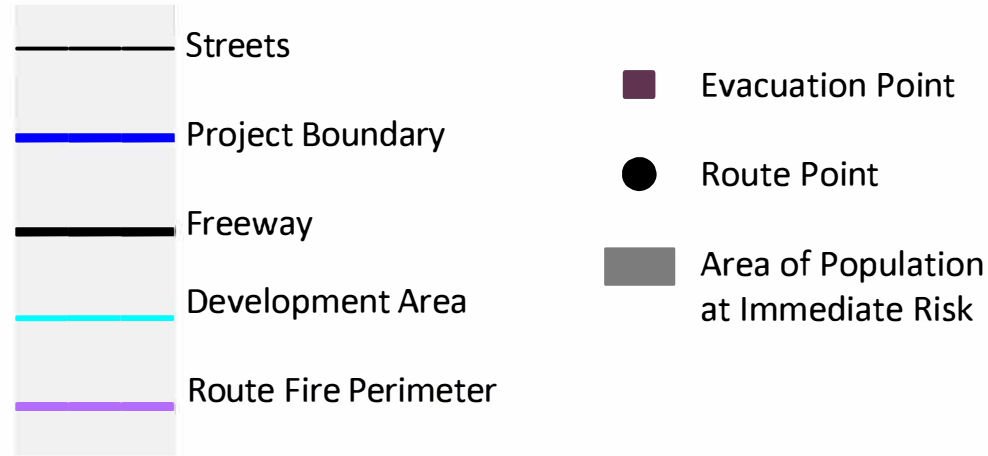
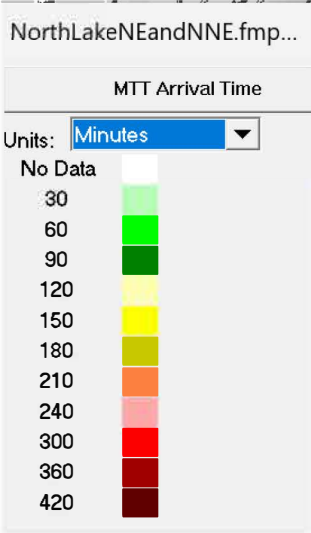
\* Evacuation Point is impacted at 90 mins. but the route from the Evac. Pt. is impacted at 60 min.



Increased Wind Speed (SSW direction)  
Line of Fire with Partial Creek Avoidance Development

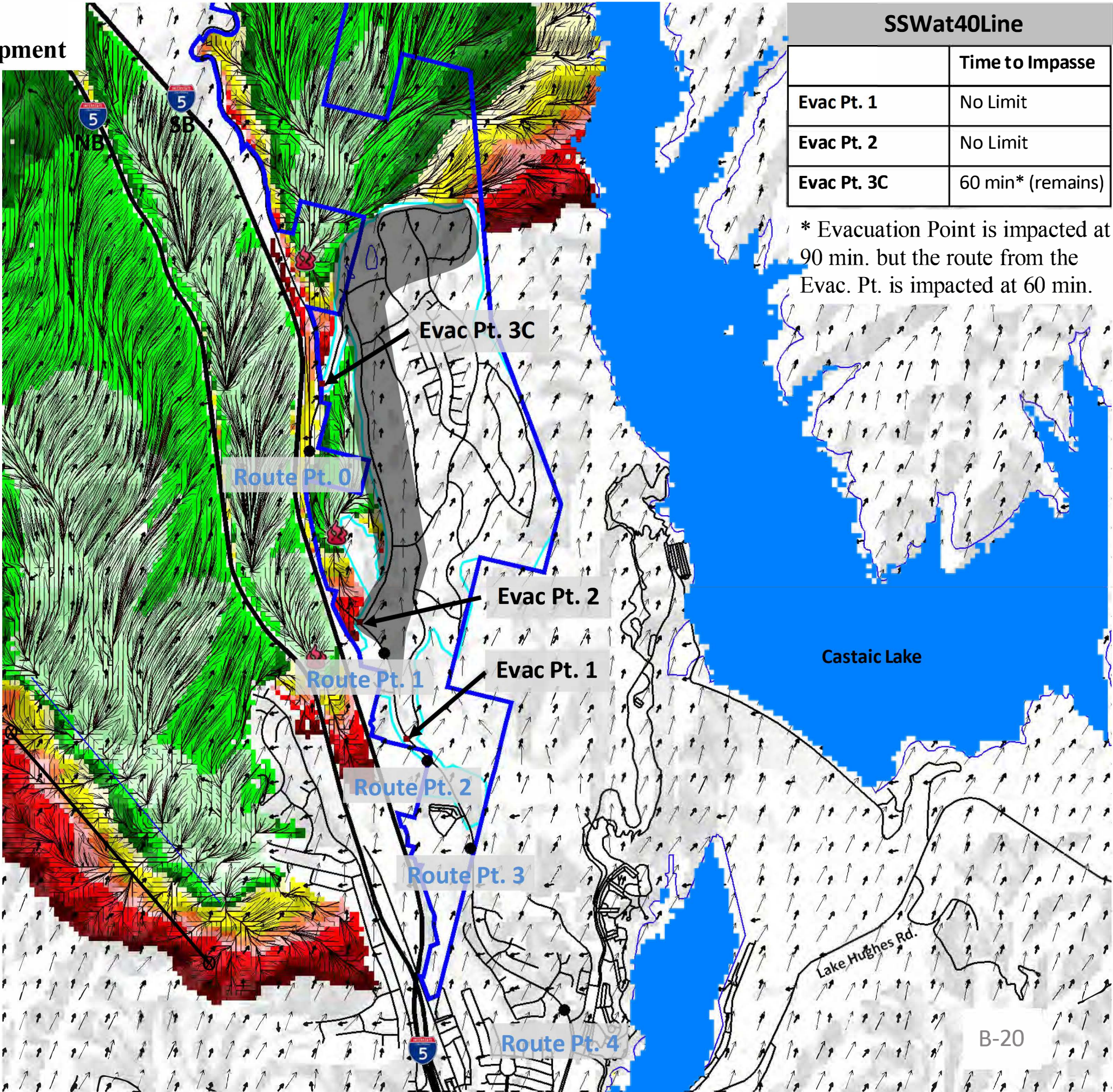
This fire with 40 mph winds (sustained) starts from an established line of fire to the SW.

The fire was made to spot over the freeways and start again.



Origin to first spot 30 min.  
First spot to second spot 30 min.  
Third spot 30 min.

SSW wind at 40 Line

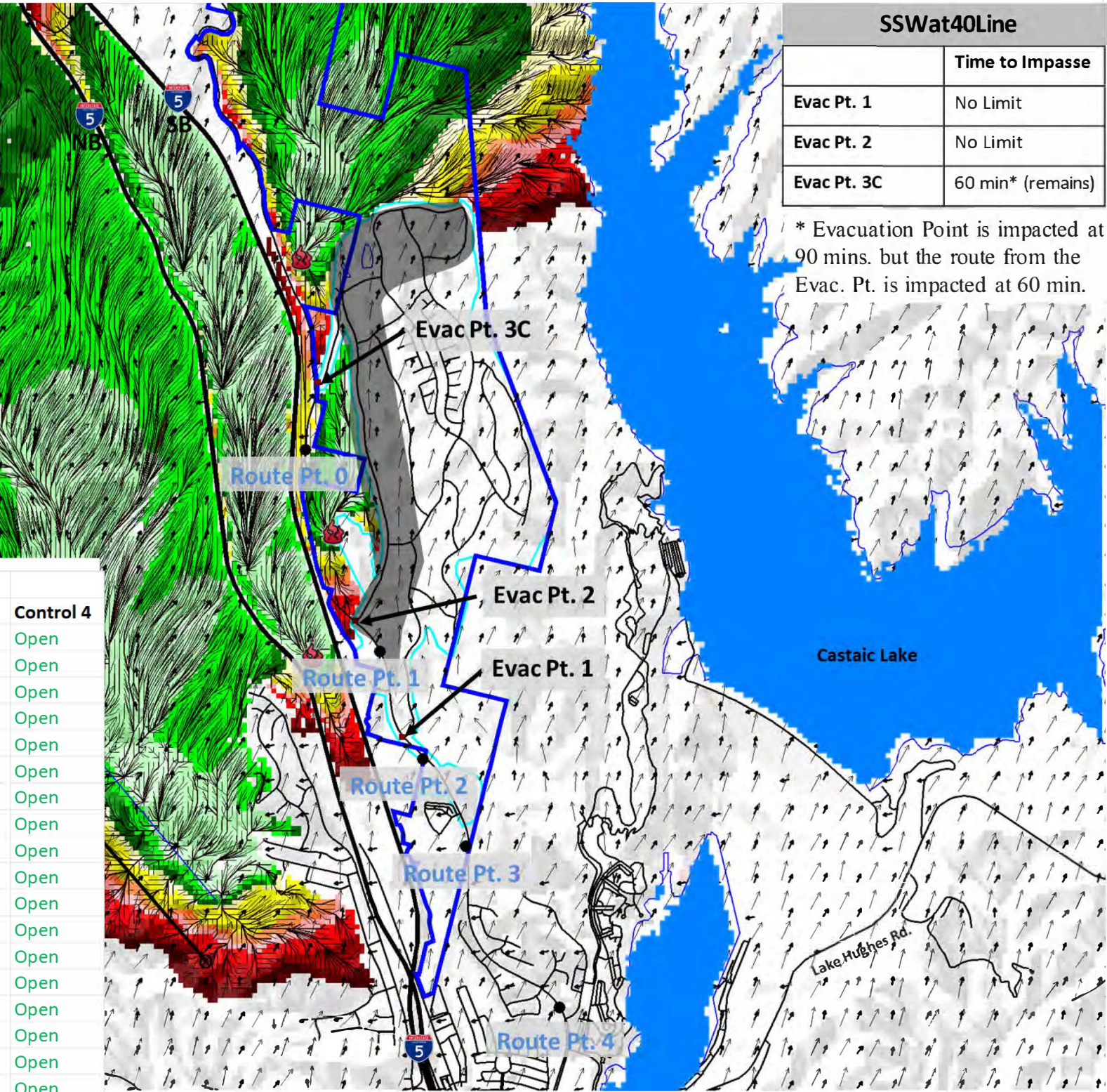




Increased Wind Speed (SSW direction)  
Line of Fire with Partial Creek Avoidance Development

Narrative: Fire as a line of fire west of the northbound I-5 under a SSW Wind at 40 mph with the head fire moving to the northeast (branching to the north and south). At 30 min (elapsed time) fire spots over the NB I-5. The fire continues to burn NNE and spots over the SB I-5 impacting Ridge Route north of Evac Point 2 at 60 min (elapsed time). The fire spots over the SB I-5 south of Evac Point 3A at 90 min (elapsed time) continues to burn to the north to the north and south along the west side and moves to the east at the top of the Project Site.

SSW Line at 40 mph Partial Avoid		Evacuation to the South									
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Control 0	Control 1	Control 2	Control 3	Control 4
15	0:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
30	0:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
45	0:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
60	1:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
75	1:15	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
90	1:30	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
105	1:45	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
120	2:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
135	2:15	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
150	2:30	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
165	2:45	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
180	3:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
195	3:15	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
210	3:30	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
225	3:45	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
240	4:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
255	4:15	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
270	4:30	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
285	4:45	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
300	5:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
315	5:15	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
330	5:30	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
345	5:45	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
360	6:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
375	6:15	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
390	6:30	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
405	6:45	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
420	7:00	Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open

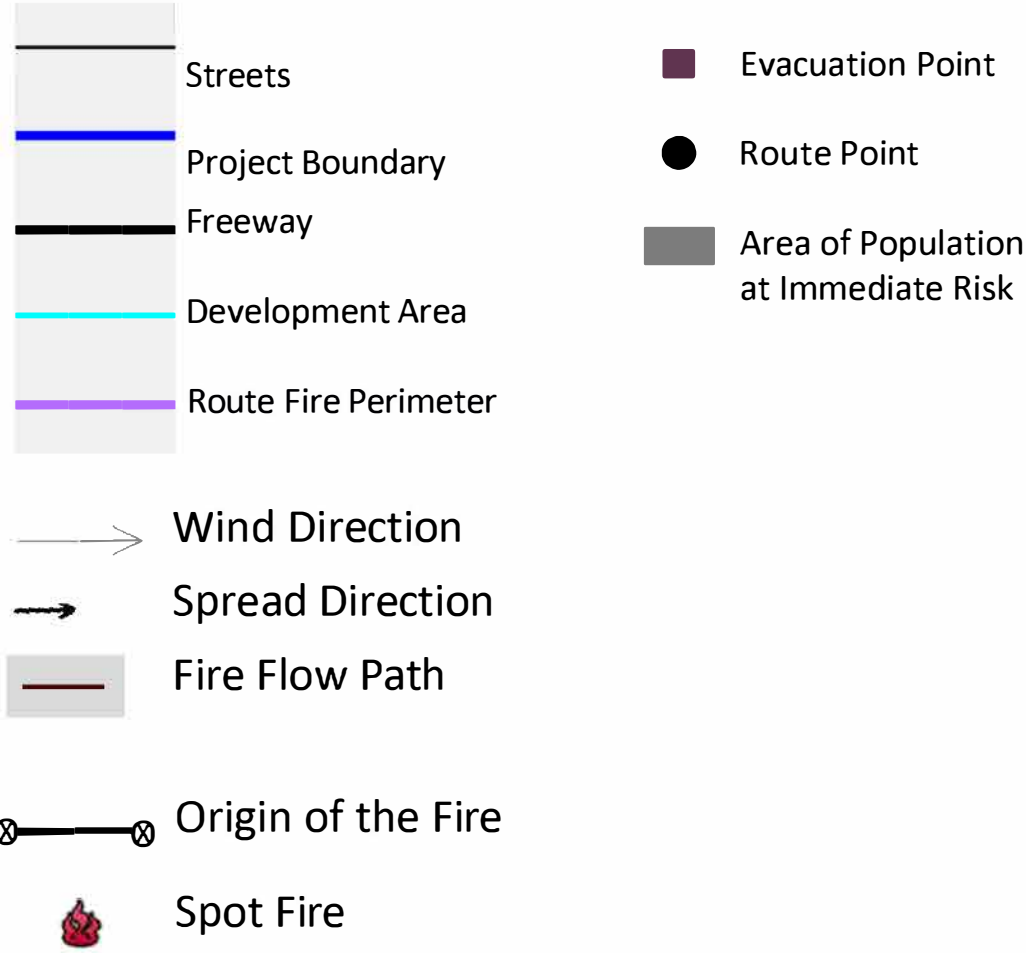
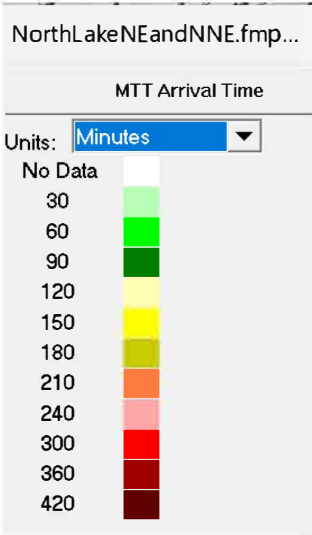




Wind Speed 40 mph (S direction) with Previously Approved Development

This fire with 40 mph winds (sustained) starts from a larger established line of fire to the South.

The fire was not made to spot over the freeways and start again as the wind direction will not take the fire in the direction of the development.



Wind Direction

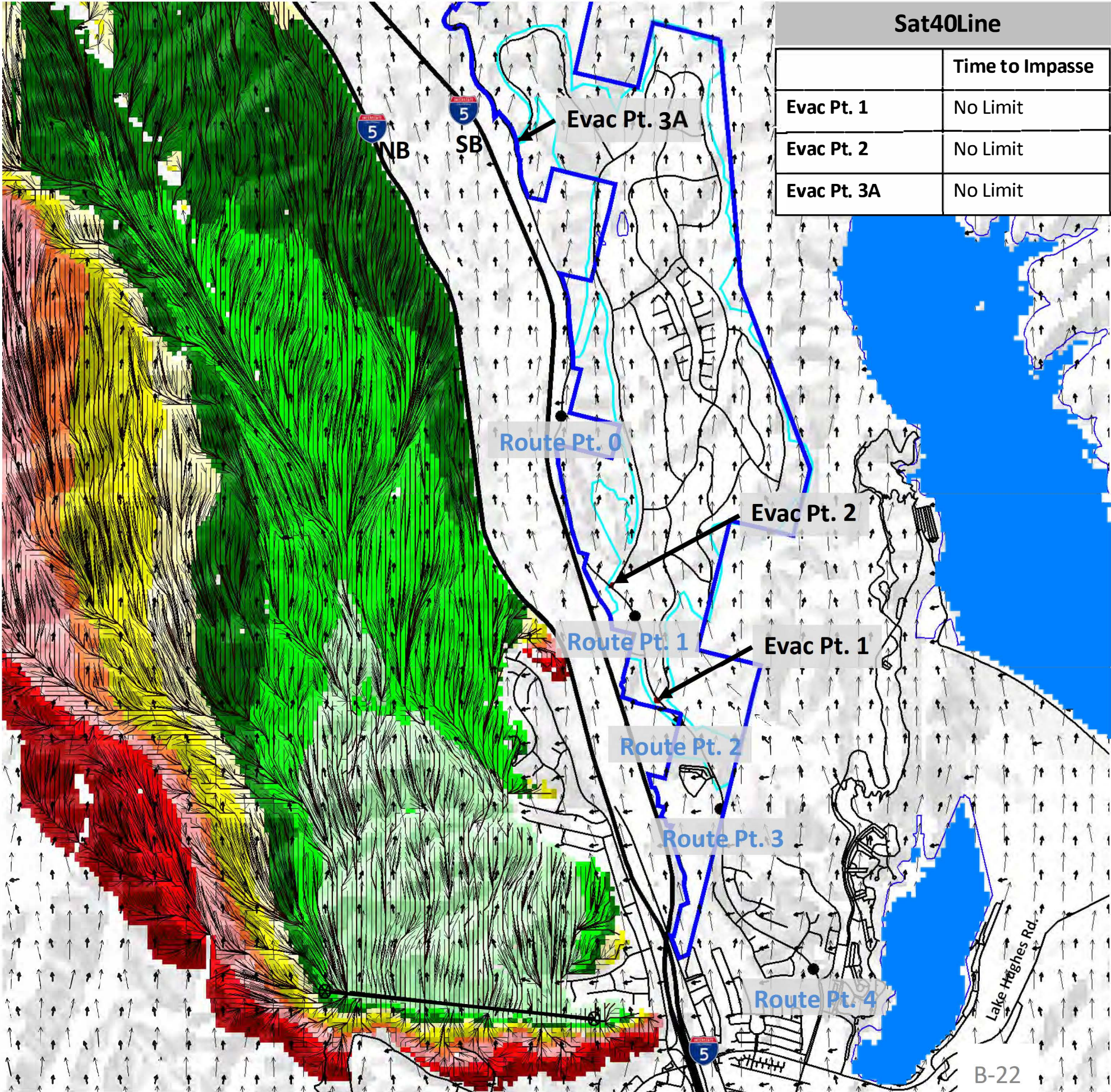
Spread Direction

Fire Flow Path

Origin of the Fire

Spot Fire

S wind at 40 Line

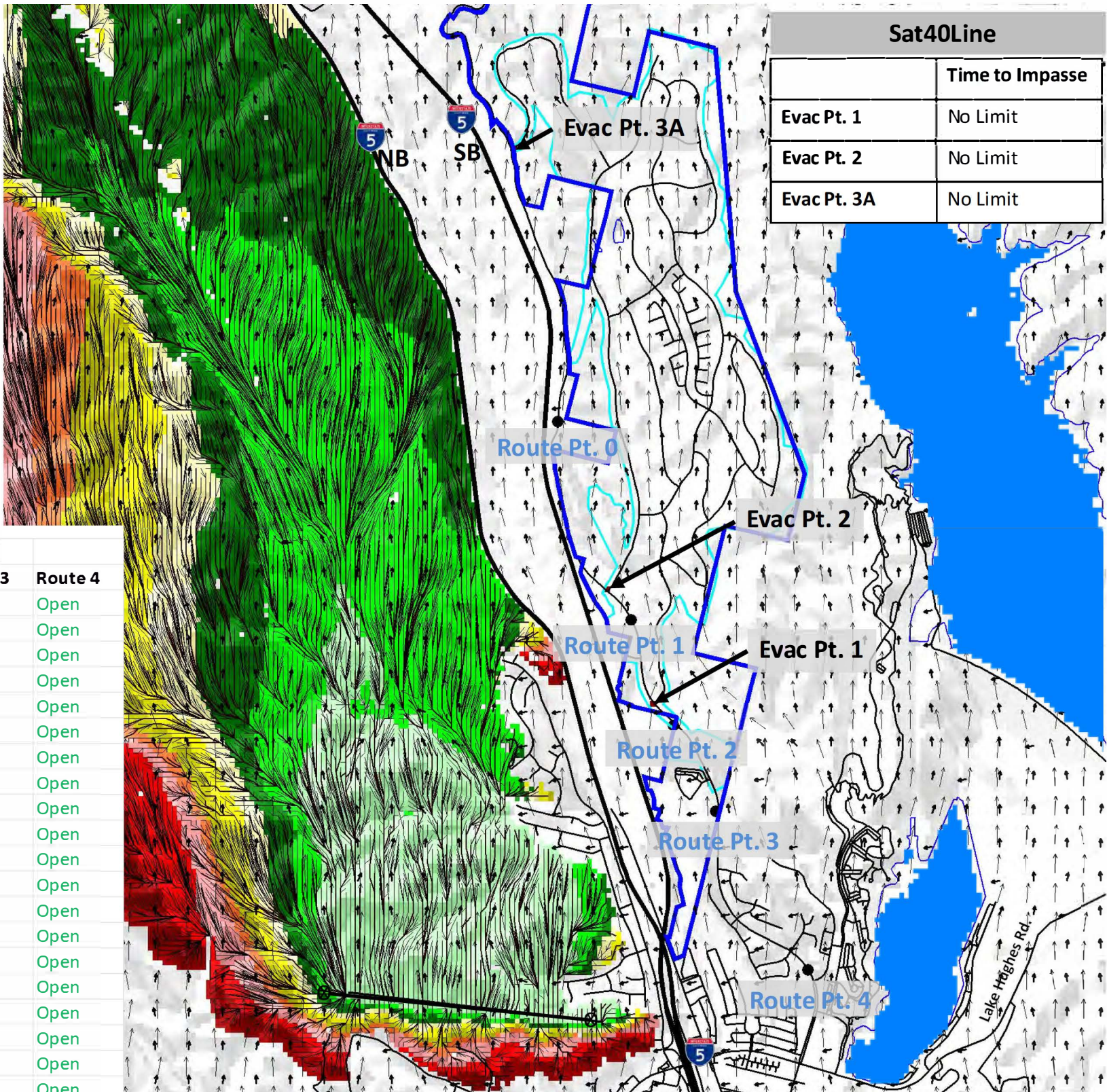




Wind Speed 40 mph (S direction) with  
Previously Approved Development

Narrative: Fire as a line of fire west of the northbound I-5 under a South Wind at 40 mph with the head fire moving to the north (branching to the west but holding at the freeway on the east). The wind direction and location of the fire does not have a high probability of spotting over the freeway in the vicinity of the Project Site. The program did not provide spots and they were not added manually.

South Line at 40 mph Approved		Evacuation to the South								
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
30	0:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
45	0:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
60	1:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
75	1:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
90	1:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
105	1:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
120	2:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
135	2:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
150	2:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
165	2:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
180	3:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
195	3:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
210	3:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
225	3:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
240	4:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
255	4:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
270	4:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
285	4:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
300	5:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
315	5:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
330	5:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
345	5:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
360	6:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
375	6:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
390	6:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
405	6:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
420	7:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open

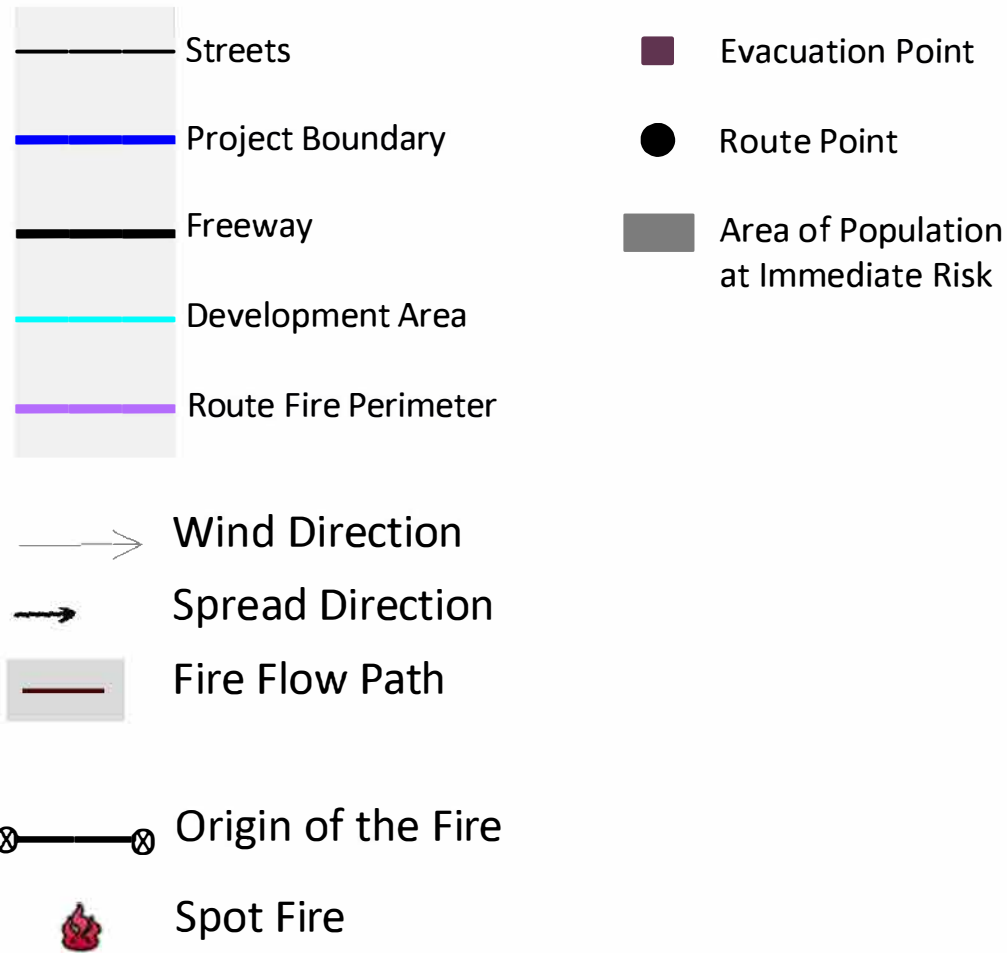
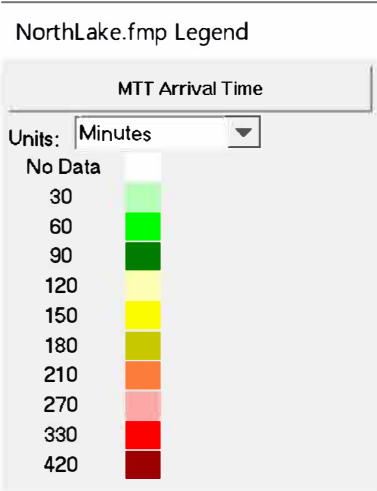




Wind Speed 40 mph (S direction)  
with Creek Avoidance Development

This fire with 40 mph winds  
(sustained) starts from a larger  
established line of fire to the South.

The fire was not made to spot over  
the freeways and start again as the  
wind direction will not take the fire  
in the direction of the development.



Wind Direction

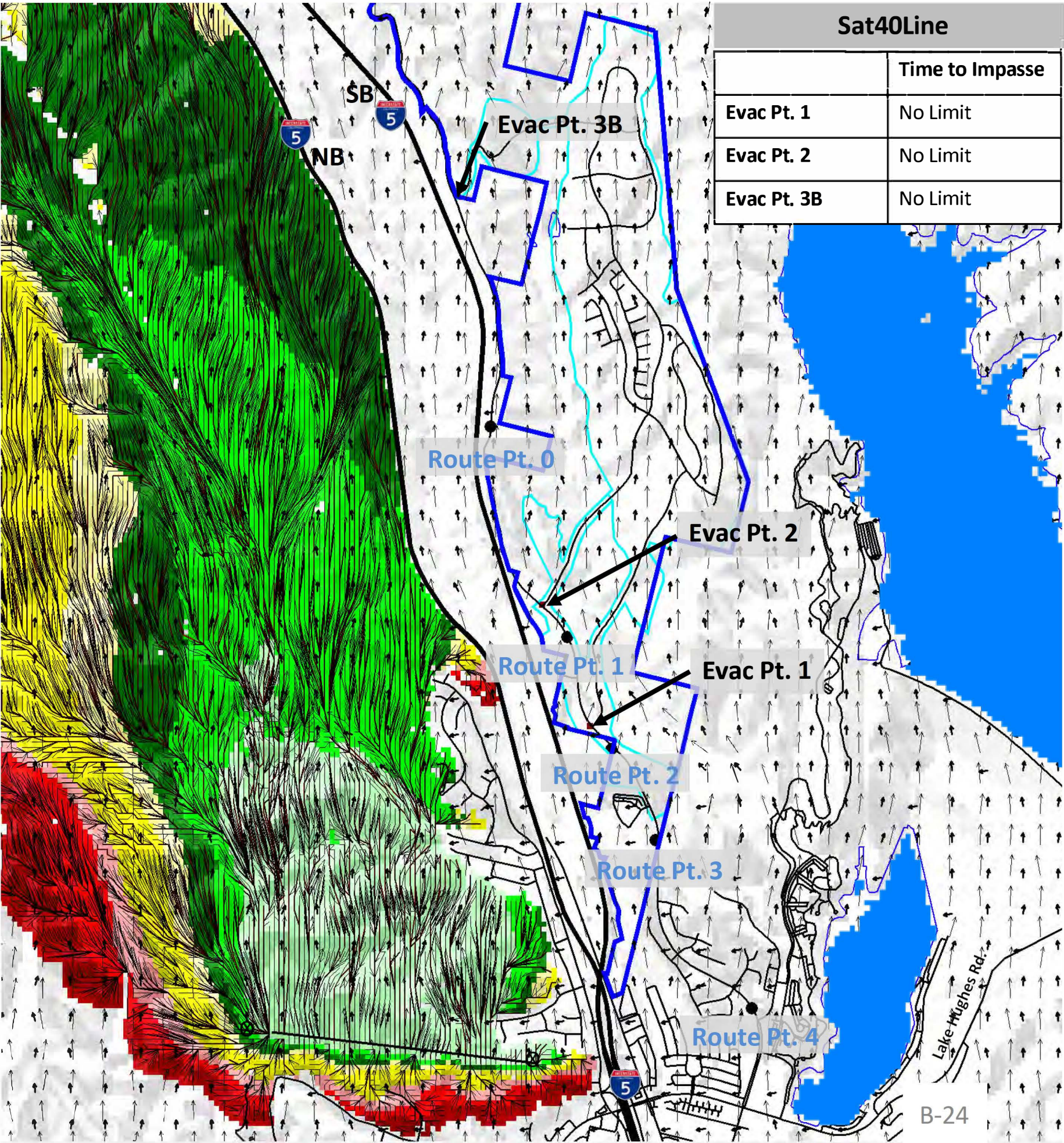
Spread Direction

Fire Flow Path

Origin of the Fire

Spot Fire

S wind at 40 Line

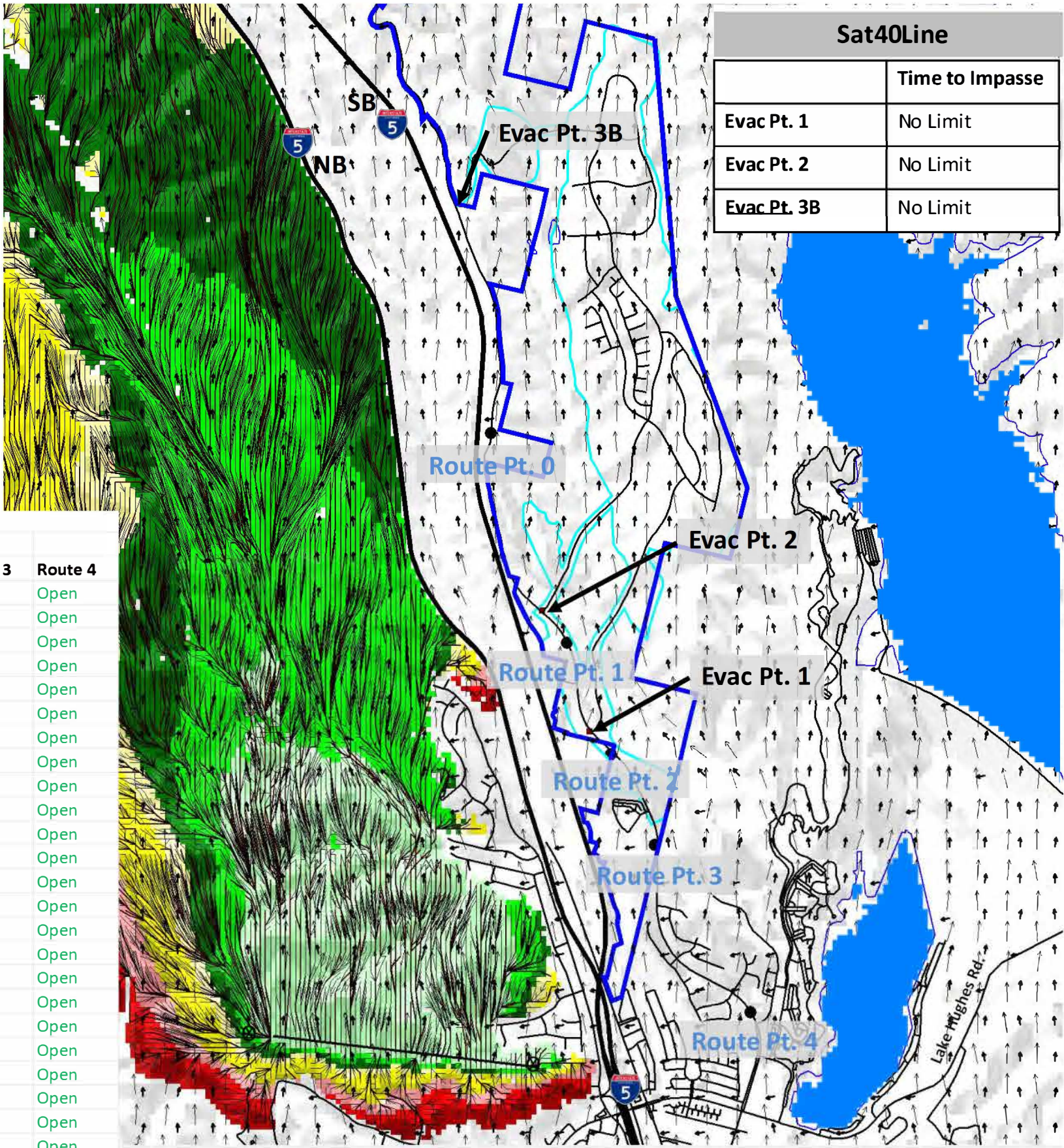




Wind Speed 40 mph (S direction) with  
Creek Avoidance Development

Narrative: Fire as a line of fire west of the northbound I-5 under a South Wind at 40 mph with the head fire moving to the north (branching to the west but holding at the freeway on the east). The wind direction and location of the fire does not have a high probability of spotting over the freeway in the vicinity of the Project Site. The program did not provide spots and they were not added manually.

South Line at 40 mph Avoid		Evacuation to the South					Route 0	Route 1	Route 2	Route 3	Route 4
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C					
15	0:15	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
30	0:30	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
45	0:45	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
60	1:00	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
75	1:15	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
90	1:30	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
105	1:45	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
120	2:00	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
135	2:15	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
150	2:30	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
165	2:45	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
180	3:00	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
195	3:15	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
210	3:30	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
225	3:45	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
240	4:00	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
255	4:15	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
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285	4:45	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
300	5:00	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
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345	5:45	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
360	6:00	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
375	6:15	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
390	6:30	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
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420	7:00	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open

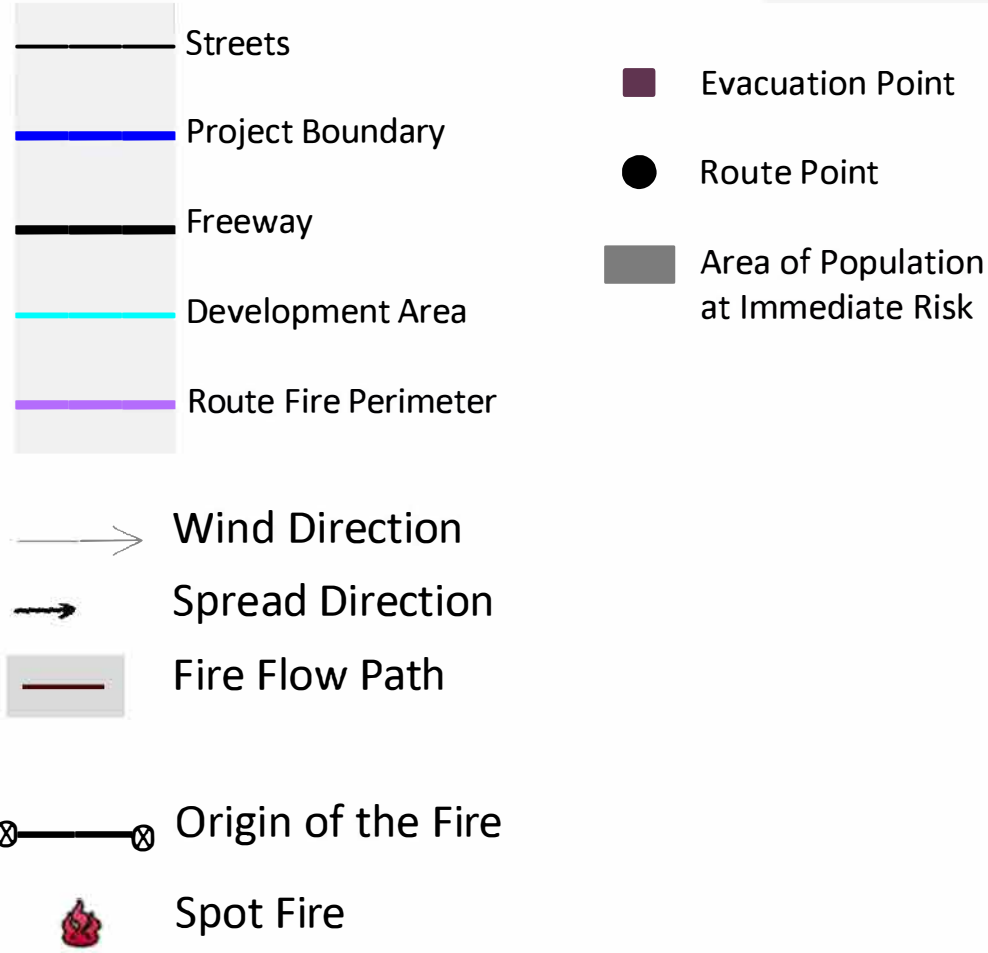
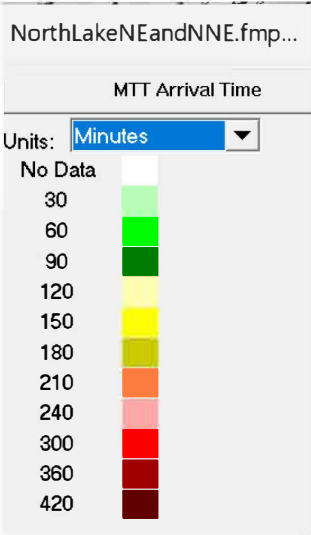




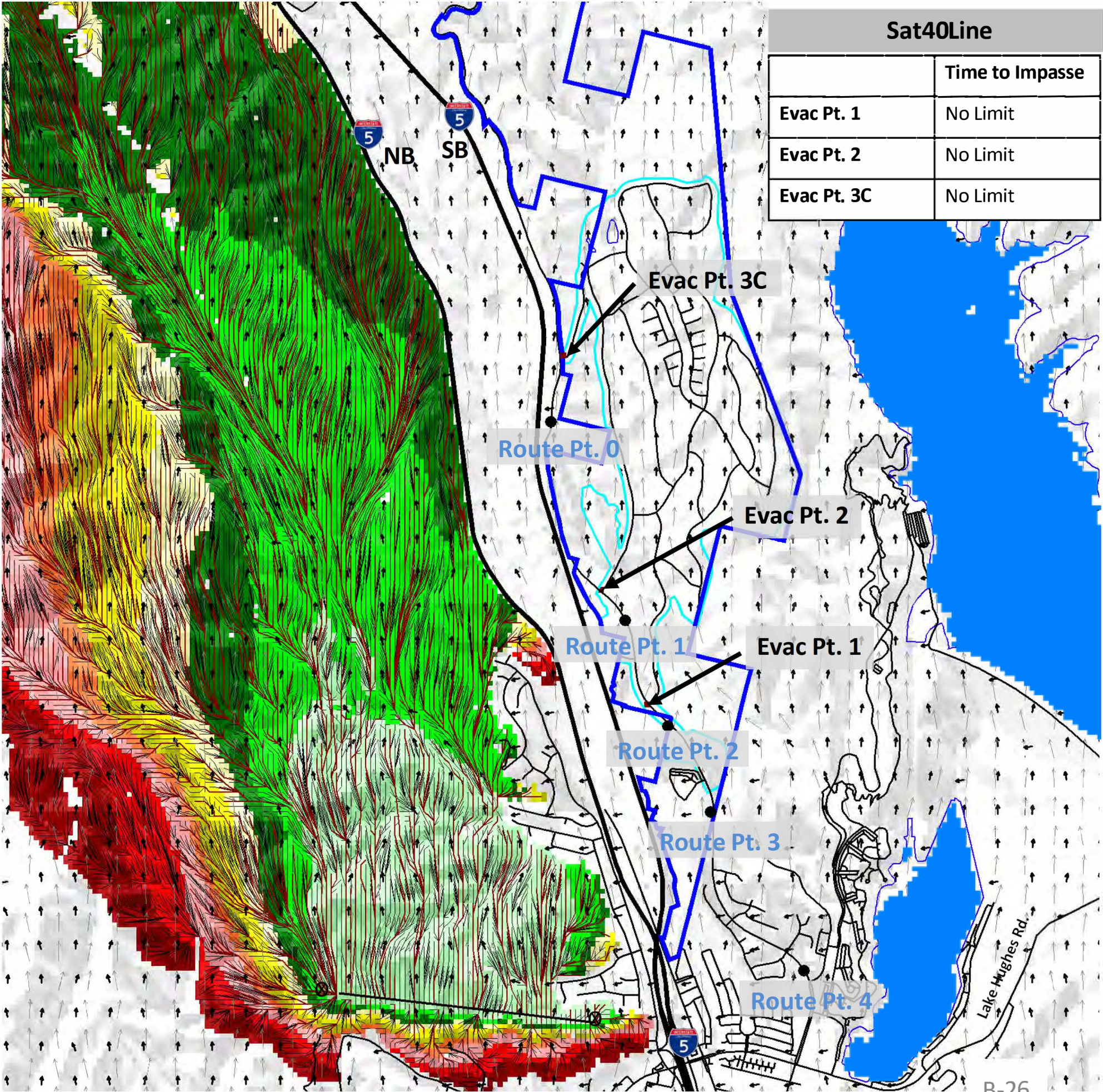
Wind Speed 40 mph (S direction)  
with Partial Creek Avoidance Development

This fire with 40 mph winds  
(sustained) starts from a larger  
established line of fire to the South.

The fire was not made to spot over  
the freeways and start again as the  
wind direction will not take the fire  
in the direction of the development.



S wind at 40 Line

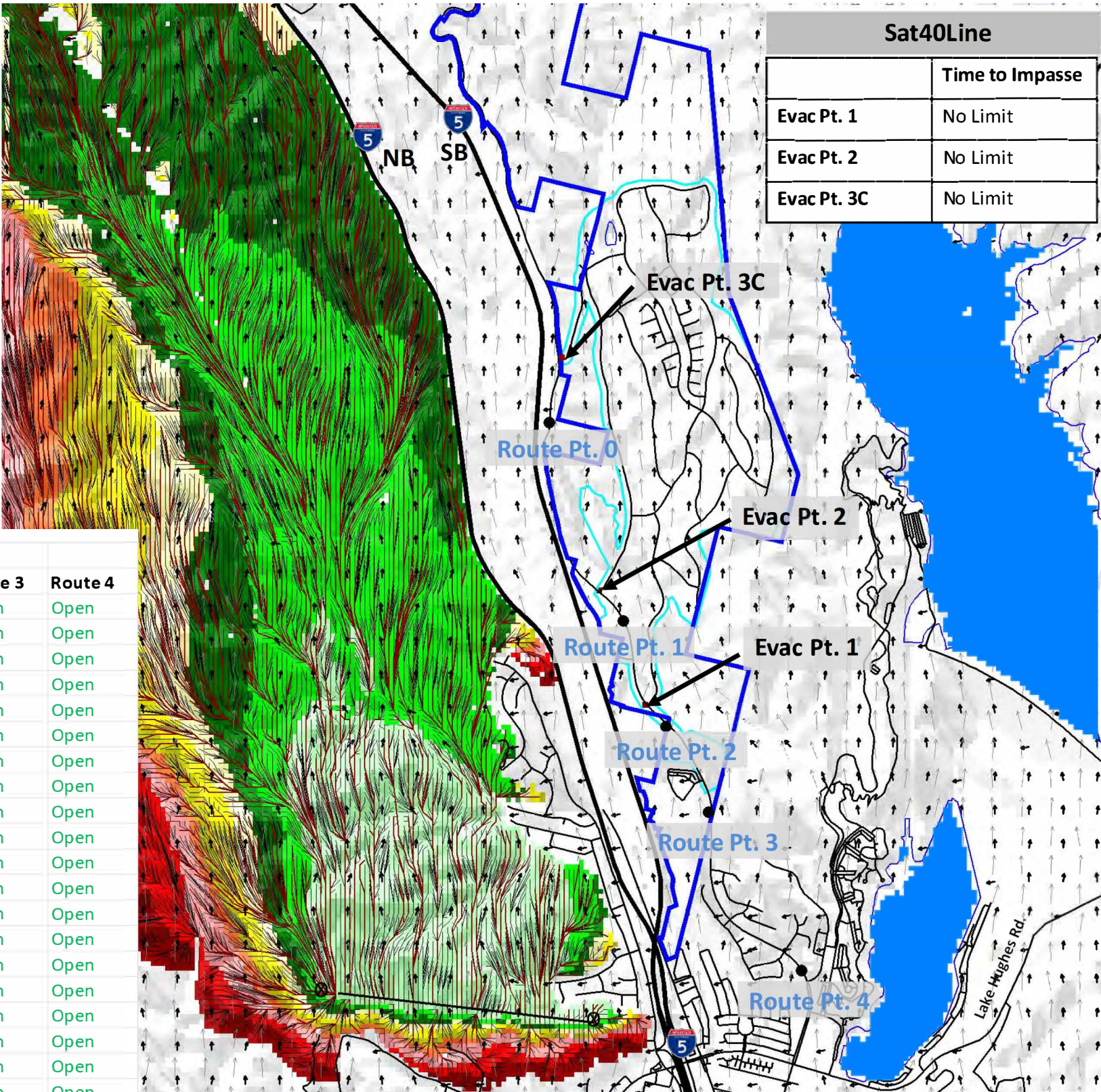




Wind Speed 40 mph (S direction)  
with Partial Creek Avoidance Development

Narrative: Fire as a line of fire west of the northbound I-5 under a South Wind at 40 mph with the head fire moving to the north (branching to the west but holding at the freeway on the east). The wind direction and location of the fire does not have a high probability of spotting over the freeway in the vicinity of the Project Site. The program did not provide spots and they were not added manually.

South Line at 40 mph Partial Avoid				Evacuation to the South							
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
30	0:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
45	0:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
60	1:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
75	1:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
90	1:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
105	1:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
120	2:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
135	2:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
150	2:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
165	2:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
180	3:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
195	3:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
210	3:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
225	3:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
240	4:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
255	4:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
270	4:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
285	4:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
300	5:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
315	5:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
330	5:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
345	5:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
360	6:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
375	6:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
390	6:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
405	6:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
420	7:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open

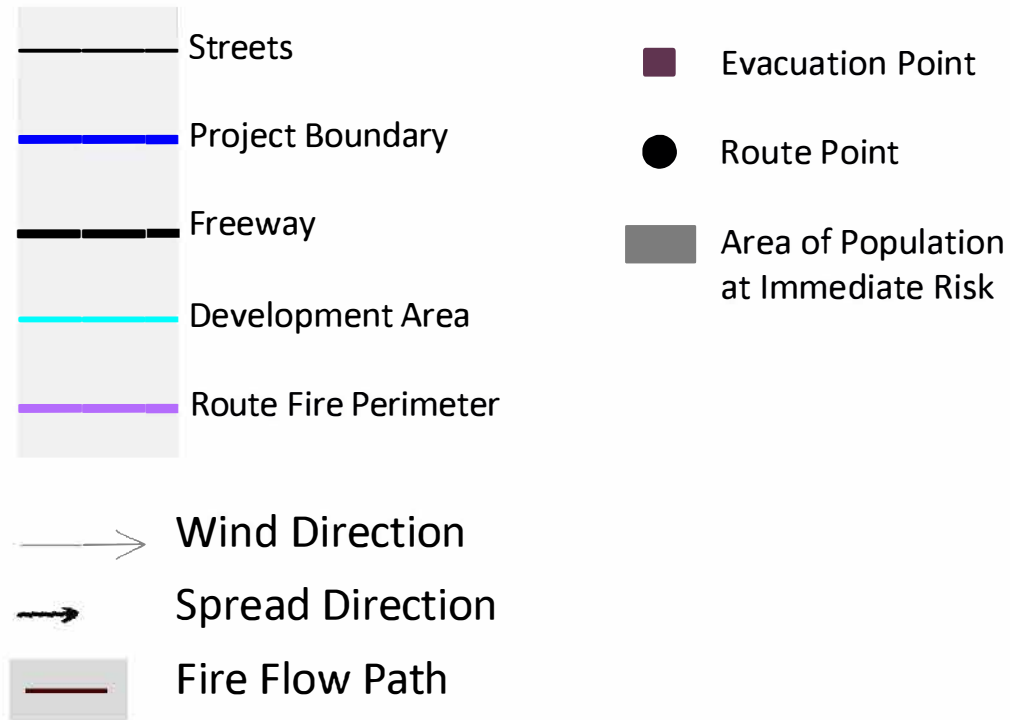




Spot Fire off Freeway NB (Wind S direction @ 40 mph) with Previously Approved Development

This fire with 40 mph winds (sustained) starts spot fires along side the I-5 NB at the side of the road.

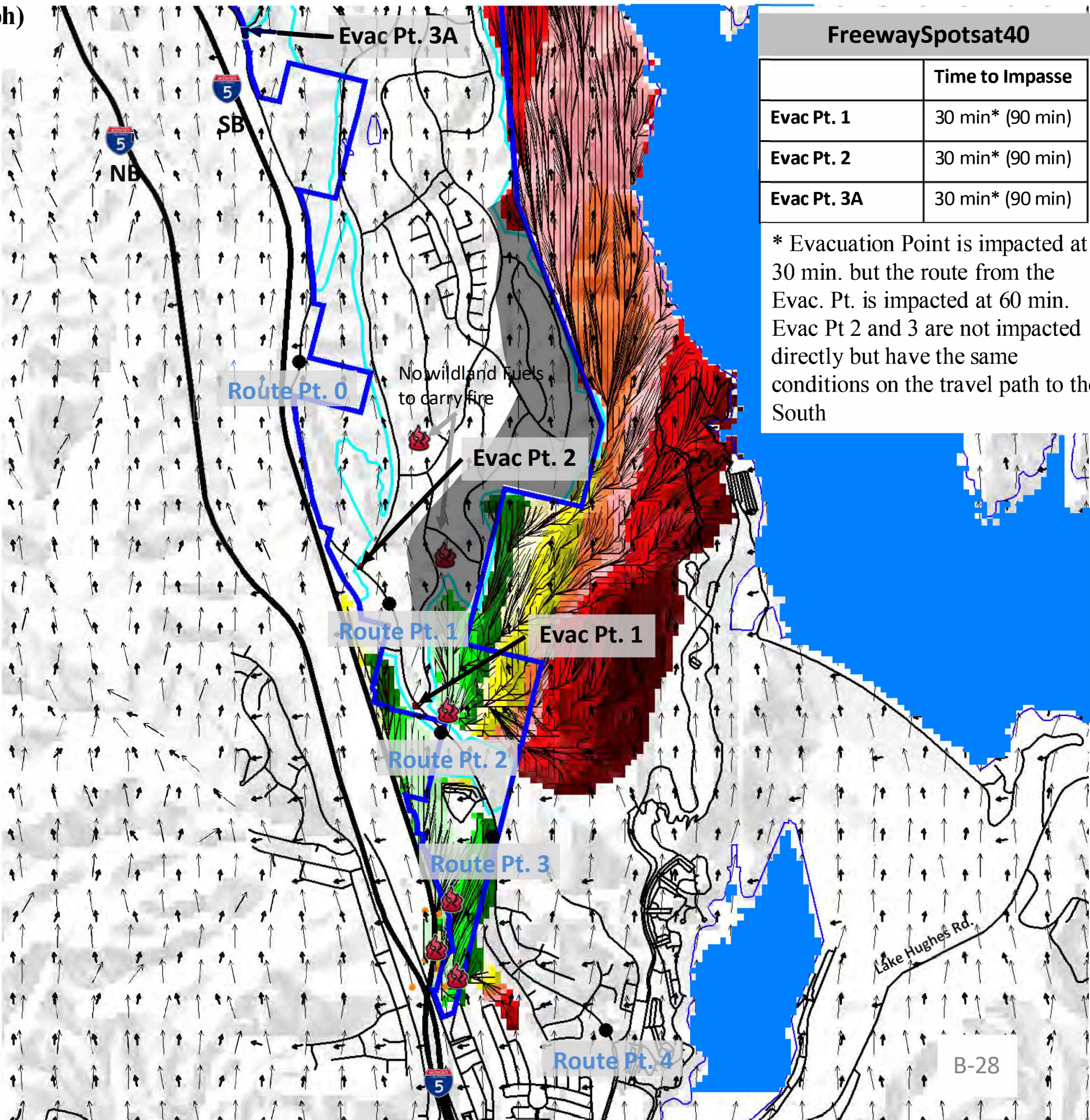
The fire was made to spot to the north where wildland fuels are present within the ember cast.



Origins of the Fire (spots)

Origin(first three spots)  
Fourth spot 30 additional min.  
Fifth spot 30 additional min.  
Sixth spot 30 more

S wind at 40 Spots



FreewaySpotsat40	
	Time to Impasse
Evac Pt. 1	30 min* (90 min)
Evac Pt. 2	30 min* (90 min)
Evac Pt. 3A	30 min* (90 min)

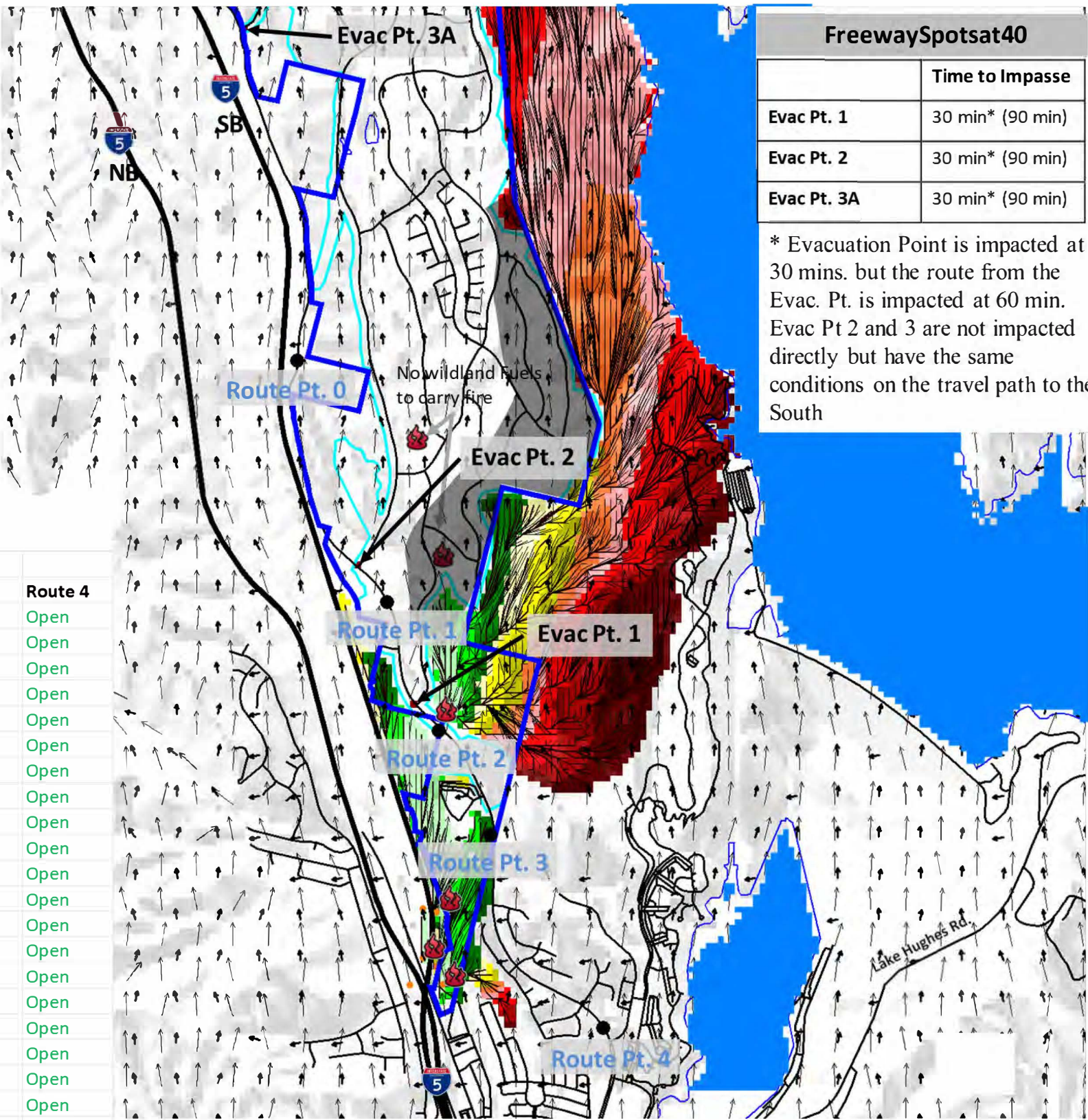
\* Evacuation Point is impacted at 30 min. but the route from the Evac. Pt. is impacted at 60 min. Evac Pt 2 and 3 are not impacted directly but have the same conditions on the travel path to the South



Spot Fire off Freeway NB (Wind S direction @ 40 mph)  
with Previously Approved Development

Narrative: Fire begins as a series of spot fires on the SB I-5 north of the NB/SB crossover. The fires is driven by a South wind at 40 mph. The fire was made to spot over Ridge Route in 30 min. It was made to spot again in another 30 min (60 min. elapsed time) to the north and a final time in another 30 min. (90 min. elapsed time). No flame propagation within the development area occurs. Ridge Route will be impacted for approximately 90 minutes for all Evac Points beginning 30 min into the scenario. Once the fire has passed this impact points, all Evac Points will reopen and remain open.

Freeway Spot at 40 mph Approved						Evacuation to the South				
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
30	0:30 Closed	Closed	Closed	n/a	n/a	Closed	Closed	Closed	Closed	Open
45	0:45 Closed	Closed	Closed	n/a	n/a	Closed	Closed	Closed	Closed	Open
60	1:00 Closed	Closed	Closed	n/a	n/a	Closed	Closed	Closed	Closed	Open
75	1:15 Closed	Closed	Closed	n/a	n/a	Closed	Closed	Closed	Closed	Open
90	1:30 Closed	Closed	Closed	n/a	n/a	Closed	Closed	Closed	Closed	Open
105	1:45 Closed	Closed	Closed	n/a	n/a	Closed	Closed	Closed	Closed	Open
120	2:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
135	2:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
150	2:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
165	2:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
180	3:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
195	3:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
210	3:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
225	3:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
240	4:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
255	4:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
270	4:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
285	4:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
300	5:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
315	5:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
330	5:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
345	5:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
360	6:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
375	6:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
390	6:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
405	6:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
420	7:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open

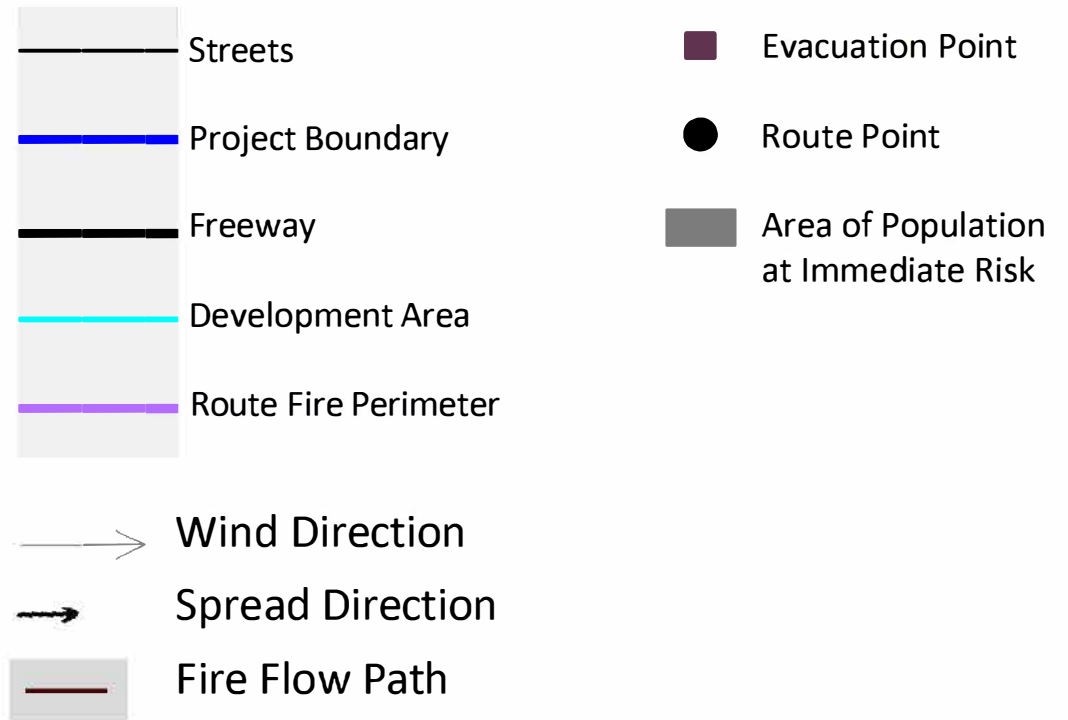




Spot Fire off Freeway NB (Wind S direction @ 40 mph)  
with Creek Avoidance Development

This fire with 40 mph winds (sustained) starts spot fires along side the I-5 NB at the side of the road.

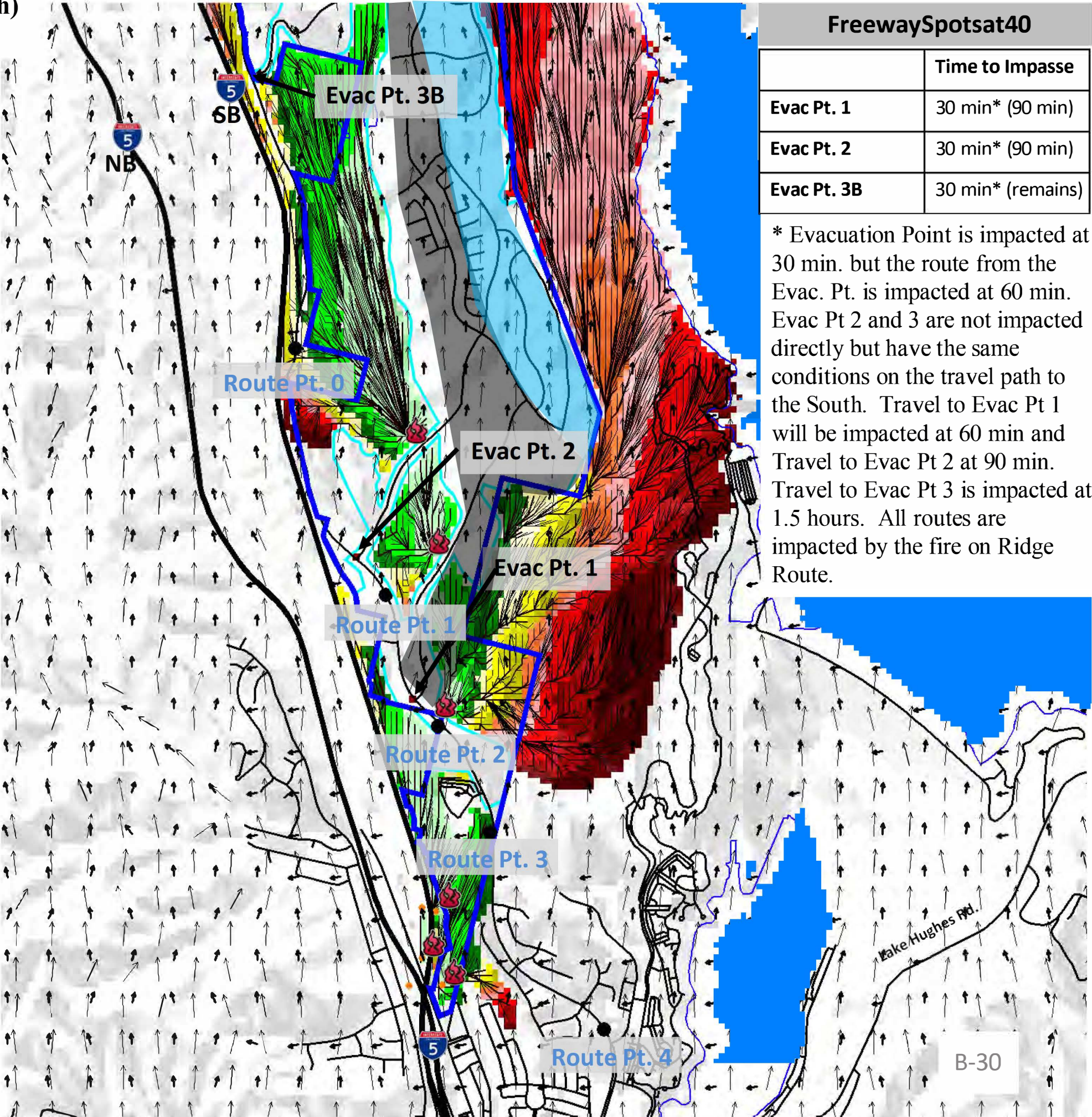
The fire was made to spot to the north where wildland fuels are present within the ember cast.



Origins of the Fire (spots)

Origin(first three spots)  
Fourth spot 30 additional min.  
Fifth spot 30 additional min.  
Sixth spot 30 more

S wind at 40 Spots



FreewaySpotsat40	
	Time to Impasse
Evac Pt. 1	30 min* (90 min)
Evac Pt. 2	30 min* (90 min)
Evac Pt. 3B	30 min* (remains)

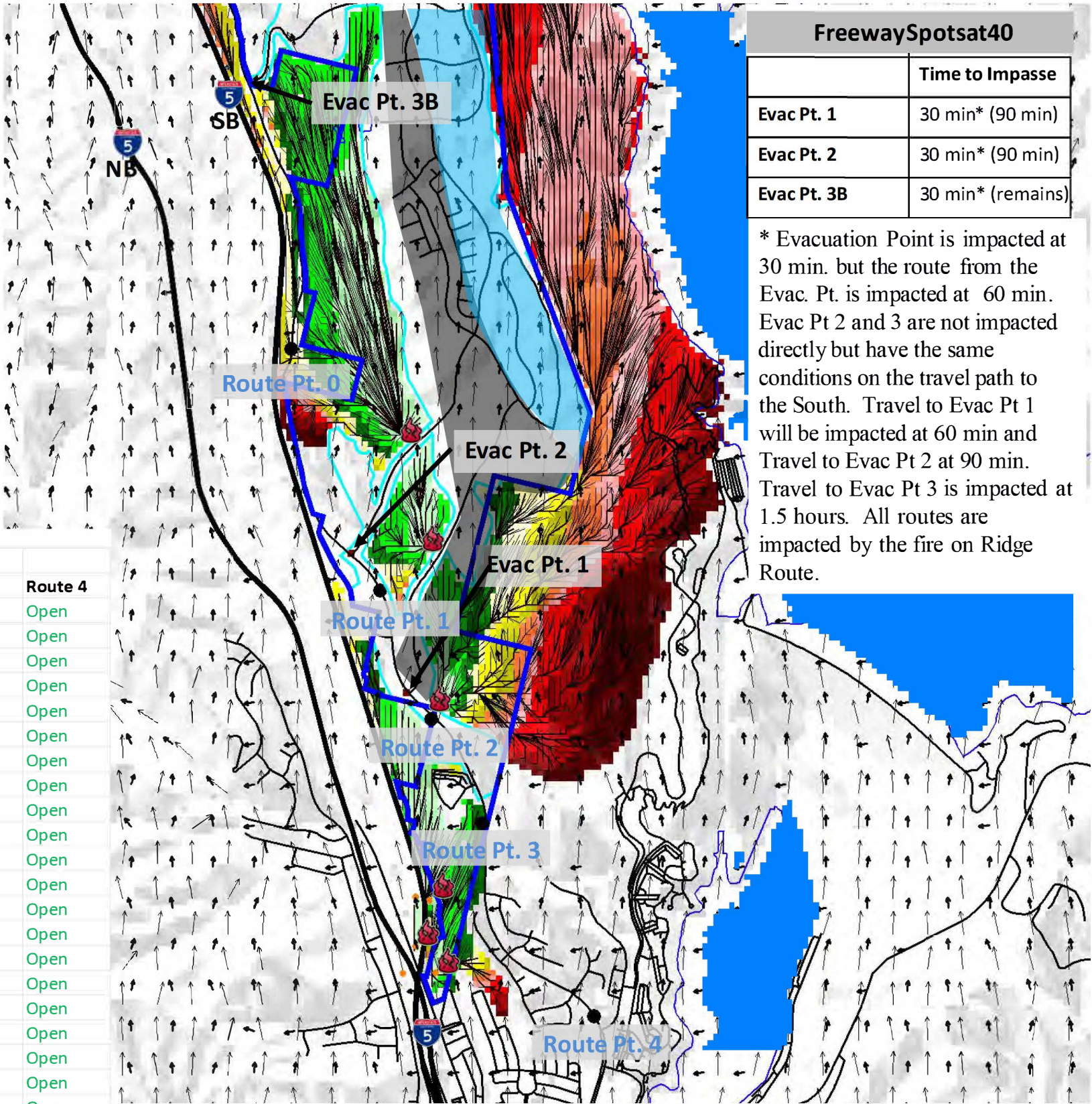
\* Evacuation Point is impacted at 30 min. but the route from the Evac. Pt. is impacted at 60 min. Evac Pt 2 and 3 are not impacted directly but have the same conditions on the travel path to the South. Travel to Evac Pt 1 will be impacted at 60 min and Travel to Evac Pt 2 at 90 min. Travel to Evac Pt 3 is impacted at 1.5 hours. All routes are impacted by the fire on Ridge Route.



Spot Fire off Freeway NB (Wind S direction @ 40 mph)  
with Creek Avoidance Development

Narrative: Fire begins as a series of spot fires on the SB I-5 north of the NB/SB crossover. The fires is driven by a South wind at 40 mph. The fire was made to spot over Ridge Route in 30 min. It was made to spot again in another 30 min (60 min. elapsed time) to the north and a final time in another 30 min. (90 min. elapsed time). Ridge Route will be impacted for approximately 90 minutes for all Evac Points beginning 30 min into the scenario. Once the fire has passed this impact points, all Evac Points will reopen and remain open.

Freeway Spot at 40 mph Avoid	Evacuation to the South									
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
30	0:30 Closed	Closed	n/a	Closed	n/a	Closed	Closed	Closed	Closed	Open
45	0:45 Closed	Closed	n/a	Closed	n/a	Closed	Closed	Closed	Closed	Open
60	1:00 Closed	Closed	n/a	Closed	n/a	Closed	Closed	Closed	Closed	Open
75	1:15 Closed	Closed	n/a	Closed	n/a	Closed	Closed	Closed	Closed	Open
90	1:30 Closed	Closed	n/a	Closed	n/a	Closed	Closed	Closed	Closed	Open
105	1:45 Closed	Closed	n/a	Closed	n/a	Closed	Closed	Closed	Closed	Open
120	2:00 Open	Closed	n/a	Closed	n/a	Closed	Open	Open	Open	Open
135	2:15 Open	Closed	n/a	Closed	n/a	Closed	Open	Open	Open	Open
150	2:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
165	2:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
180	3:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
195	3:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
210	3:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
225	3:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
240	4:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
255	4:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
270	4:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
285	4:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
300	5:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
315	5:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
330	5:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
345	5:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
360	6:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
375	6:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
390	6:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
405	6:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
420	7:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open



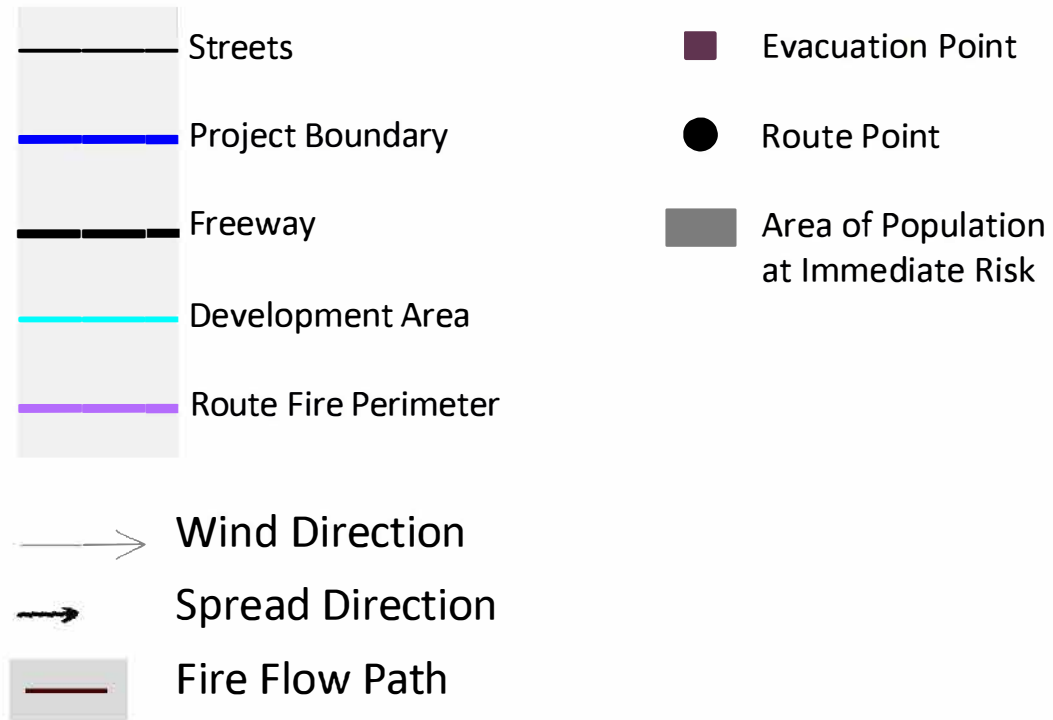
An early shelter in place order is likely with evacuation after the fire front has cleared Evac Pt. 1 and Route Pts 2 and 3.



Spot Fire off Freeway NB (Wind S direction @ 40 mph) with Partial Creek Avoidance Development

This fire with 40 mph winds (sustained) starts spot fires along side the I-5 NB at the side of the road.

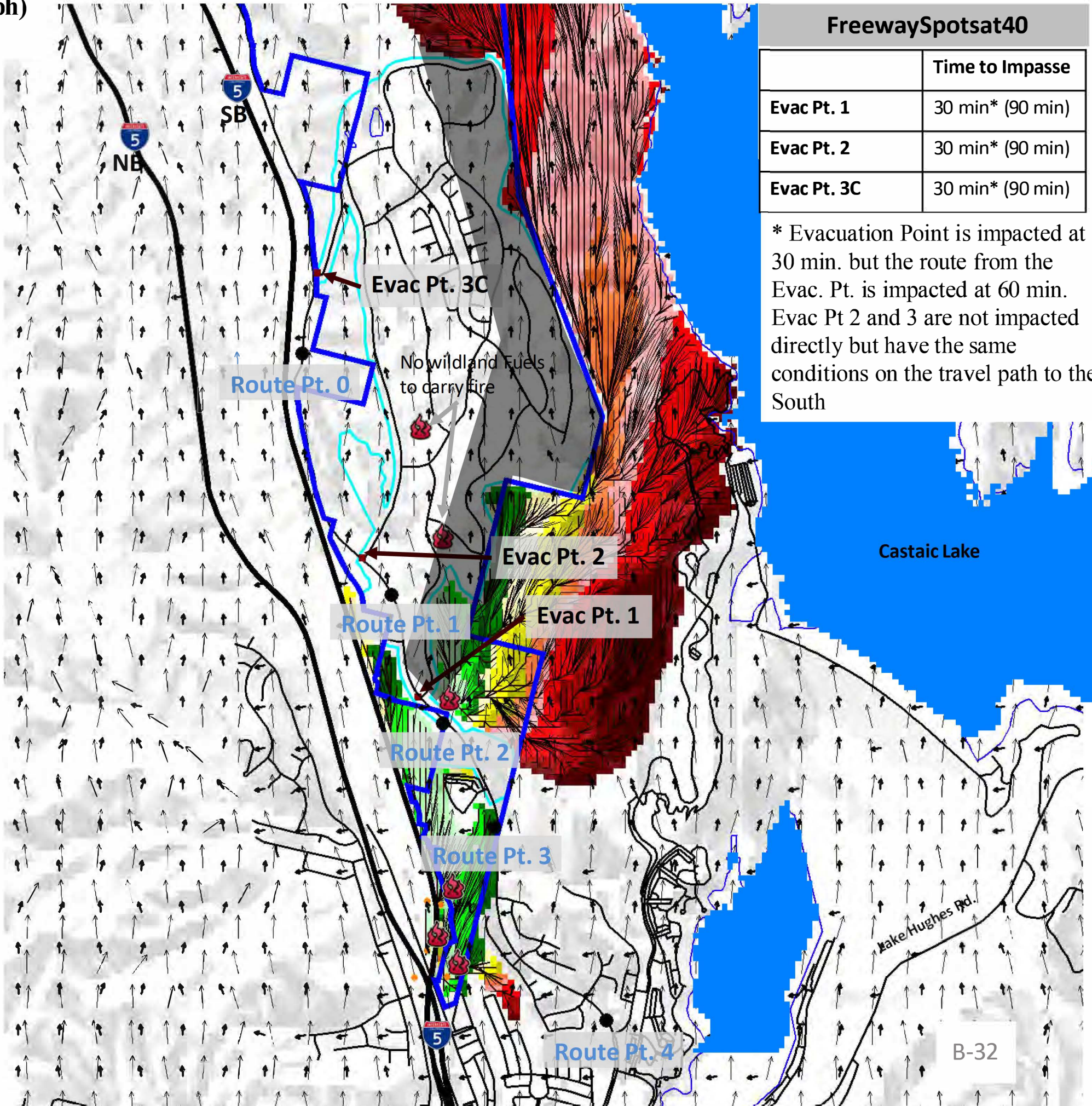
The fire was made to spot to the north where wildland fuels are present within the ember cast.



Origins of the Fire (spots)

Origin(first three spots)  
Fourth spot 30 additional min.  
Fifth spot 30 additional min.  
Sixth spot 30 more

S wind at 40 Spots



FreewaySpotsat40	
	Time to Impasse
Evac Pt. 1	30 min* (90 min)
Evac Pt. 2	30 min* (90 min)
Evac Pt. 3C	30 min* (90 min)

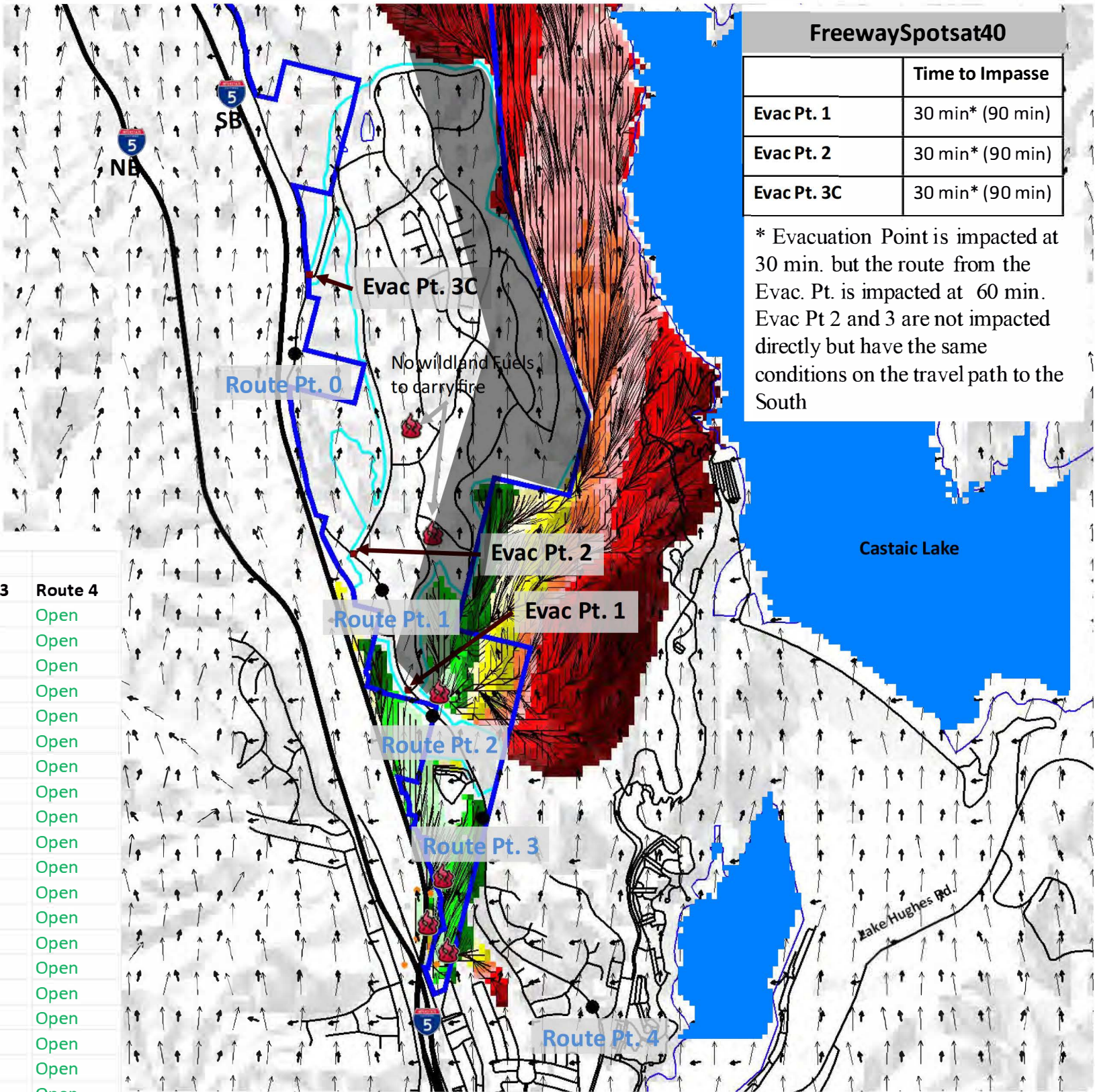
\* Evacuation Point is impacted at 30 min. but the route from the Evac. Pt. is impacted at 60 min. Evac Pt 2 and 3 are not impacted directly but have the same conditions on the travel path to the South



Spot Fire off Freeway NB (Wind S direction @ 40 mph)  
with Partial Creek Avoidance Development

Narrative: Fire begins as a series of spot fires on the SB I-5 north of the NB/SB crossover. The fires is driven by a South wind at 40 mph. The fire was made to spot over Ridge Route in 30 min. It was made to spot again in another 30 min (60 min. elapsed time) to the north and a final time in another 30 min. (90 min. elapsed time). No flame propagation within the development area occurs. Ridge Route will be impacted for approximately 90 minutes for all Evac Points beginning 30 min into the scenario. Once the fire has passed this impact points, all Evac Points will reopen and remain open.

Freeway Spot at 40 mph Partial Avoid		Evacuation to the South									
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
30	0:30	Closed	Closed	n/a	n/a	Closed	Closed	Closed	Closed	Closed	Open
45	0:45	Closed	Closed	n/a	n/a	Closed	Closed	Closed	Closed	Closed	Open
60	1:00	Closed	Closed	n/a	n/a	Closed	Closed	Closed	Closed	Closed	Open
75	1:15	Closed	Closed	n/a	n/a	Closed	Closed	Closed	Closed	Closed	Open
90	1:30	Closed	Closed	n/a	n/a	Closed	Closed	Closed	Closed	Closed	Open
105	1:45	Closed	Closed	n/a	n/a	Closed	Closed	Closed	Closed	Closed	Open
120	2:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
135	2:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
150	2:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
165	2:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
180	3:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
195	3:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
210	3:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
225	3:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
240	4:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
255	4:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
270	4:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
285	4:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
300	5:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
315	5:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
330	5:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
345	5:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
360	6:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
375	6:15	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
390	6:30	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
405	6:45	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
420	7:00	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open





Origin with the County Recreation Area (Wind S direction @ 40 mph)  
with Previously Approved Development

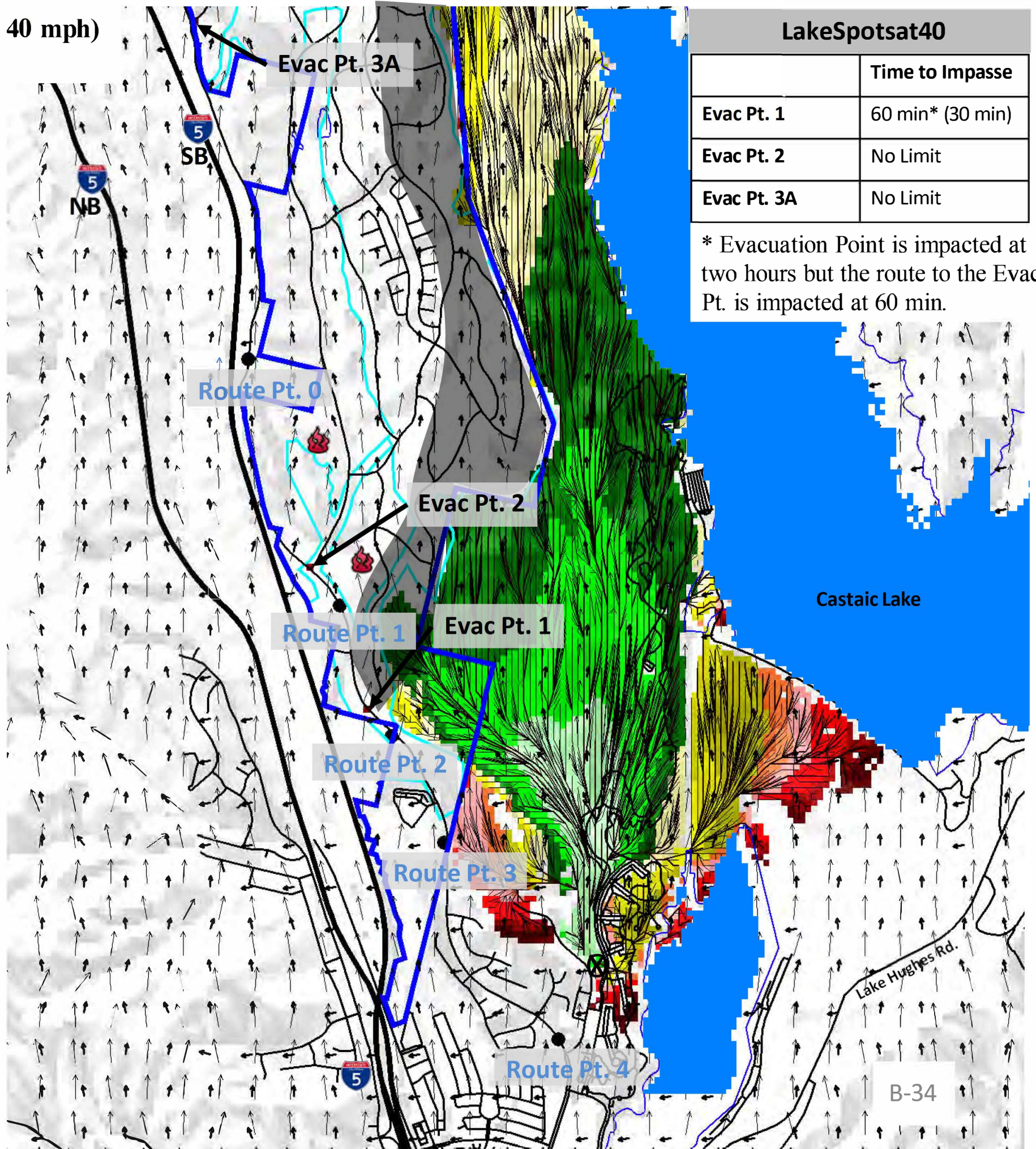
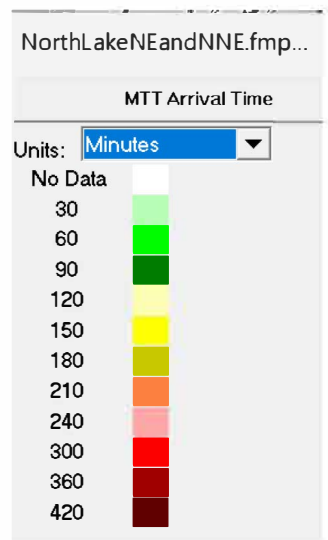
This fire with 40 mph winds  
(sustained) starts from single source  
within the County Recreation Area.

The fire progress is rapid in the  
areas of alignment (wind, fuel,  
topography).



Origin to first spot 90 min.  
First spot to second spot 30 min.

S wind at 40 Spots



LakeSpotsat40	
	Time to Impasse
Evac Pt. 1	60 min* (30 min)
Evac Pt. 2	No Limit
Evac Pt. 3A	No Limit

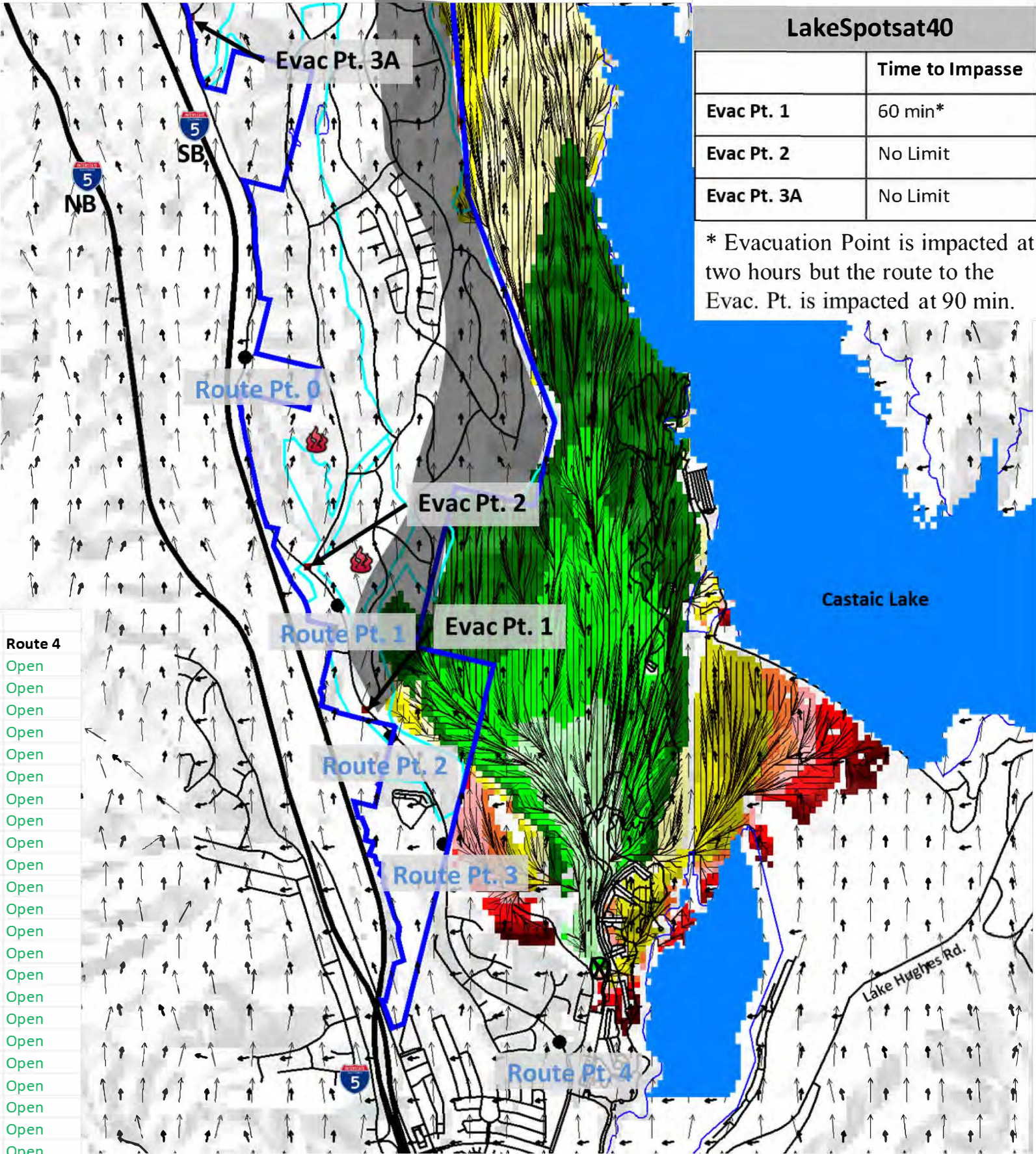
\* Evacuation Point is impacted at two hours but the route to the Evac. Pt. is impacted at 60 min.



Origin with the County Recreation Area (Wind S direction @ 40 mph) with Previously Approved Development

Narrative: Fire begins as spot fires in the Recreation Area under a South Wind at 40 mph with the head fire moving to the north (branching to the east and west). Fire does not spot over roadways on the west side due to development. Fire continues to burn to the north on the east side of the Project Site.

Lake Spots at 40 mph Approved		Evacuation to the South								
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
30	0:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
45	0:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
60	1:00 Closed	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
75	1:15 Closed	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
90	1:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
105	1:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
120	2:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
135	2:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
150	2:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
165	2:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
180	3:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
195	3:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
210	3:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
225	3:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
240	4:00 Open	Open	Open	n/a	n/a	Open	Closed	Closed	Closed	Open
255	4:15 Open	Open	Open	n/a	n/a	Open	Closed	Closed	Closed	Open
270	4:30 Open	Open	Open	n/a	n/a	Open	Closed	Closed	Closed	Open
285	4:45 Open	Open	Open	n/a	n/a	Open	Closed	Closed	Closed	Open
300	5:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
315	5:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
330	5:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
345	5:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
360	6:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
375	6:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
390	6:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
405	6:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
420	7:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open



LakeSpotsat40	
	Time to Impasse
Evac Pt. 1	60 min*
Evac Pt. 2	No Limit
Evac Pt. 3A	No Limit
* Evacuation Point is impacted at two hours but the route to the Evac. Pt. is impacted at 90 min.	



Origin with the County Recreation Area (Wind S direction @ 40 mph)  
with Creek Avoidance Development

This fire with 40 mph winds (sustained) starts from single source within the County Recreation Area.

The fire progress is rapid in the areas of alignment (wind, fuel, topography).

Streets

Project Boundary

Freeway

Development Area

Route Fire Perimeter

Evacuation Point

Route Point

Area of Population at Immediate Risk

Wind Direction

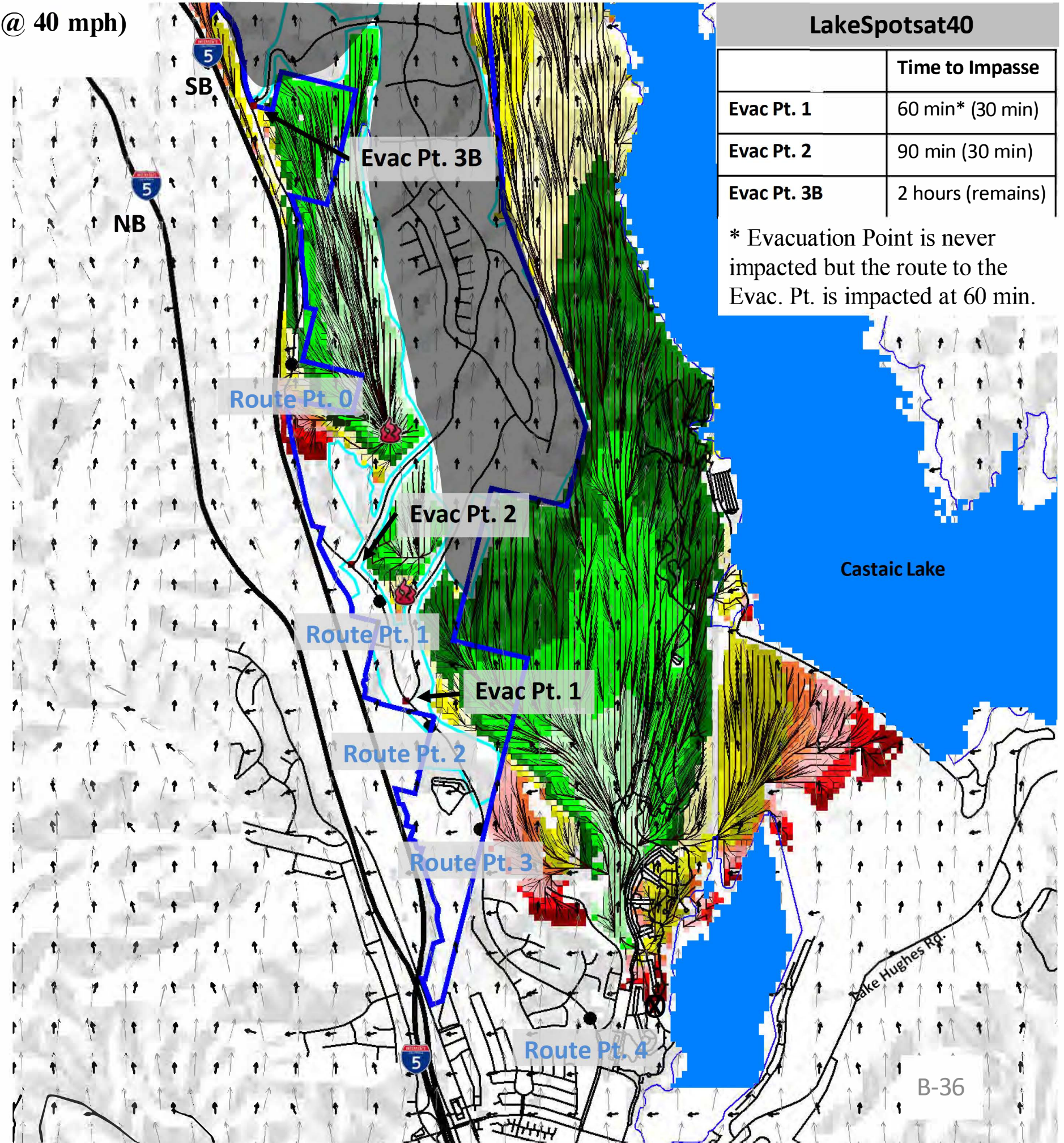
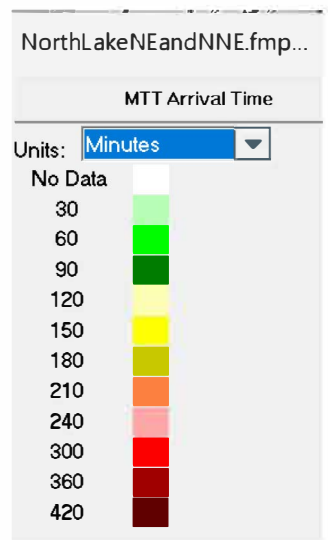
Spread Direction

Fire Flow Path

Origins of the Fire

Spot Fire

Origin to first spot 60 min.  
First spot to second spot 30 min.  
S wind at 40 Spots



LakeSpotsat40	
	Time to Impasse
Evac Pt. 1	60 min* (30 min)
Evac Pt. 2	90 min (30 min)
Evac Pt. 3B	2 hours (remains)

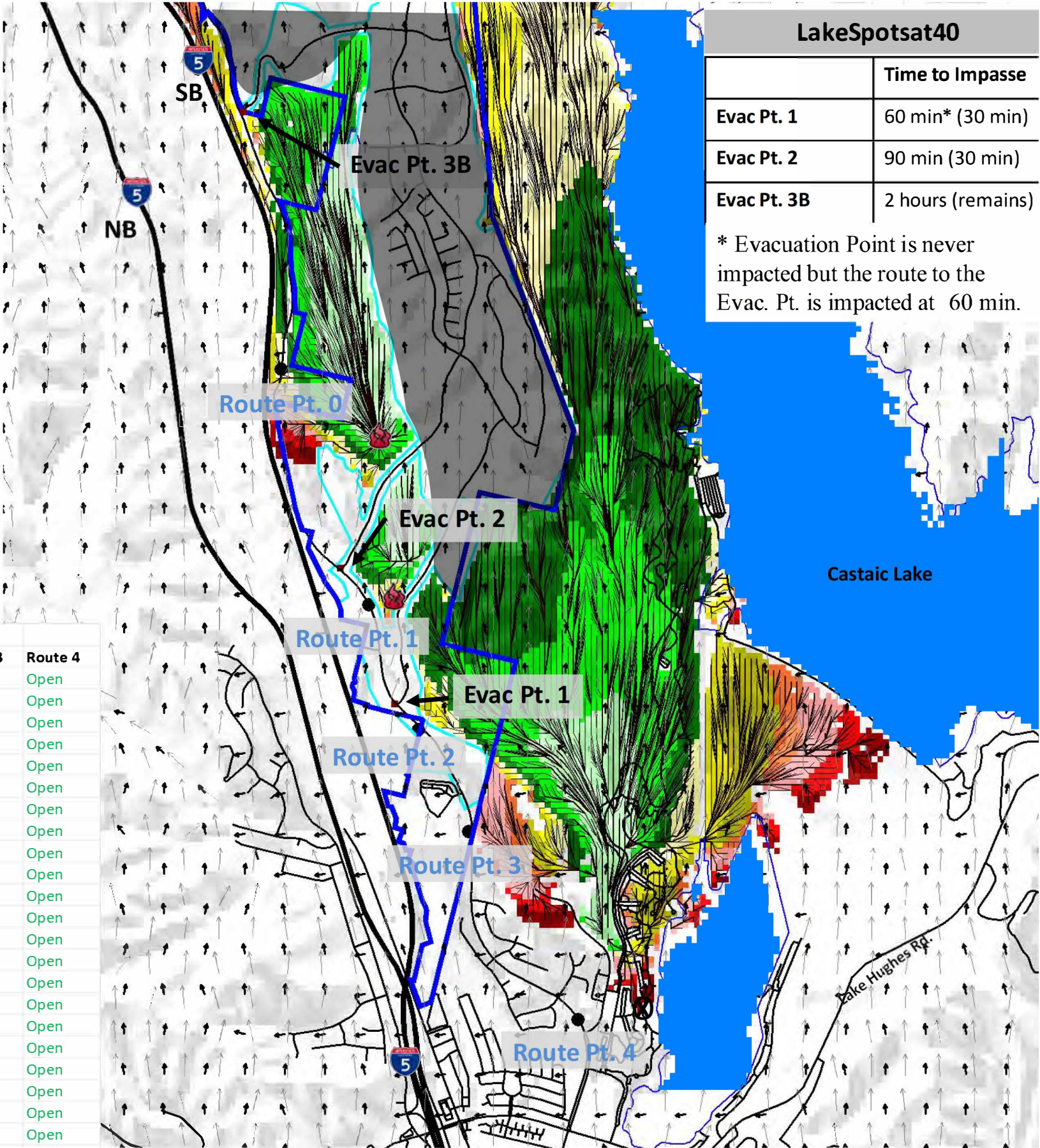
\* Evacuation Point is never impacted but the route to the Evac. Pt. is impacted at 60 min.



Origin with the County Recreation Area (Wind S direction @ 40 mph) with Creek Avoidance Development

Narrative: Fire begins as spot fires in the Recreation Area under a South Wind at 40 mph with the head fire moving to the north (branching to the east and west). At 60 min (elapsed time) fire spots over the access road to Evac Point 1, closing the access for 30 minutes. The fire on the west continues to burn north and spots over the access to Evac Point 2 at 90 min (elapsed time) and continues to burn to the north on both sides of the Project Site.

Lake Spots at 40 mph Creek Avoidance			Evacuation to the South							
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
30	0:30 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
45	0:45 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
60	1:00 Closed	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
75	1:15 Closed	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
90	1:30 Open	Closed	n/a	Open	n/a	Open	Open	Open	Open	Open
105	1:45 Open	Closed	n/a	Open	n/a	Open	Open	Open	Open	Open
120	2:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
135	2:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
150	2:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
165	2:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
180	3:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
195	3:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
210	3:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
225	3:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
240	4:00 Open	Open	n/a	Closed	n/a	Closed	Closed	Closed	Closed	Open
255	4:15 Open	Open	n/a	Closed	n/a	Closed	Closed	Closed	Closed	Open
270	4:30 Open	Open	n/a	Closed	n/a	Closed	Closed	Closed	Closed	Open
285	4:45 Open	Open	n/a	Closed	n/a	Closed	Closed	Closed	Closed	Open
300	5:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
315	5:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
330	5:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
345	5:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
360	6:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
375	6:15 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
390	6:30 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
405	6:45 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
420	7:00 Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open

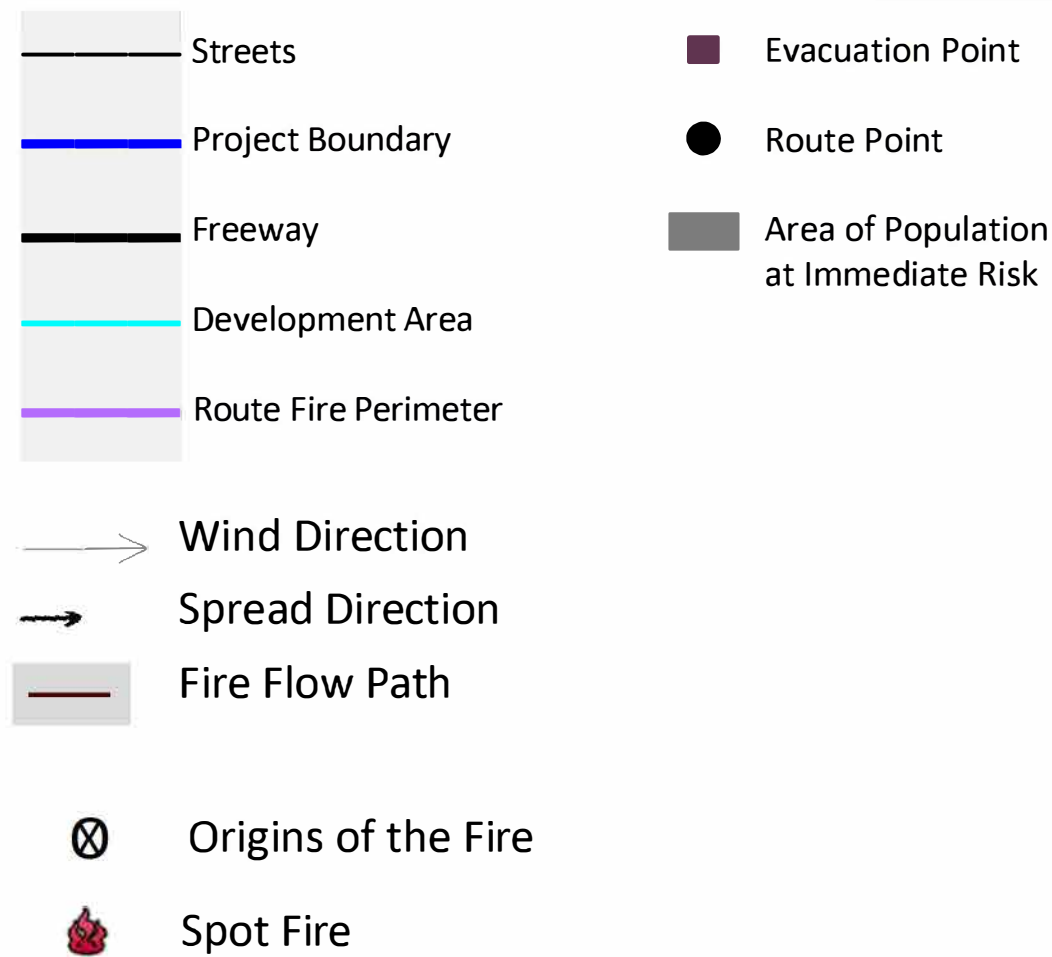




Origin with the County Recreation Area (Wind S direction @ 40 mph)  
with Partial Creek Avoidance Development

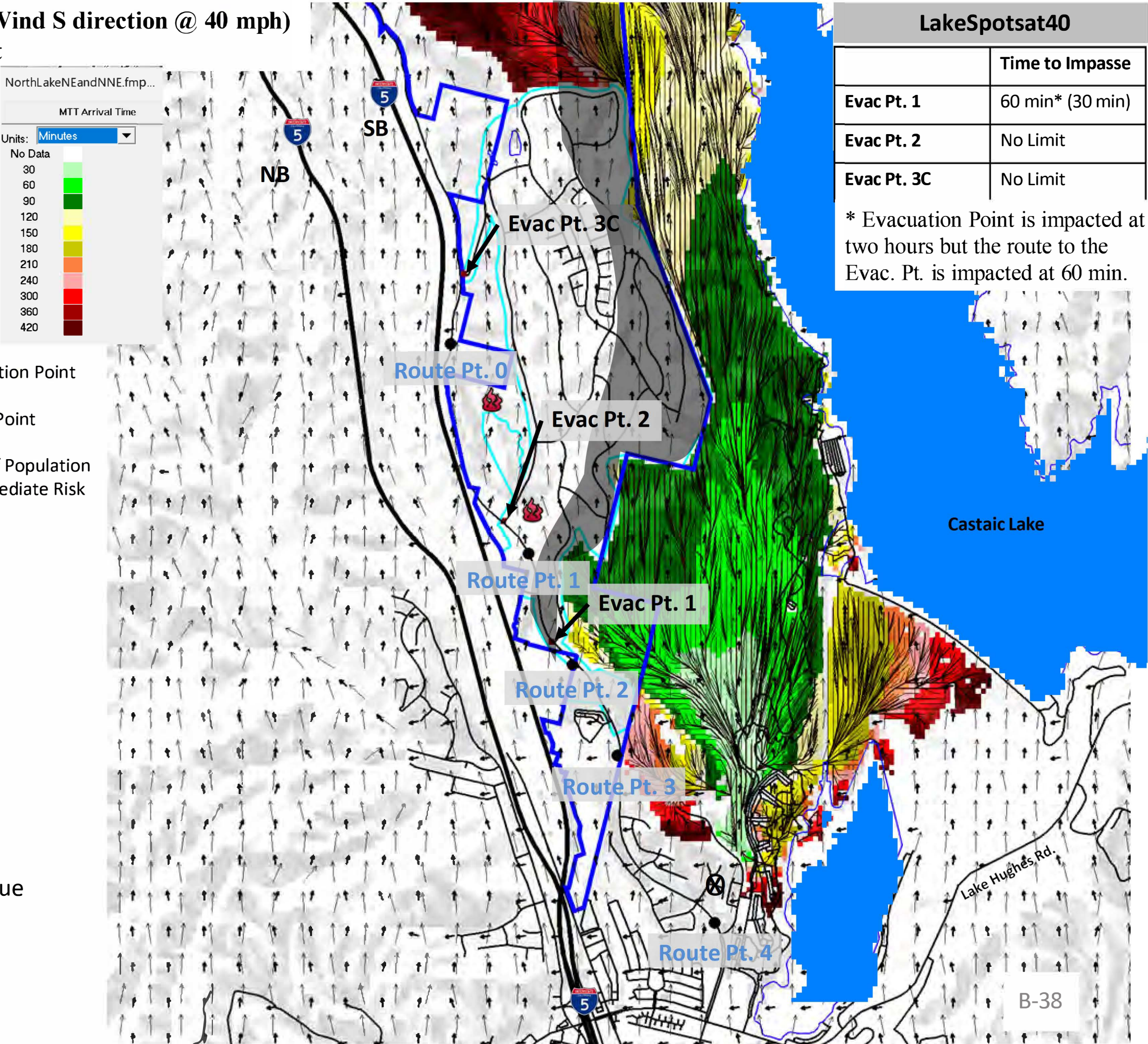
This fire with 40 mph winds (sustained) starts from single source within the County Recreation Area.

The fire progress is rapid in the areas of alignment (wind, fuel, topography).



Fire does not spot over evacuation roads due to development areas

S wind at 40 Spots

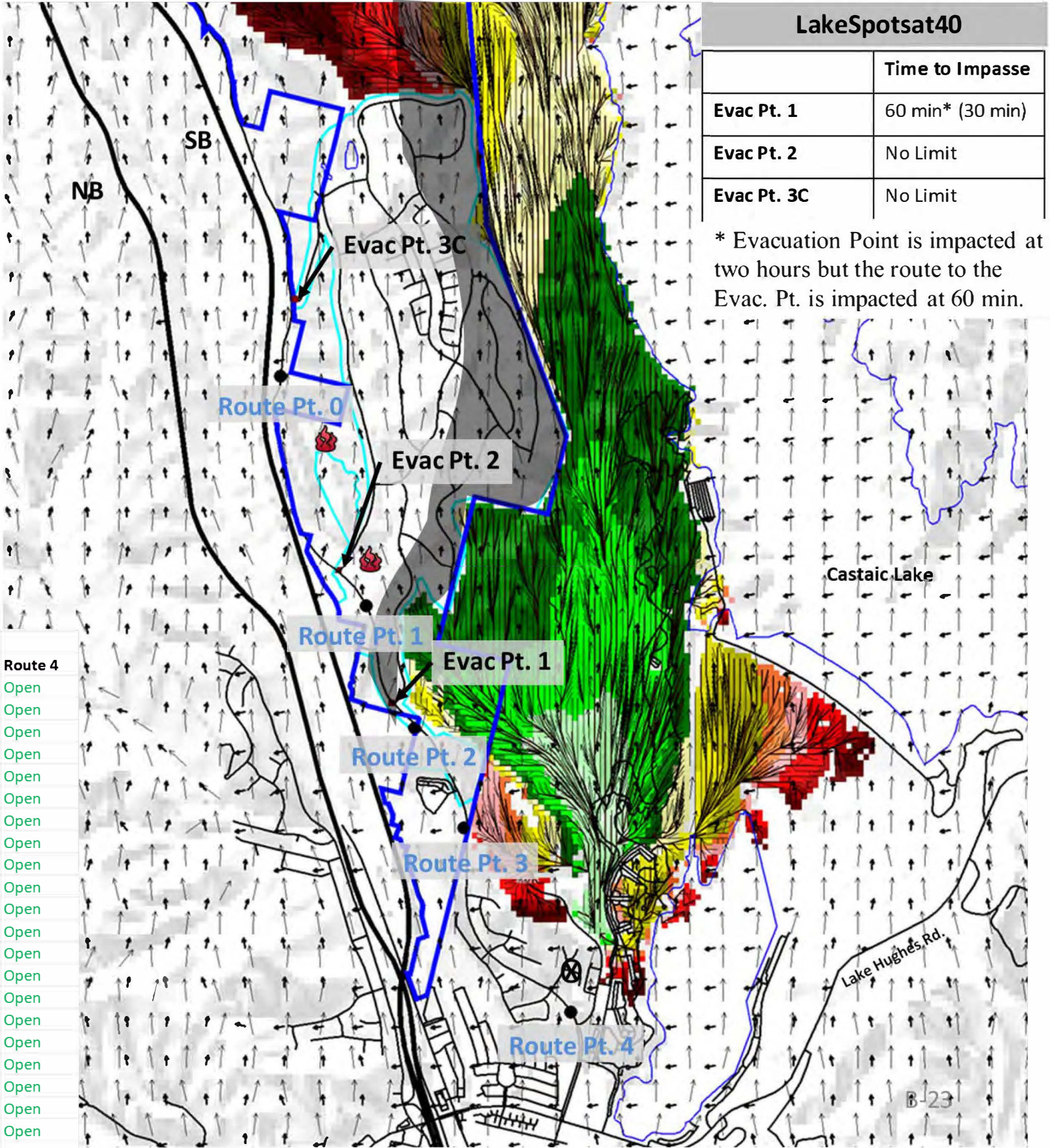




Origin with the County Recreation Area (Wind S direction @ 40 mph) with Partial Creek Avoidance Development

Narrative: Fire begins as spot fires in the Recreation Area under a South Wind at 40 mph with the head fire moving to the north (branching to the east and west). Fire does not spot over roadways on the west side due to development. Fire continues to burn to the north on the east side of the Project Site.

Lake Spots at 40 mph	Parital Creek Avoidance		Evacuation to the South							
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
30	0:30 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
45	0:45 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
60	1:00 Closed	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
75	1:15 Closed	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
90	1:30 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
105	1:45 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
120	2:00 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
135	2:15 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
150	2:30 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
165	2:45 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
180	3:00 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
195	3:15 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
210	3:30 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
225	3:45 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
240	4:00 Open	Open	n/a	n/a	Open	Open	Closed	Closed	Closed	Open
255	4:15 Open	Open	n/a	n/a	Open	Open	Closed	Closed	Closed	Open
270	4:30 Open	Open	n/a	n/a	Open	Open	Closed	Closed	Closed	Open
285	4:45 Open	Open	n/a	n/a	Open	Open	Closed	Closed	Closed	Open
300	5:00 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
315	5:15 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
330	5:30 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
345	5:45 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
360	6:00 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
375	6:15 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
390	6:30 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
405	6:45 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open
420	7:00 Open	Open	n/a	n/a	Open	Open	Open	Open	Open	Open



LakeSpotsat40	
	Time to Impasse
Evac Pt. 1	60 min* (30 min)
Evac Pt. 2	No Limit
Evac Pt. 3C	No Limit

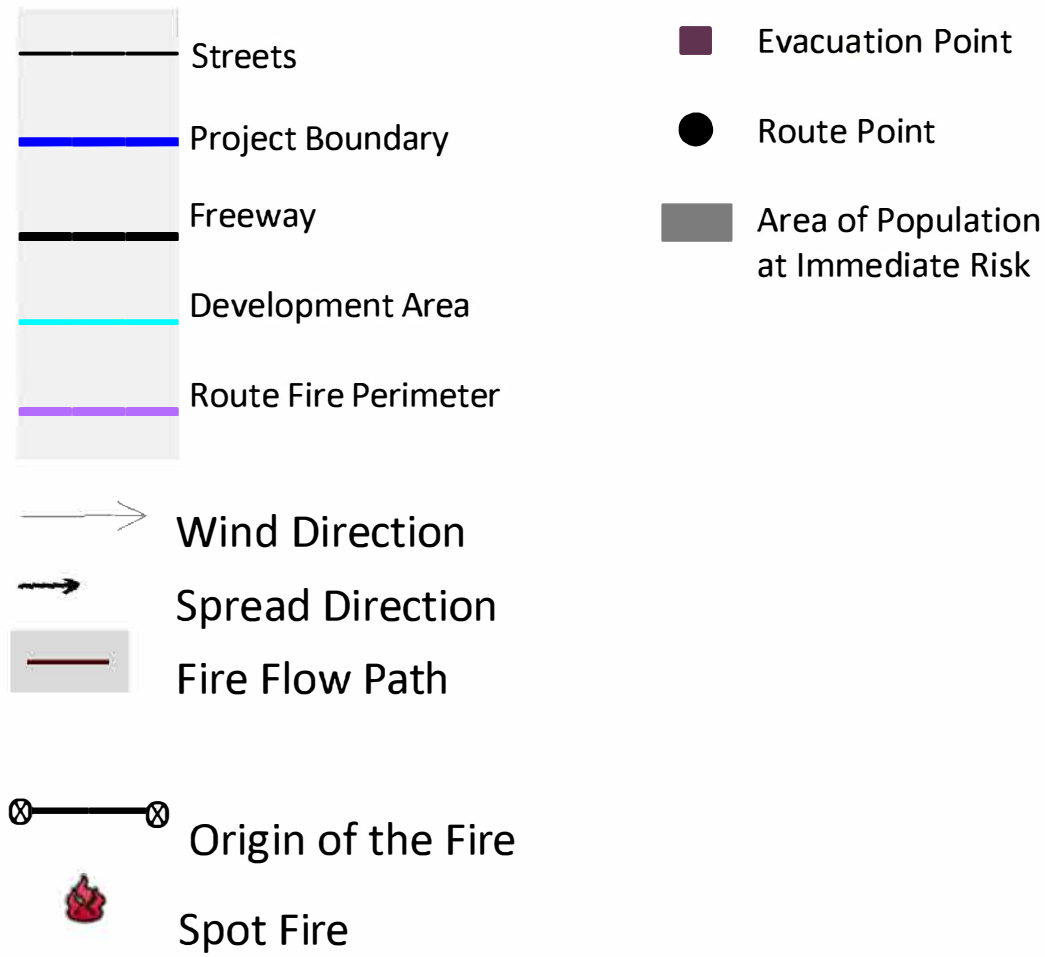
\* Evacuation Point is impacted at two hours but the route to the Evac. Pt. is impacted at 60 min.



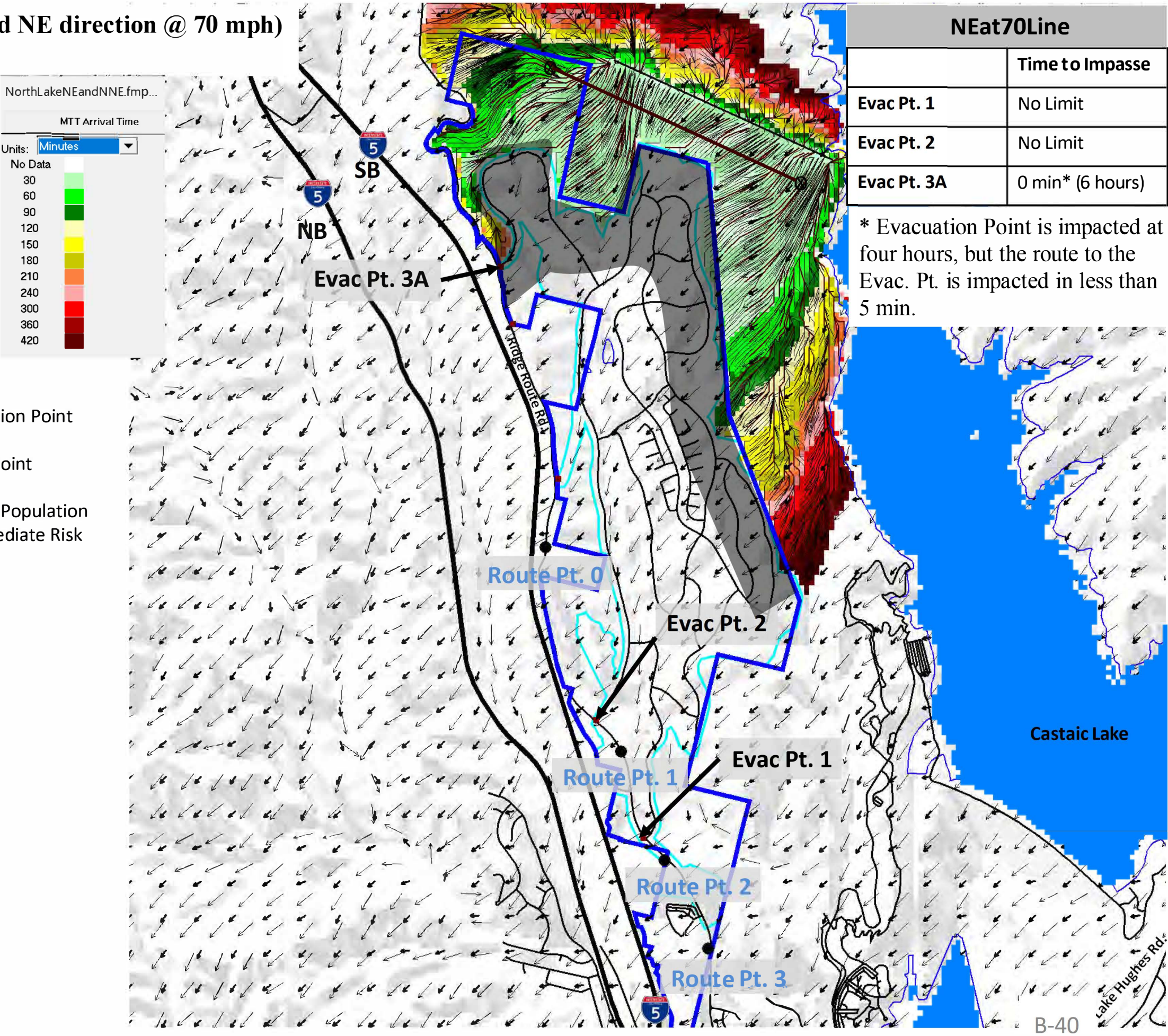
Wind Driven Fire at North Interface (Wind NE direction @ 70 mph) with Previously Approved Development

This fire with 70 mph winds (sustained) shows the timing from the fire as it interfaces with the proposed community.

The fire was not made to spot over the freeways and start again as the wind direction will not take the fire in the direction of the development.



NE wind at 70 Line

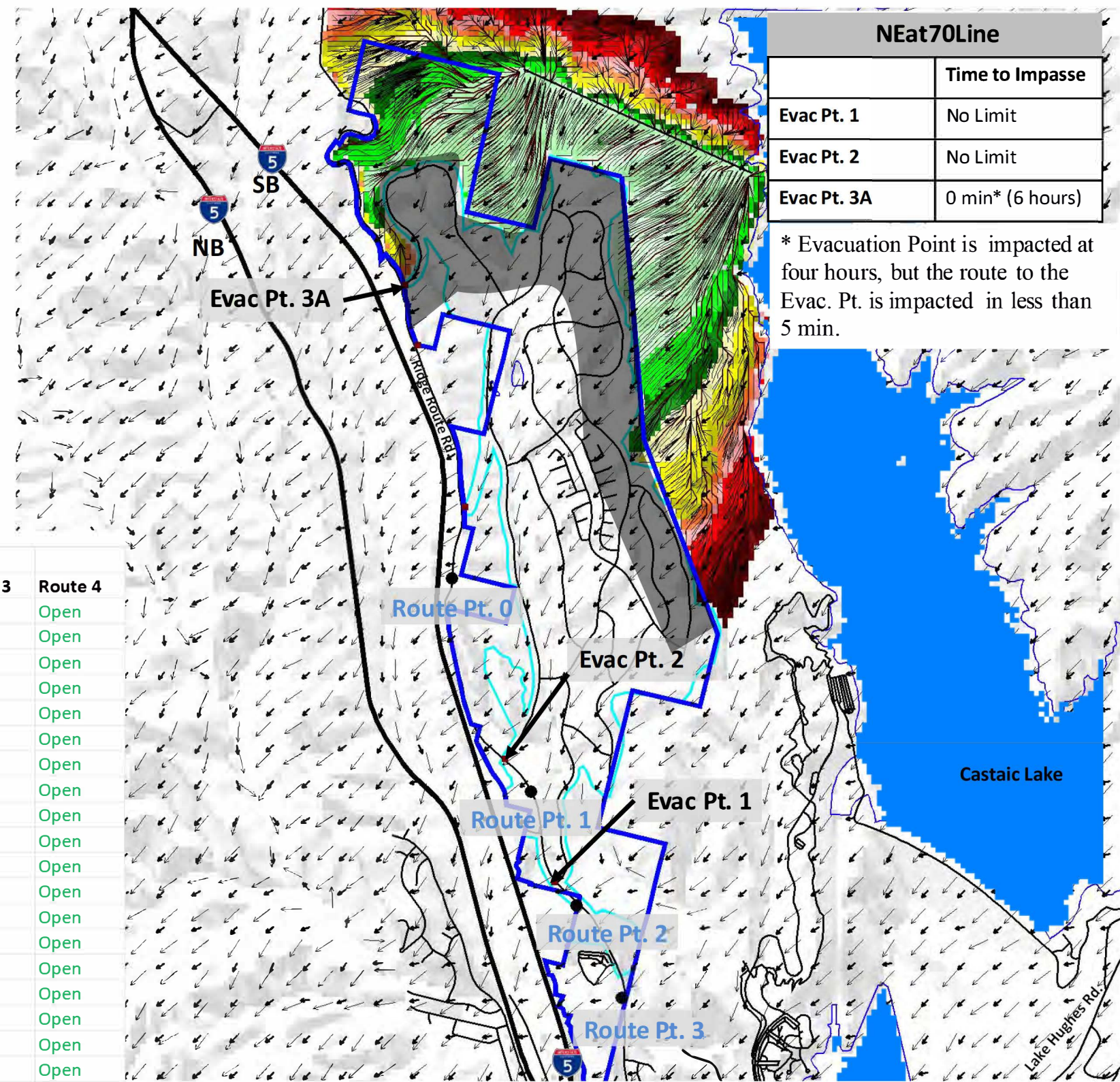




Wind Driven Fire at North Interface (Wind NE direction @ 70 mph) with Previously Approved Development

Narrative: Fire is modeled from an existing line of fire to the NE of the Project Site. Wind is from the NE at 70 mph. Fire impact the Project Site in less than 5 minutes if the fire has progressed to this point. Fire continues to burn south along the eastern edge of the Project Site. Fire may spot across the freeway but will not impact the evacuation points or route points if it did so if was not modeled.

NE at 70 mph Approved		Evacuation to the South									
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4	
15	0:15 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
30	0:30 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
45	0:45 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
60	1:00 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
75	1:15 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
90	1:30 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
105	1:45 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
120	2:00 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
135	2:15 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
150	2:30 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
165	2:45 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
180	3:00 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
195	3:15 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
210	3:30 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
225	3:45 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
240	4:00 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
255	4:15 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
270	4:30 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
285	4:45 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open	
300	5:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	
315	5:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	
330	5:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	
345	5:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	
360	6:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	
375	6:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	
390	6:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	
405	6:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	
420	7:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open	

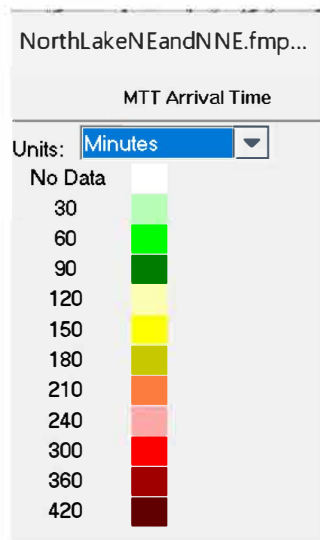




Wind Driven Fire at North Interface (Wind NE direction @ 70 mph) with Creek Avoidance Development

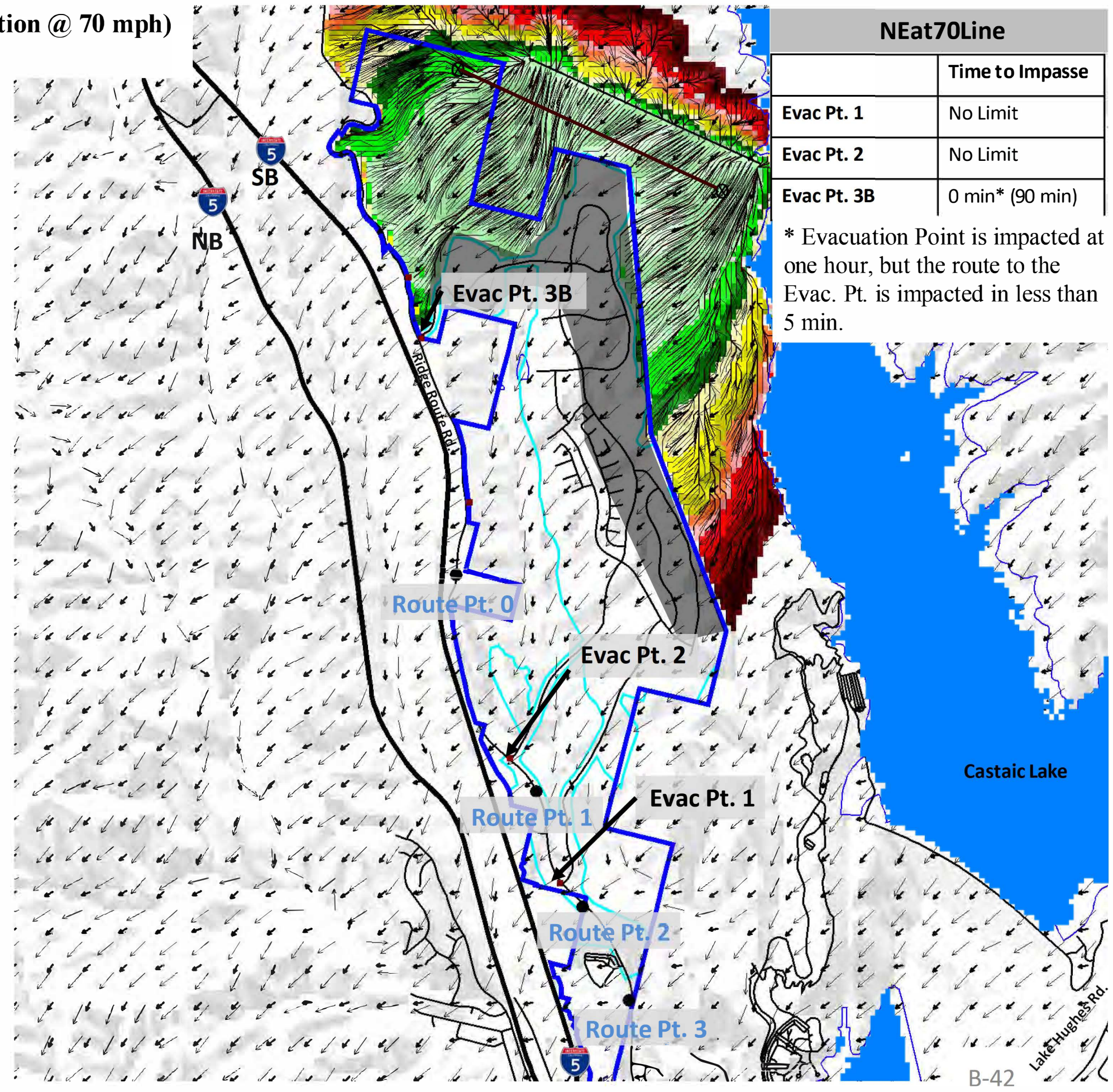
This fire with 70 mph winds (sustained) shows the timing from the fire as it interfaces with the proposed community.

The fire was not made to spot over the freeways and start again as the wind direction will not take the fire in the direction of the development.



- Streets
- Project Boundary
- Freeway
- Development Area
- Route Fire Perimeter
- Evacuation Point
- Route Point
- Area of Population at Immediate Risk
- Wind Direction
- Spread Direction
- Fire Flow Path
- Origin of the Fire
- Spot Fire

NE wind at 70 Line



NEat70Line	
	Time to Impasse
Evac Pt. 1	No Limit
Evac Pt. 2	No Limit
Evac Pt. 3B	0 min* (90 min)

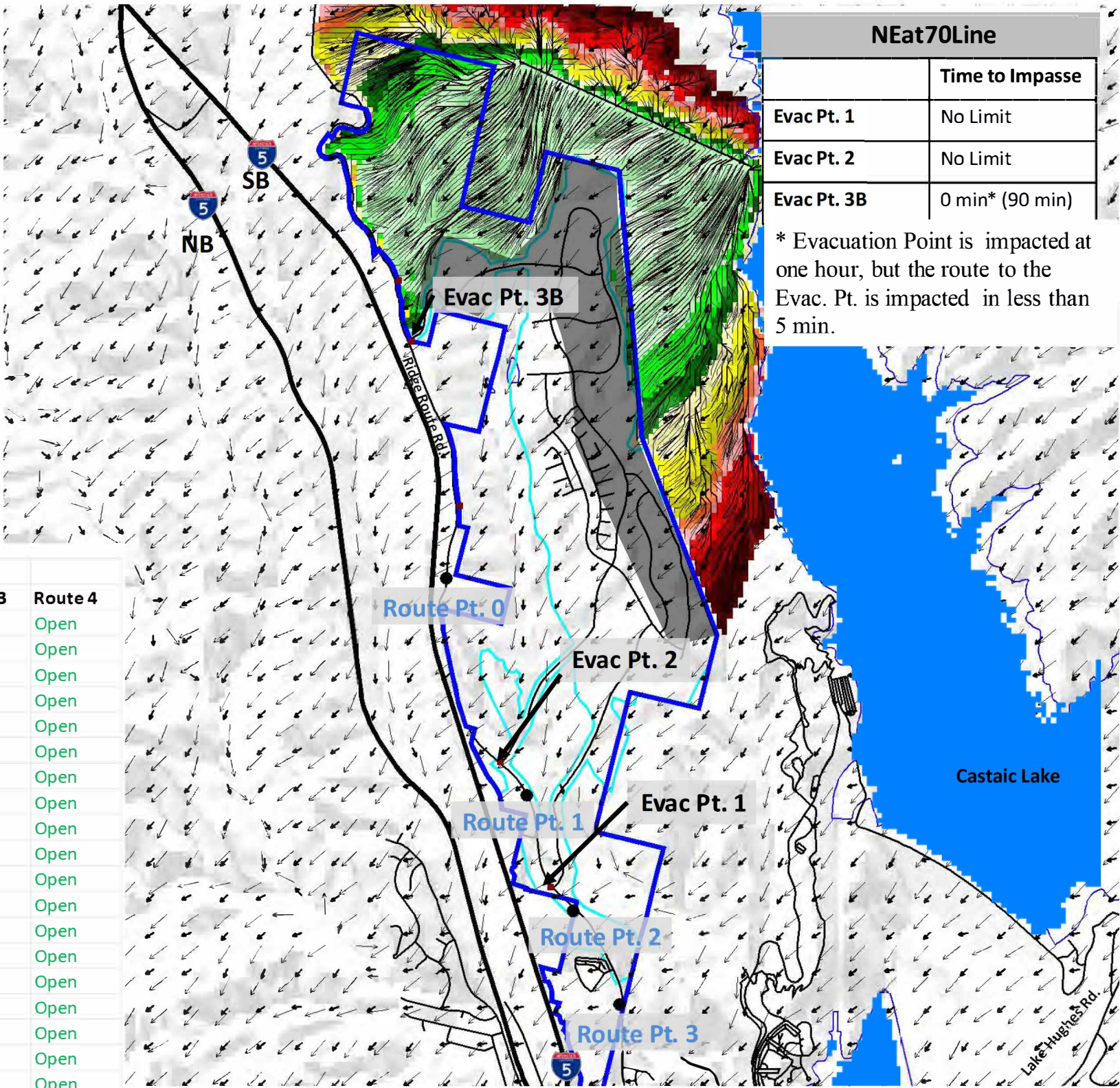
\* Evacuation Point is impacted at one hour, but the route to the Evac. Pt. is impacted in less than 5 min.



Wind Driven Fire at North Interface (Wind NE direction @ 70 mph) with Creek Avoidance Development

Narrative: Fire is modeled from an existing line of fire to the NE of the Project Site. Wind is from the NE at 70 mph. Fire impact the Project Site in less than 5 minutes if the fire has progressed to this point. Fire continues to burn south along the eastern edge of the Project Site. Fire may spot across the freeway but will not impact the evacuation points or route points if it did so if was not modeled.

NE at 70 mph Creek Avoidance		Evacuation to the South								
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15 Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
30	0:30 Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
45	0:45 Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
60	1:00 Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
75	1:15 Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
90	1:30 Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
105	1:45 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
120	2:00 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
135	2:15 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
150	2:30 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
165	2:45 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
180	3:00 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
195	3:15 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
210	3:30 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
225	3:45 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
240	4:00 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
255	4:15 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
270	4:30 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
285	4:45 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
300	5:00 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
315	5:15 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
330	5:30 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
345	5:45 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
360	6:00 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
375	6:15 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
390	6:30 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
405	6:45 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
420	7:00 Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open

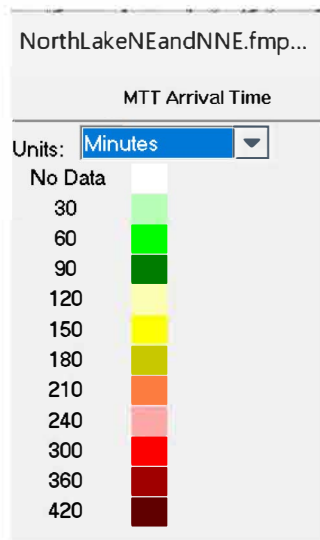




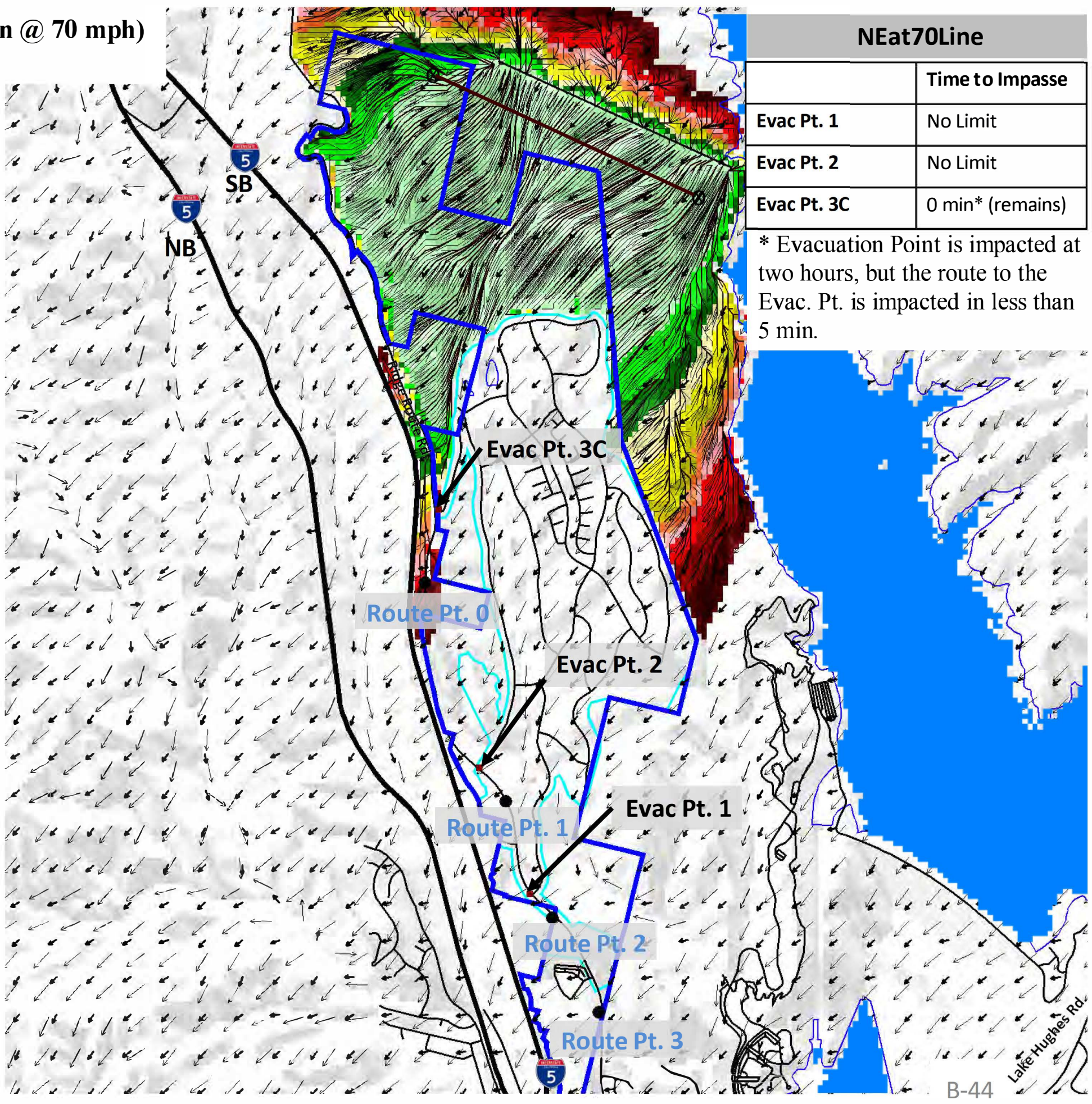
Wind Driven Fire at North Interface (Wind NE direction @ 70 mph) with Partial Creek Avoidance Development

This fire with 70 mph winds (sustained) shows the timing from the fire as it interfaces with the proposed community.

The fire was not made to spot over the freeways and start again as the wind direction will not take the fire in the direction of the development.



- Streets
- Project Boundary
- Freeway
- Development Area
- Route Fire Perimeter
- Evacuation Point
- Route Point
- Area of Population at Immediate Risk
- Wind Direction
- Spread Direction
- Fire Flow Path
- Origin of the Fire
- Spot Fire



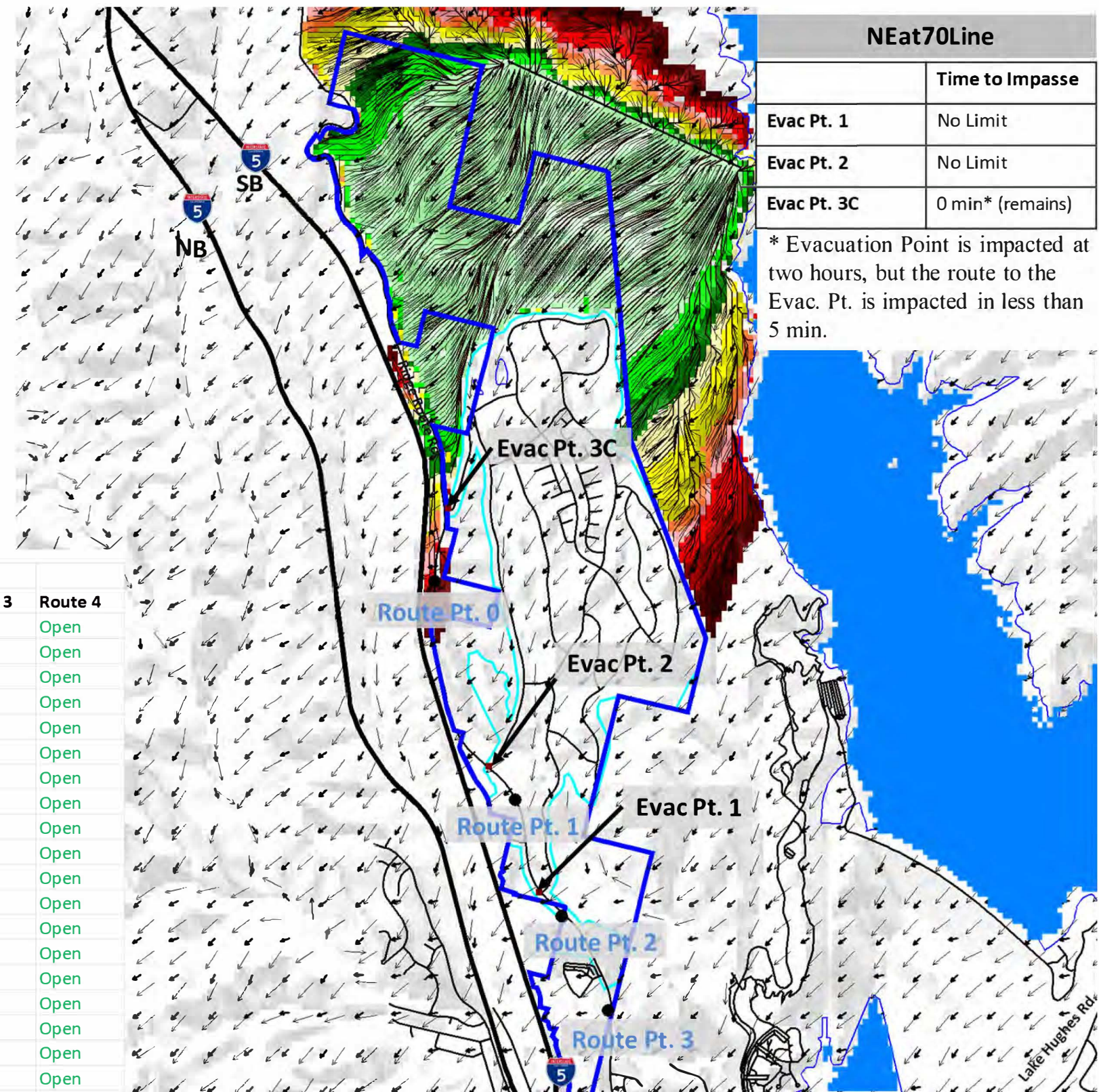
NE wind at 70 Line



Wind Driven Fire at North Interface (Wind NE direction @ 70 mph) with Partial Creek Avoidance Development

Narrative: Fire is modeled from an existing line of fire to the NE of the Project Site. Wind is from the NE at 70 mph. Fire impact the Project Site in less than 5 minutes if the fire has progressed to this point. Fire continues to burn south along the eastern edge of the Project Site. Fire may spot across the freeway but will not impact the evacuation points or route points if it did so if was not modeled. Fire will continue to burn south on the west side of the Project Site (out of alignment) for the balance of the modeling timeframe.

NE at 70 mphParital Creek Avoidance		Evacuation to the South								
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
30	0:30 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
45	0:45 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
60	1:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
75	1:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
90	1:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
105	1:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
120	2:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
135	2:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
150	2:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
165	2:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
180	3:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
195	3:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
210	3:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
225	3:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
240	4:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
255	4:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
270	4:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
285	4:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
300	5:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
315	5:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
330	5:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
345	5:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
360	6:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
375	6:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
390	6:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
405	6:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
420	7:00 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open

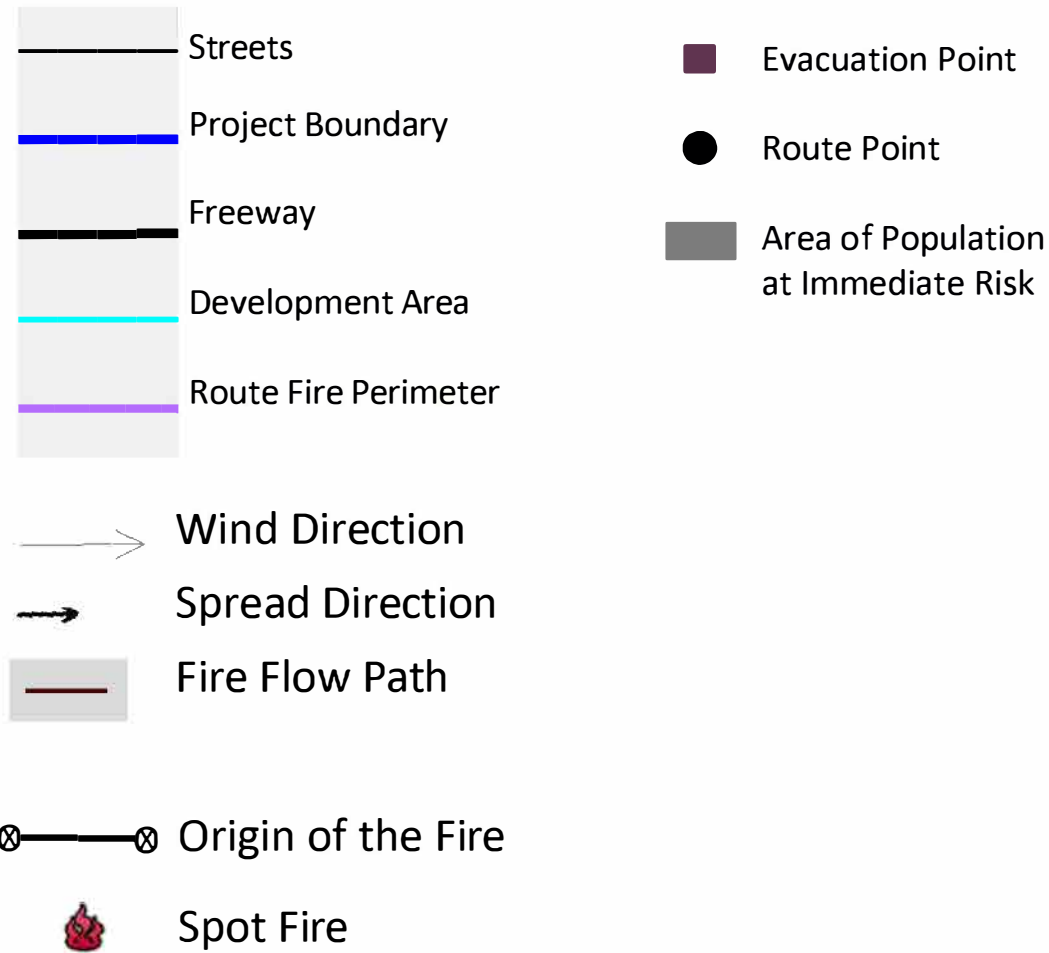
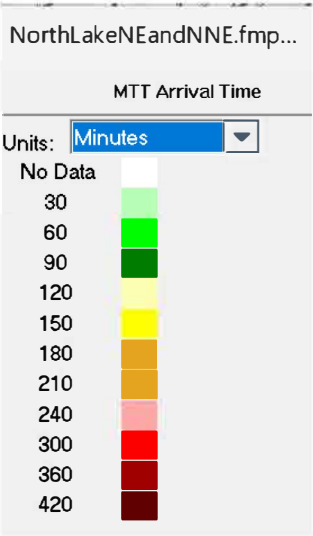




Wind Driven Fire at North Interface (Wind NNE direction @ 70 mph) with Previously Approved Development

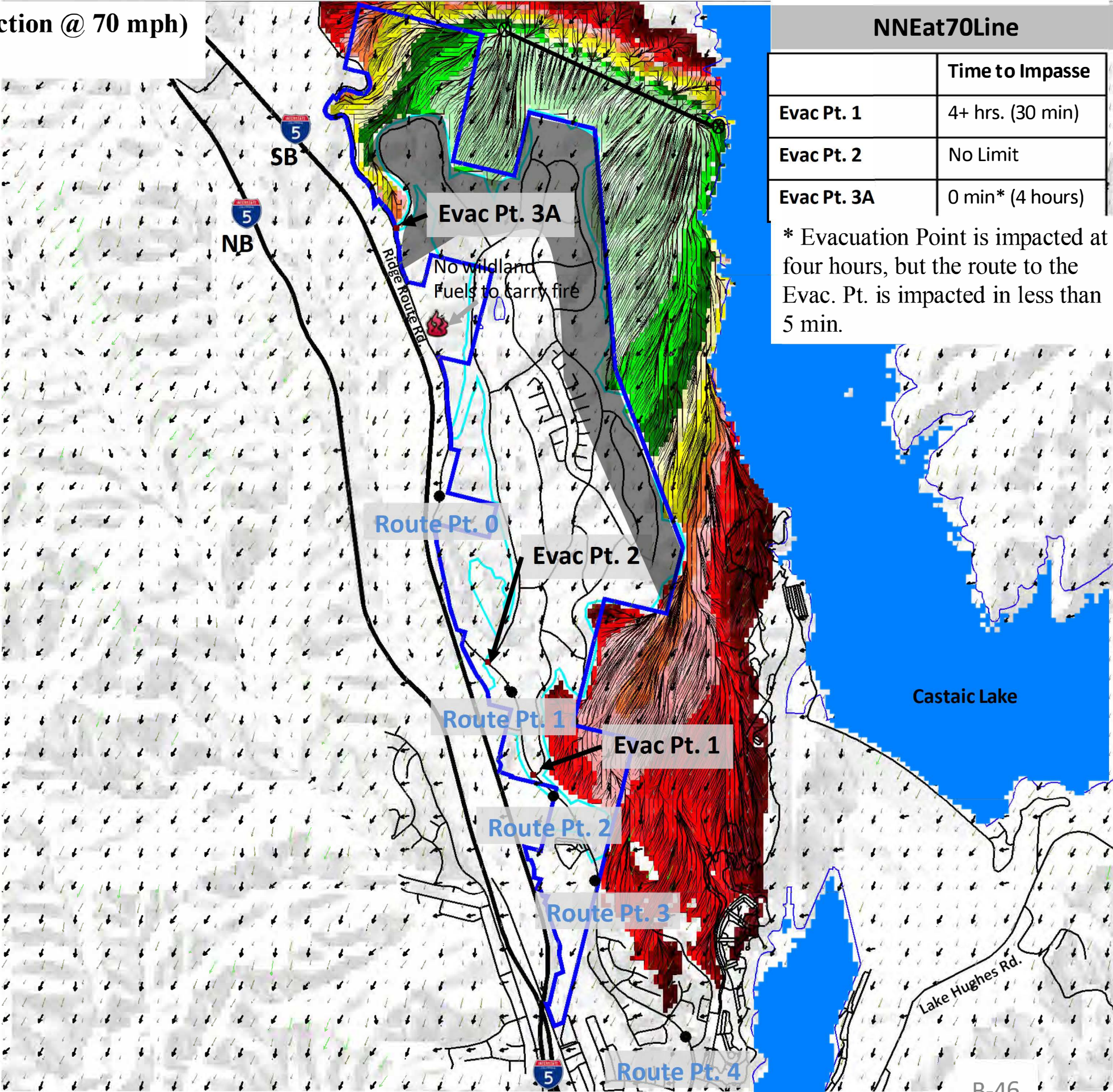
This fire with 70 mph winds (sustained) shows the timing from the fire as it interfaces with the proposed community.

The change in alignment allows the fire to move more quickly on the east flank.



Origin to first spot 30 min.

NNE wind at 70 Line

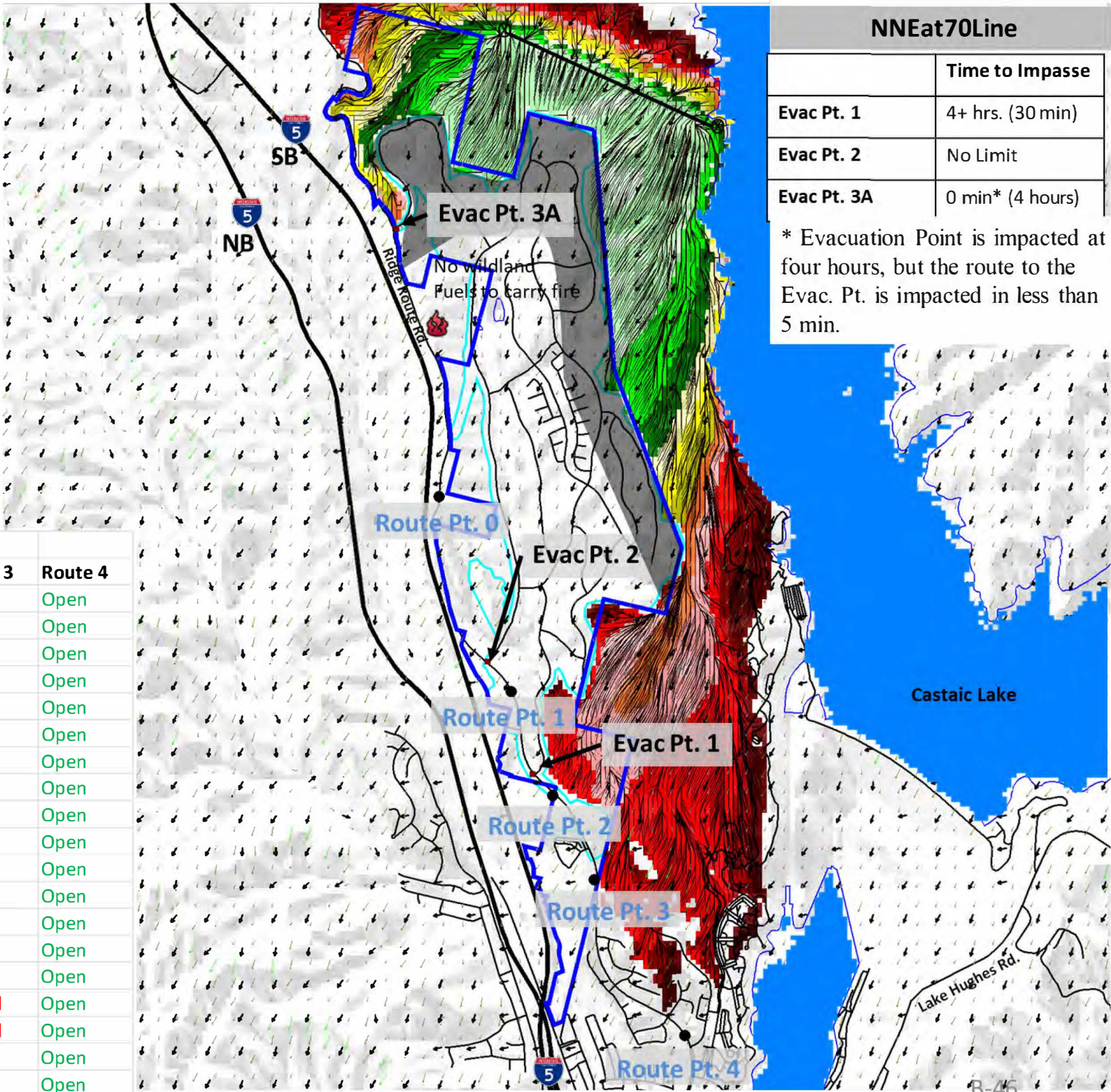




Wind Driven Fire at North Interface (Wind NNE direction @ 70 mph) with Previously Approved Development

Narrative: Fire is modeled from an existing line of fire to the NE of the Project Site. Wind is from the NNE at 70 mph. Fire impact the Project Site in less than 5 minutes if the fire has progressed to this point. Fire continues to burn south along the eastern edge of the Project Site. Fire may spot across the freeway but will not impact the evacuation points or route points if it did so if was not modeled. Fire will eventually impact Ridge Route to the south and close all evacuations for a period of 30-60 min. This will occur approximately four hours into the simulated event.

NNE at 70 mph Approved		Evacuation to the South									
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
30	0:30	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
45	0:45	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
60	1:00	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
75	1:15	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
90	1:30	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
105	1:45	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
120	2:00	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
135	2:15	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
150	2:30	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
165	2:45	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
180	3:00	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
195	3:15	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
210	3:30	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
225	3:45	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
240	4:00	Closed	Open	Closed	n/a	n/a	Open	Open	Closed	Closed	Open
255	4:15	Closed	Open	Open	n/a	n/a	Open	Open	Closed	Closed	Open
270	4:30	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
285	4:45	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
300	5:00	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
315	5:15	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
330	5:30	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
345	5:45	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
360	6:00	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
375	6:15	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
390	6:30	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
405	6:45	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
420	7:00	Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open





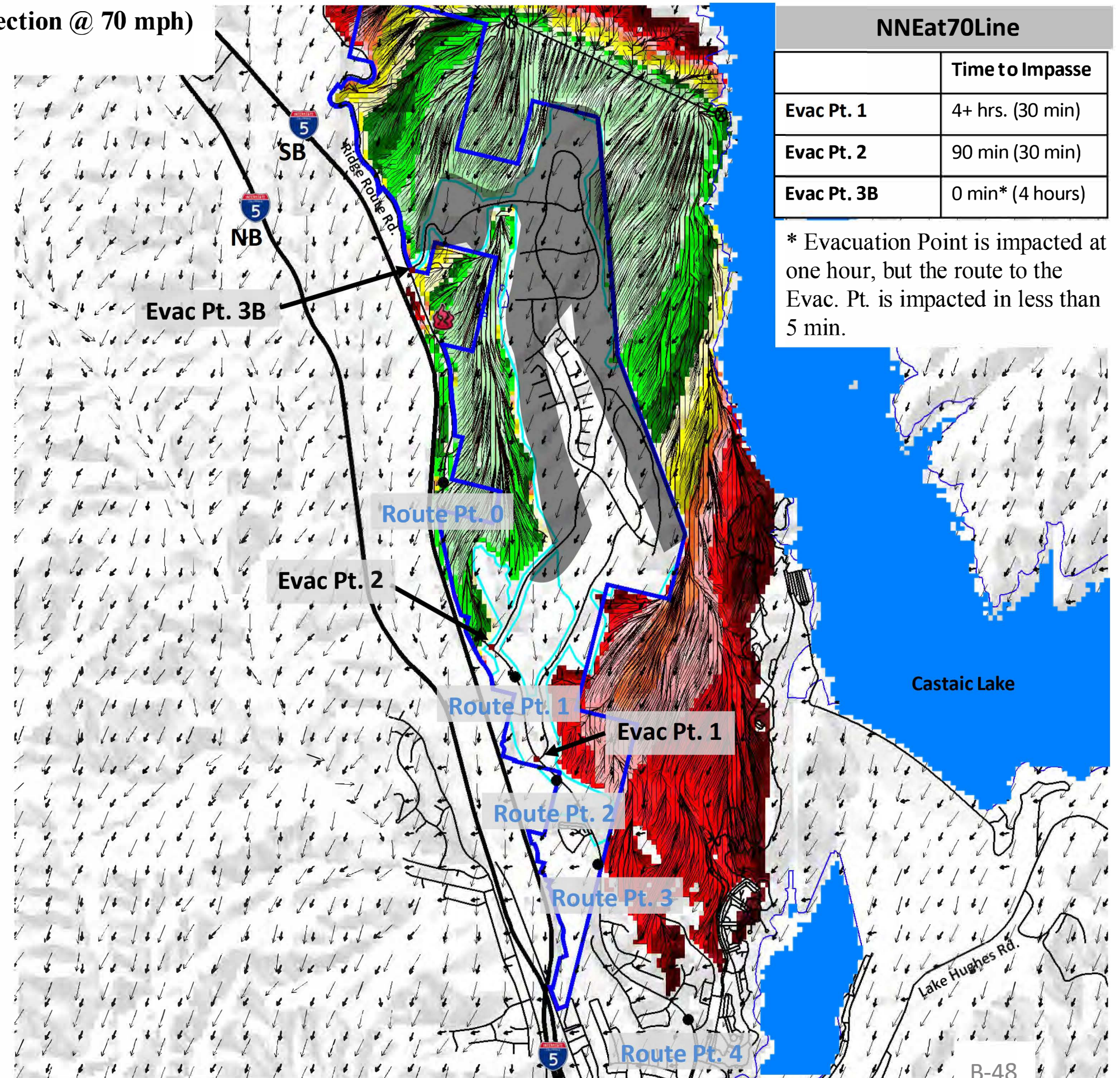
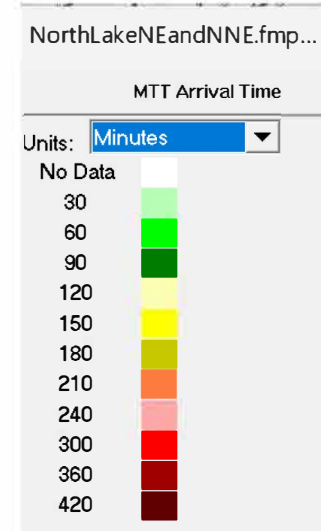
## Wind Driven Fire at North Interface (Wind NNE direction @ 70 mph) with Creek Avoidance Development

This fire with 70 mph winds (sustained) shows the timing from the fire as it interfaces with the proposed community.

The change in alignment allows the fire to move more quickly on the east flank.



## NNE wind at 70 Line

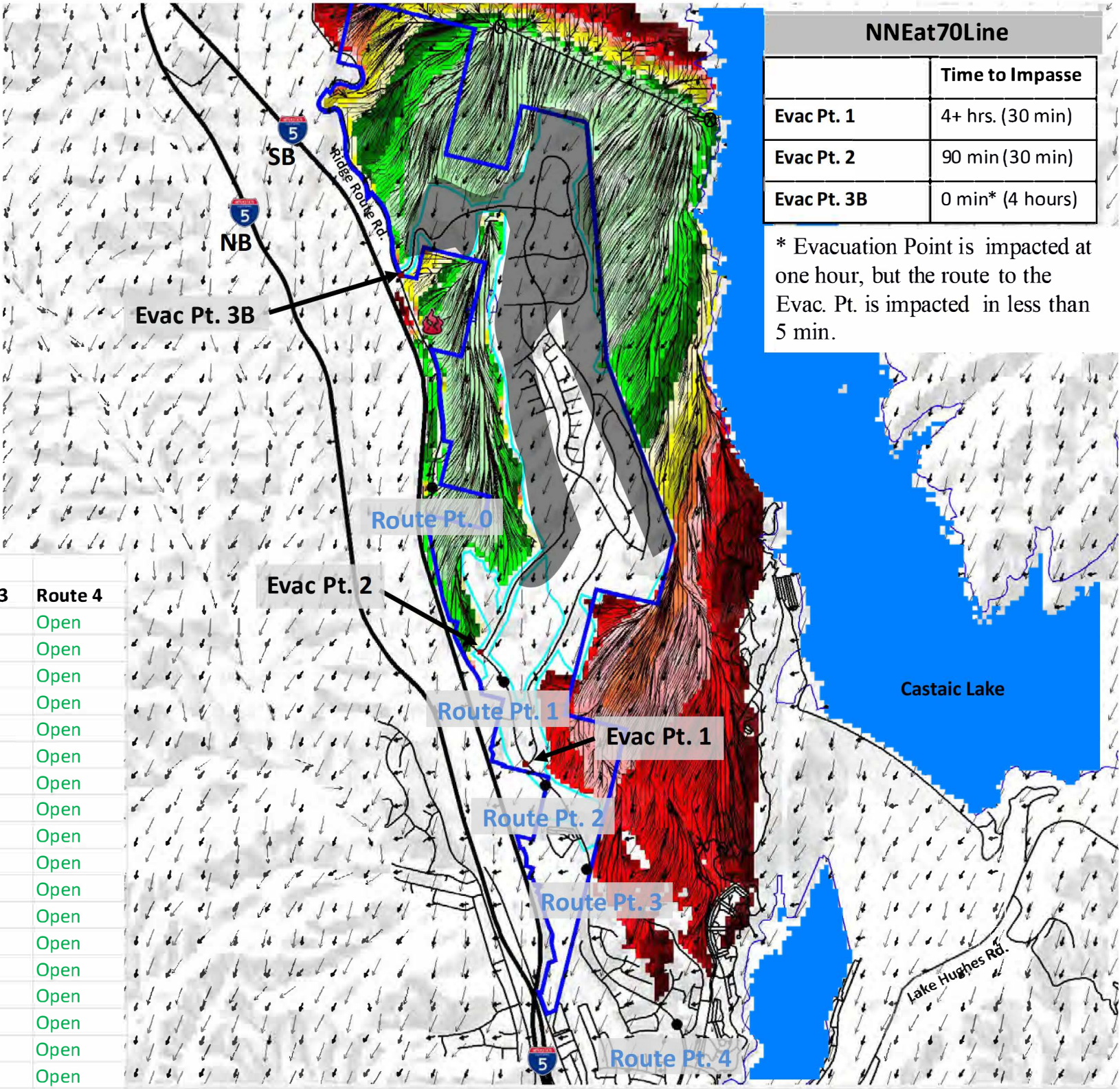




Wind Driven Fire at North Interface (Wind NNE direction @ 70 mph) with Creek Avoidance Development

Narrative: Fire is modeled from an existing line of fire to the NE of the Project Site. Wind is from the NNE at 70 mph. Fire impact the Project Site in less than 5 minutes if the fire has progressed to this point. Fire continues to burn south along the eastern edge of the Project Site. Fire may spot across the freeway but will not impact the evacuation points or route points if it did so if was not modeled. Fire will continue to burn south on the west side of the Project Site down to Evac Pt. 2. Fire will eventually impact Ridge Route to the south and close all evacuations for a period of 30-60 min. This will occur approximately four hours into the simulated event.

NNE at 70 mph Creek Avoidance		Evacuation to the South									
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
30	0:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
45	0:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
60	1:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
75	1:15	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
90	1:30	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
105	1:45	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
120	2:00	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
135	2:15	Open	Open	n/a	Closed	n/a	Closed	Open	Open	Open	Open
150	2:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
165	2:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
180	3:00	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
195	3:15	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
210	3:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
225	3:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
240	4:00	Closed	Open	n/a	Closed	n/a	Open	Open	Closed	Closed	Open
255	4:15	Closed	Open	n/a	Open	n/a	Open	Open	Closed	Closed	Open
270	4:30	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
285	4:45	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
300	5:00	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
315	5:15	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
330	5:30	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
345	5:45	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
360	6:00	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
375	6:15	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
390	6:30	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
405	6:45	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open
420	7:00	Open	Open	n/a	Open	n/a	Open	Open	Open	Open	Open

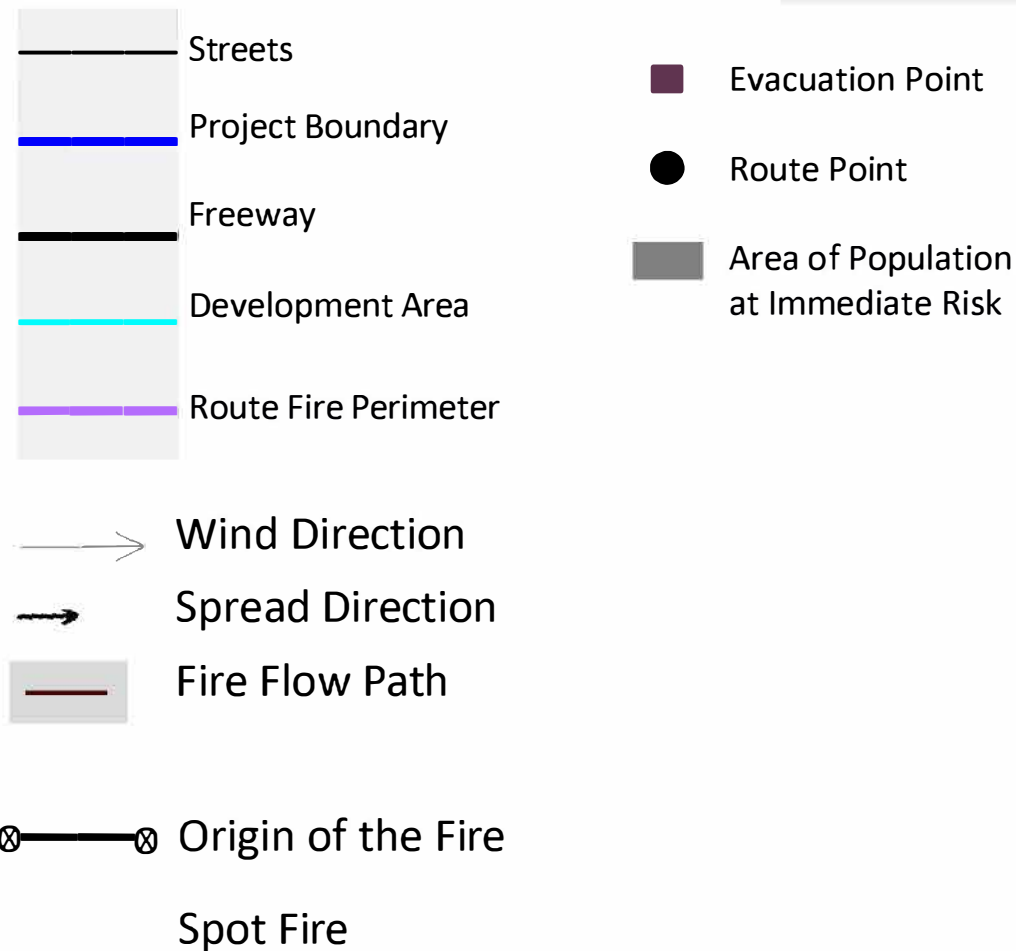




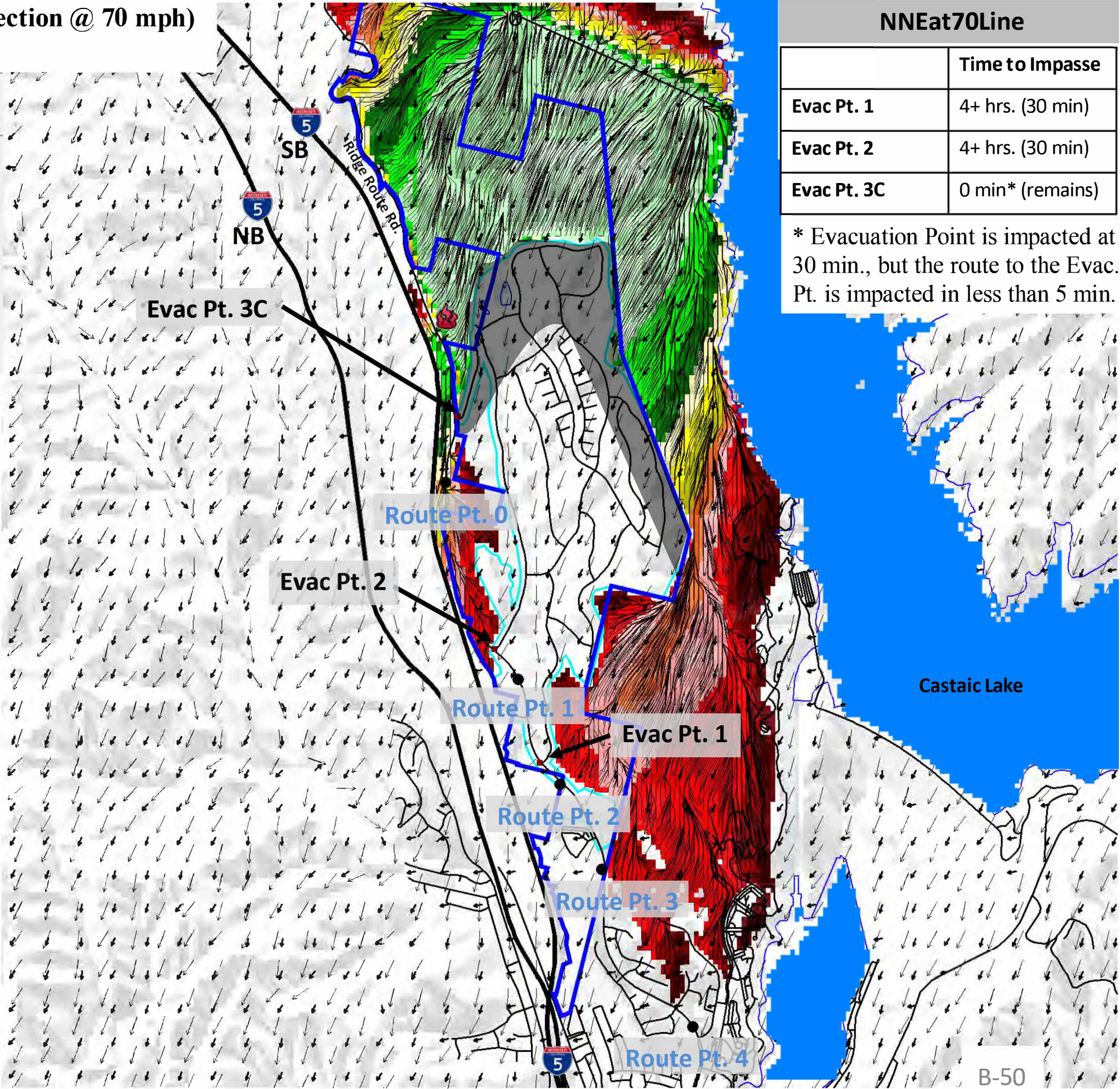
Wind Driven Fire at North Interface (Wind NNE direction @ 70 mph) with Partial Creek Avoidance Development

This fire with 70 mph winds (sustained) shows the timing from the fire as it interfaces with the proposed community.

The change in alignment allows the fire to move more quickly on the east flank.



NNE wind at 70 Line



NNEat70Line	
	Time to Impasse
Evac Pt. 1	4+ hrs. (30 min)
Evac Pt. 2	4+ hrs. (30 min)
Evac Pt. 3C	0 min* (remains)

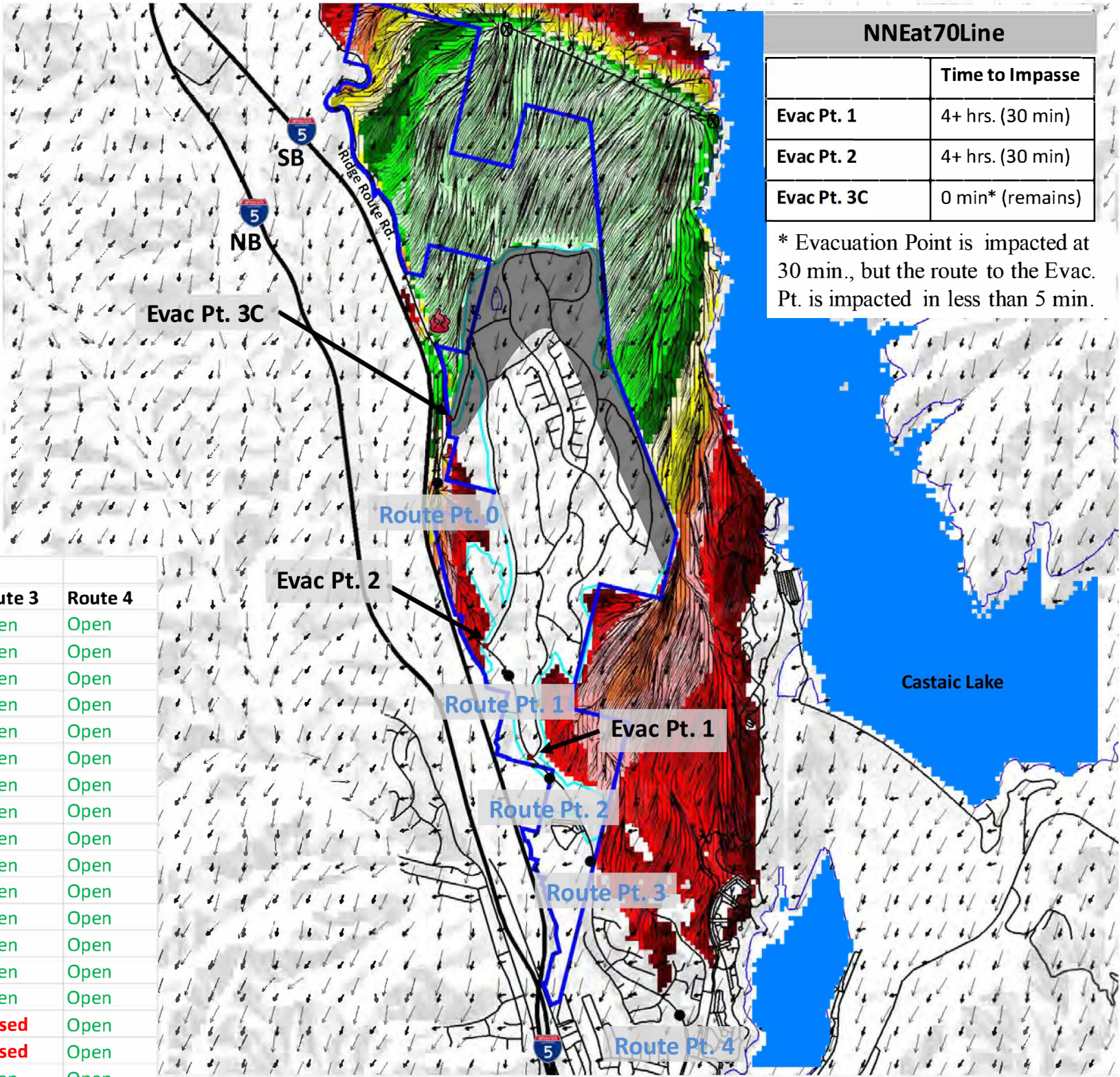
\* Evacuation Point is impacted at 30 min., but the route to the Evac. Pt. is impacted in less than 5 min.



Wind Driven Fire at North Interface (Wind NNE direction @ 70 mph) with Partial Creek Avoidance Development

Narrative: Fire is modeled from an existing line of fire to the NE of the Project Site. Wind is from the NNE at 70 mph. Fire impact the Project Site in less than 5 minutes if the fire has progressed to this point. Fire continues to burn south along the eastern edge of the Project Site. Fire may spot across the freeway but will not impact the evacuation points or route points if it did so if was not modeled. Fire will continue to burn south on the west side of the Project Site down to Evac Pt. 2. Fire will eventually impact Ridge Route to the south and close all evacuations for a period of 30-60 min. This will occur approximately four hours into the simulated event.

	NNE at 70 mphParital Creek Avoidance		Evacuation to the South		Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B						
15	0:15 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
30	0:30 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
45	0:45 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
60	1:00 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
75	1:15 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
90	1:30 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
105	1:45 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
120	2:00 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
135	2:15 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
150	2:30 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
165	2:45 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
180	3:00 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
195	3:15 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
210	3:30 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
225	3:45 Open	Open	n/a	n/a	Closed	Closed	Open	Open	Open	Open
240	4:00 Closed	Open	n/a	n/a	Closed	Open	Open	Closed	Closed	Open
255	4:15 Closed	Open	n/a	n/a	Closed	Open	Open	Closed	Closed	Open
270	4:30 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
285	4:45 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
300	5:00 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
315	5:15 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
330	5:30 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
345	5:45 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
360	6:00 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
375	6:15 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
390	6:30 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
405	6:45 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
420	7:00 Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open



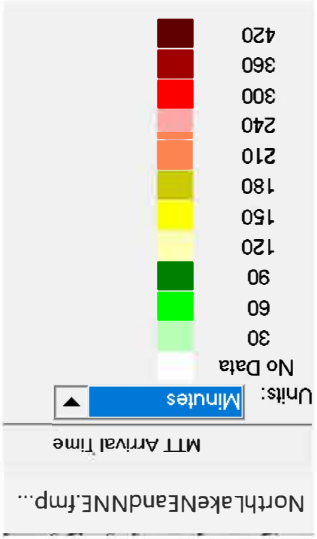


Wind Driven Fire at North Interface (Wind N direction @ 70 mph)

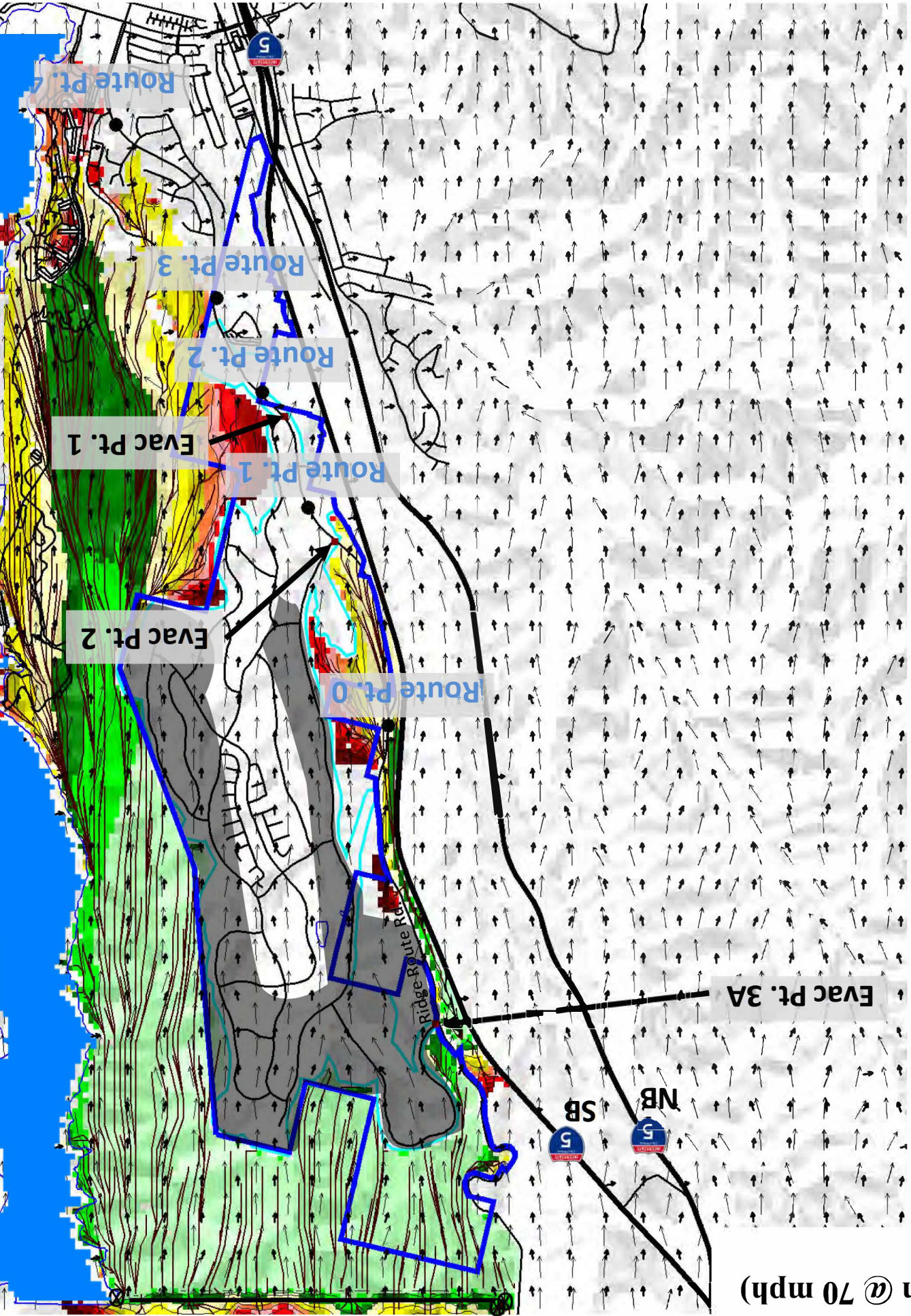
with Previously Approved Development

This fire with 70 mph winds (sustained) shows the timing from the fire as it interfaces with the proposed community.

The change in alignment allows the fire to run dramatically on the west and east flanks.



Origin to first spot 30 min.  
First spot to second spot 30 min  
N wind at 70 Line



Nat70Line			
Time to Impasse	Evac Pt. 1	Evac Pt. 2	Evac Pt. 3A
4+ hrs.		90 min (30)	0 min* (remains)

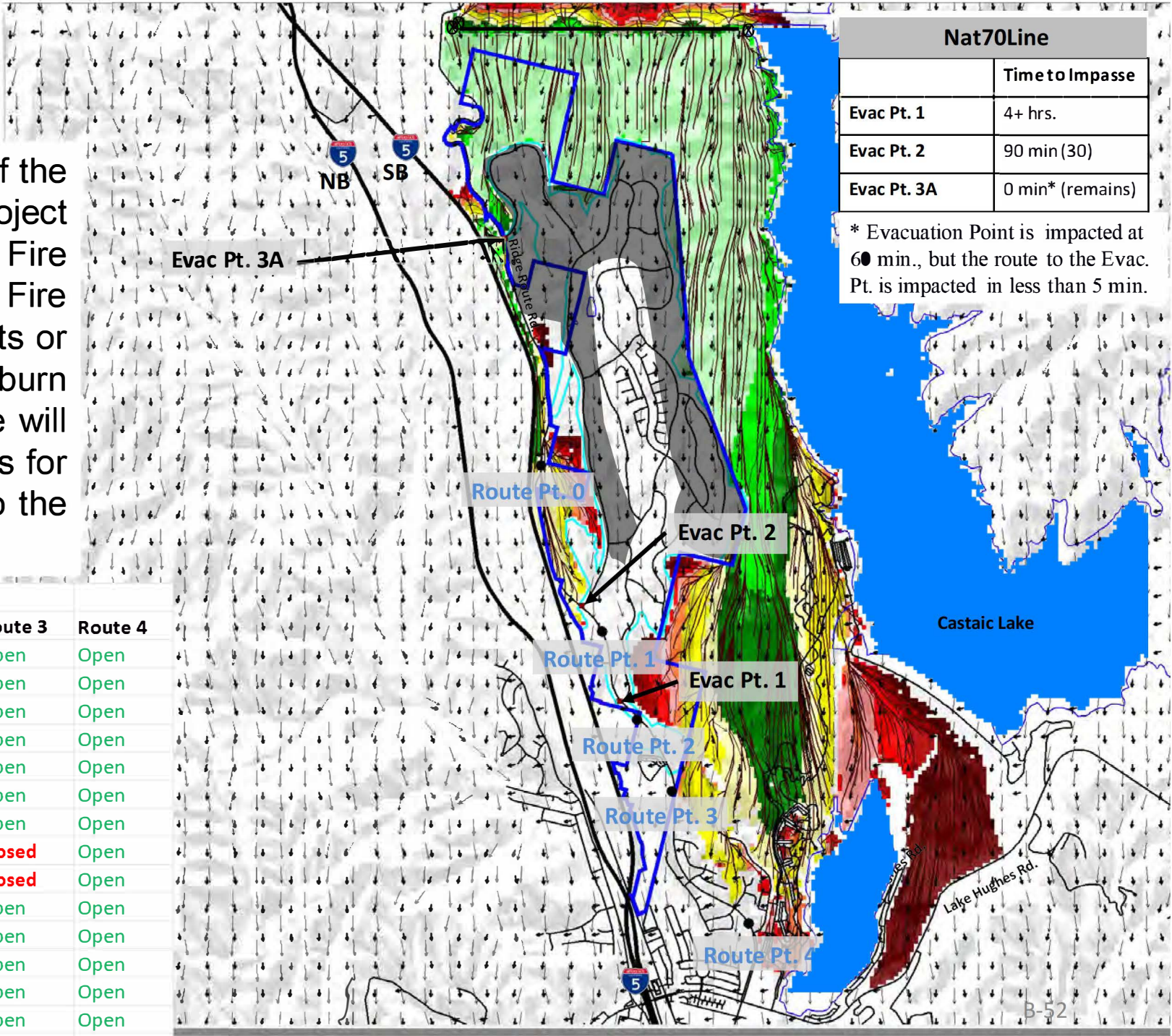
\* Evacuation Point is impacted at 60 min., but the route to the Evac. Pt. is impacted in less than 5 min.



Wind Driven Fire at North Interface (Wind N direction @ 70 mph) with Previously Approved Development

Narrative: Fire is modeled from an existing line of fire to the North of the Project Site. Wind is from the North at 70 mph. Fire impact the Project Site in less than 5 minutes if the fire has progressed to this point. Fire continues to burn south along the eastern edge of the Project Site. Fire may spot across the freeway but will not impact the evacuation points or route points if it did so if was not modeled. Fire will continue to burn south on the west side of the Project Site down to Evac Pt. 2. Fire will eventually impact Ridge Route to the south and close all evacuations for a period of 30-60 min. This will occur approximately two hours into the simulated event and again at approximately four hours.

N at 70 mph Approved		Evacuation to the South									
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
30	0:30	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
45	0:45	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
60	1:00	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
75	1:15	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
90	1:30	Open	Closed	Closed	n/a	n/a	Closed	Open	Open	Open	Open
105	1:45	Open	Closed	Closed	n/a	n/a	Closed	Open	Open	Open	Open
120	2:00	Open	Open	Closed	n/a	n/a	Open	Open	Open	Closed	Open
135	2:15	Open	Open	Closed	n/a	n/a	Open	Open	Open	Closed	Open
150	2:30	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
165	2:45	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
180	3:00	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
195	3:15	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
210	3:30	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
225	3:45	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
240	4:00	Closed	Open	Closed	n/a	n/a	Open	Open	Closed	Open	Closed
255	4:15	Closed	Open	Closed	n/a	n/a	Open	Open	Closed	Open	Closed
270	4:30	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
285	4:45	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
300	5:00	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
315	5:15	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
330	5:30	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
345	5:45	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
360	6:00	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
375	6:15	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
390	6:30	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
405	6:45	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
420	7:00	Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open

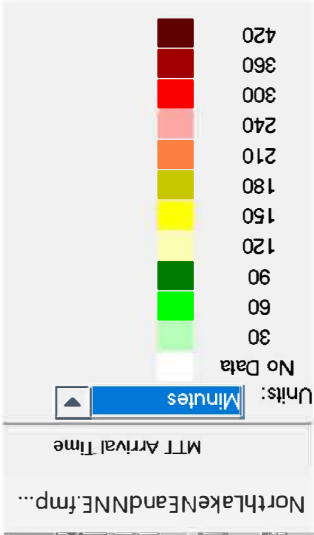




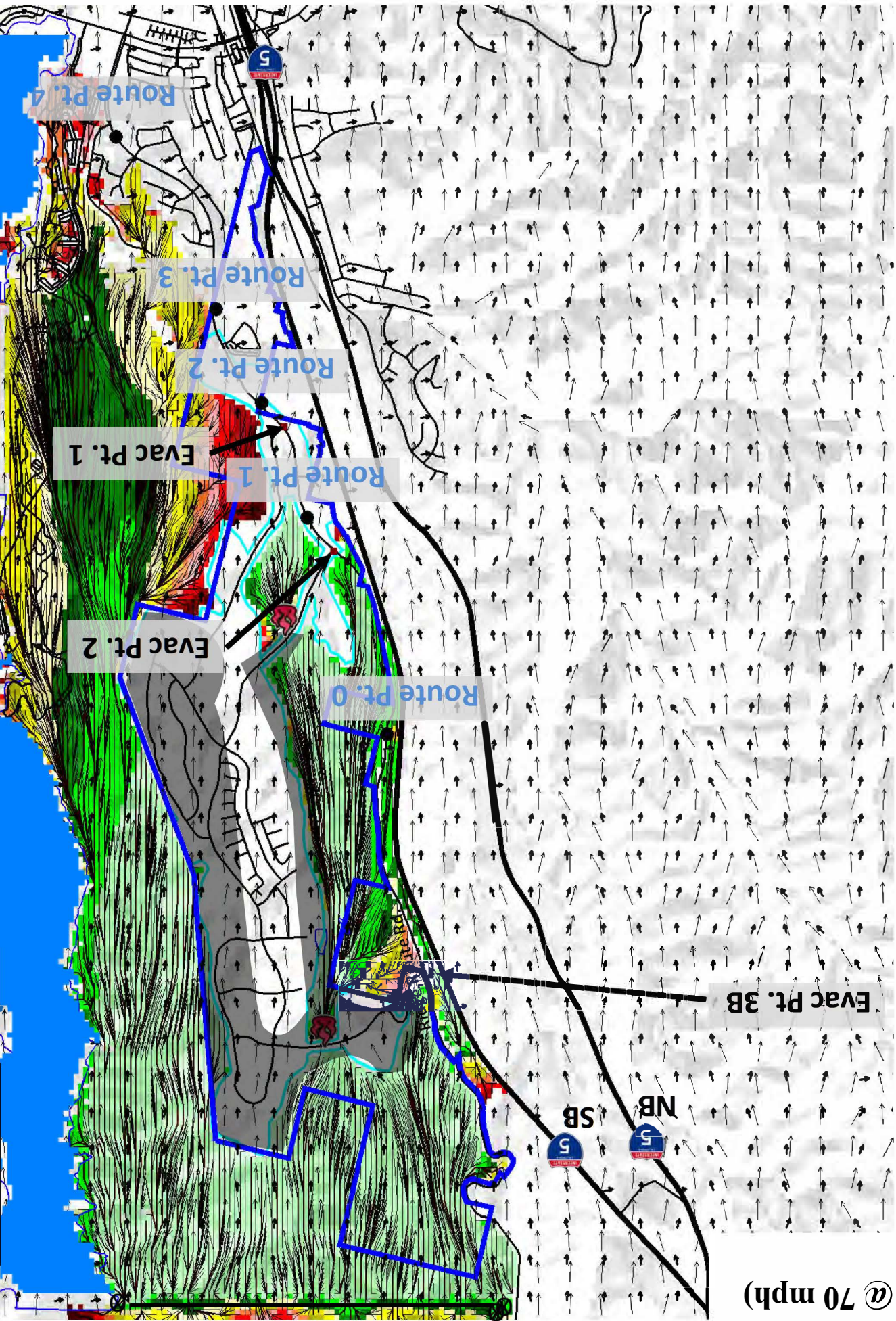
Wind Driven Fire at North Interface (Wind N direction @ 70 mph)

This fire with 70 mph winds (sustained) shows the timing from the fire as it interfaces with the proposed community.

The change in alignment allows the fire to run dramatically on the west and east flanks.



Origin to first spot 30 min.  
First spot to second spot 30 min  
N wind at 70 line



Nat70line			
Time to Impasse	Evac Pt. 1	Evac Pt. 2	Evac Pt. 3B
4+ hrs.		60 min (30 min)	0 min* (remains)

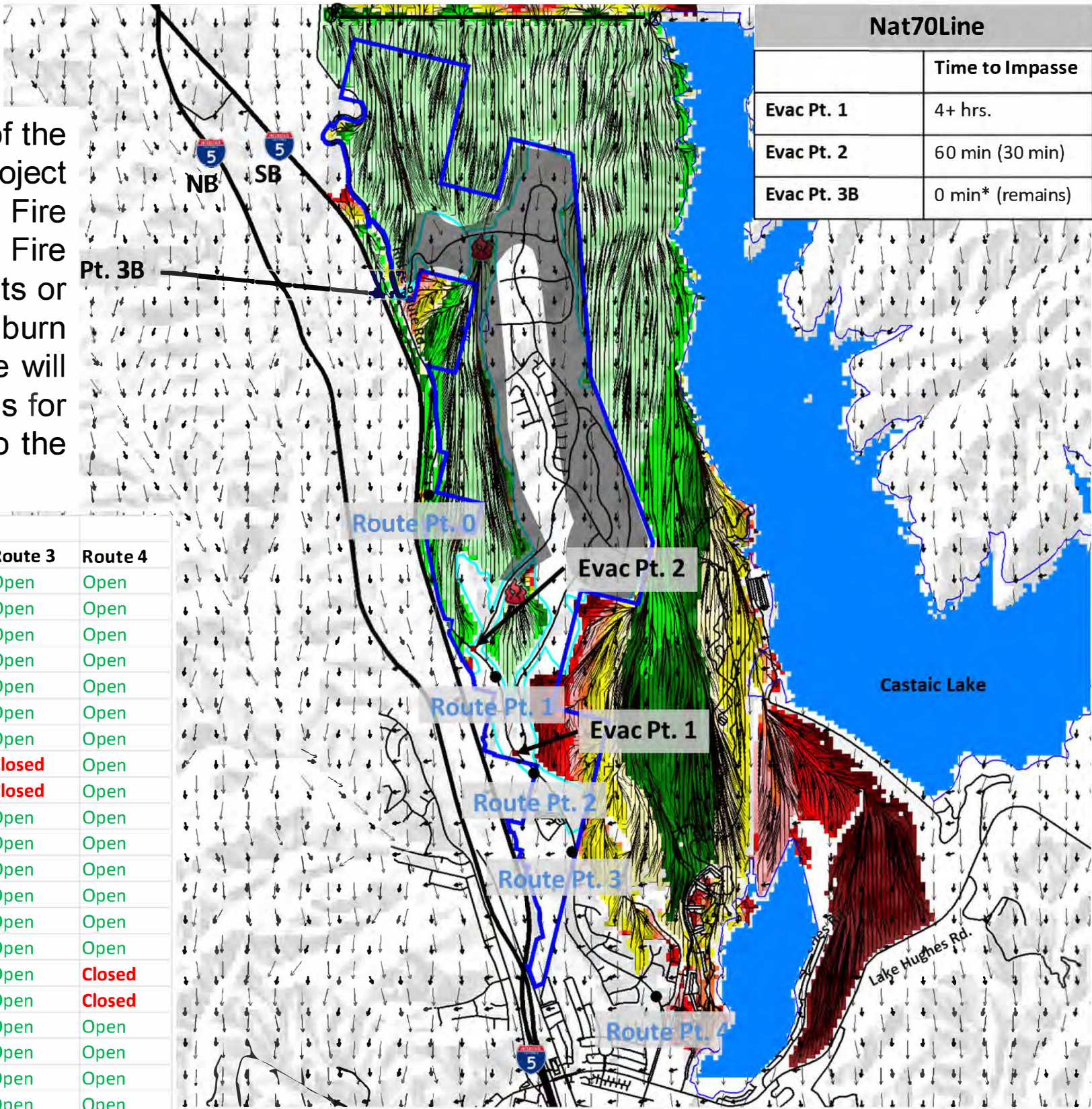
\* Evacuation Point is impacted at 30 min., but the route to the Evac. Pt. is impacted in less than 5 min.



Wind Driven Fire at North Interface (Wind N direction @ 70 mph) with Creek Avoidance Development

Narrative: Fire is modeled from an existing line of fire to the North of the Project Site. Wind is from the North at 70 mph. Fire impact the Project Site in less than 5 minutes if the fire has progressed to this point. Fire continues to burn south along the eastern edge of the Project Site. Fire may spot across the freeway but will not impact the evacuation points or route points if it did so if was not modeled. Fire will continue to burn south on the west side of the Project Site down to Evac Pt. 2. Fire will eventually impact Ridge Route to the south and close all evacuations for a period of 30-60 min. This will occur approximately two hours into the simulated event and again at approximately four hours.

N at 70 mph Creek Avoidance		Evacuation to the South									
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
30	0:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
45	0:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
60	1:00	Open	Closed	n/a	Closed	n/a	Closed	Closed	Open	Open	Open
75	1:15	Open	Closed	n/a	Closed	n/a	Closed	Closed	Open	Open	Open
90	1:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
105	1:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
120	2:00	Open	Open	n/a	Closed	n/a	Open	Open	Open	Closed	Open
135	2:15	Open	Open	n/a	Closed	n/a	Open	Open	Open	Closed	Open
150	2:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
165	2:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
180	3:00	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
195	3:15	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
210	3:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
225	3:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
240	4:00	Closed	Open	n/a	Closed	n/a	Open	Open	Closed	Open	Closed
255	4:15	Closed	Open	n/a	Closed	n/a	Open	Open	Closed	Open	Closed
270	4:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
285	4:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
300	5:00	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
315	5:15	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
330	5:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
345	5:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
360	6:00	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
375	6:15	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
390	6:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
405	6:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
420	7:00	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open



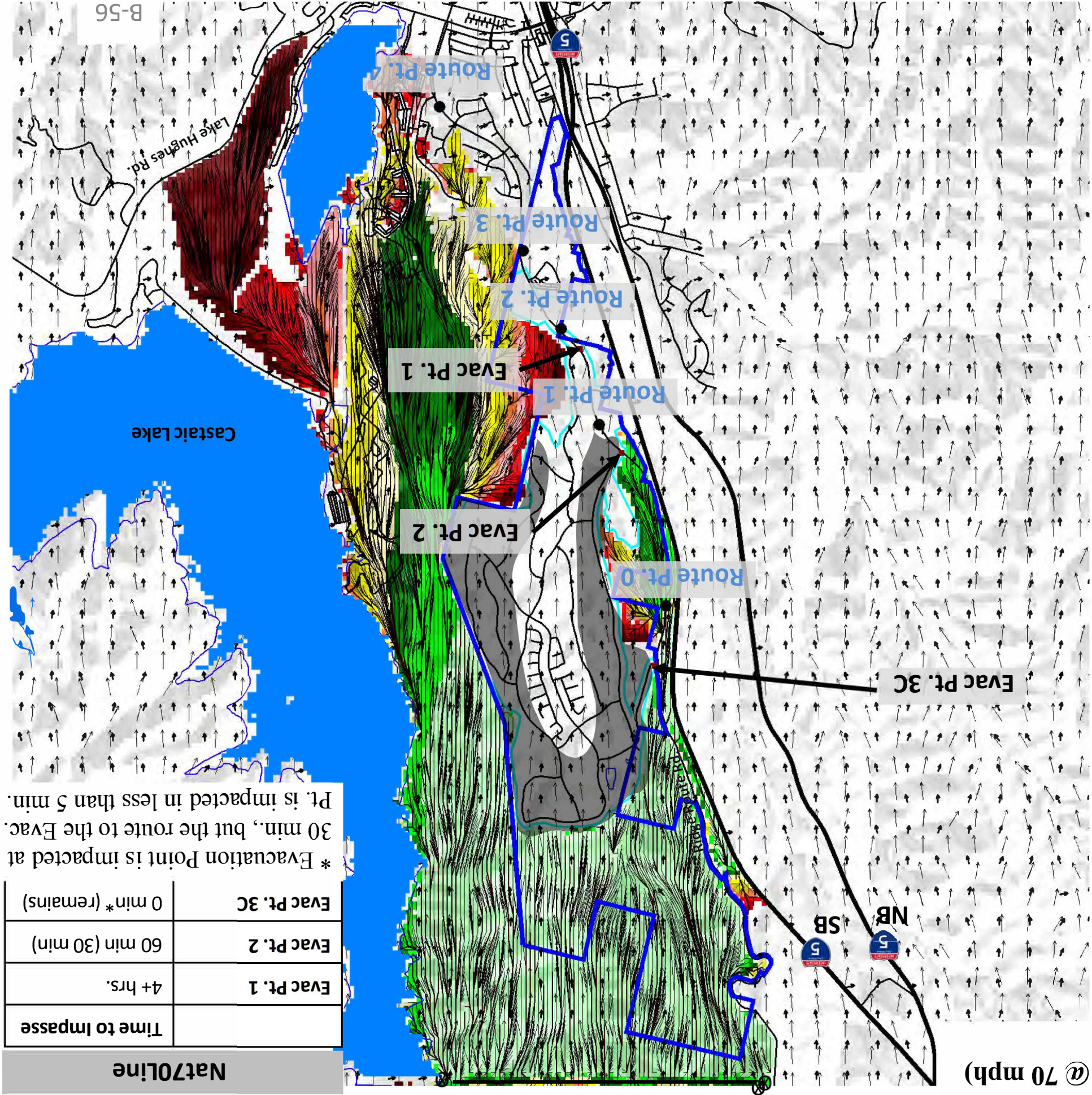
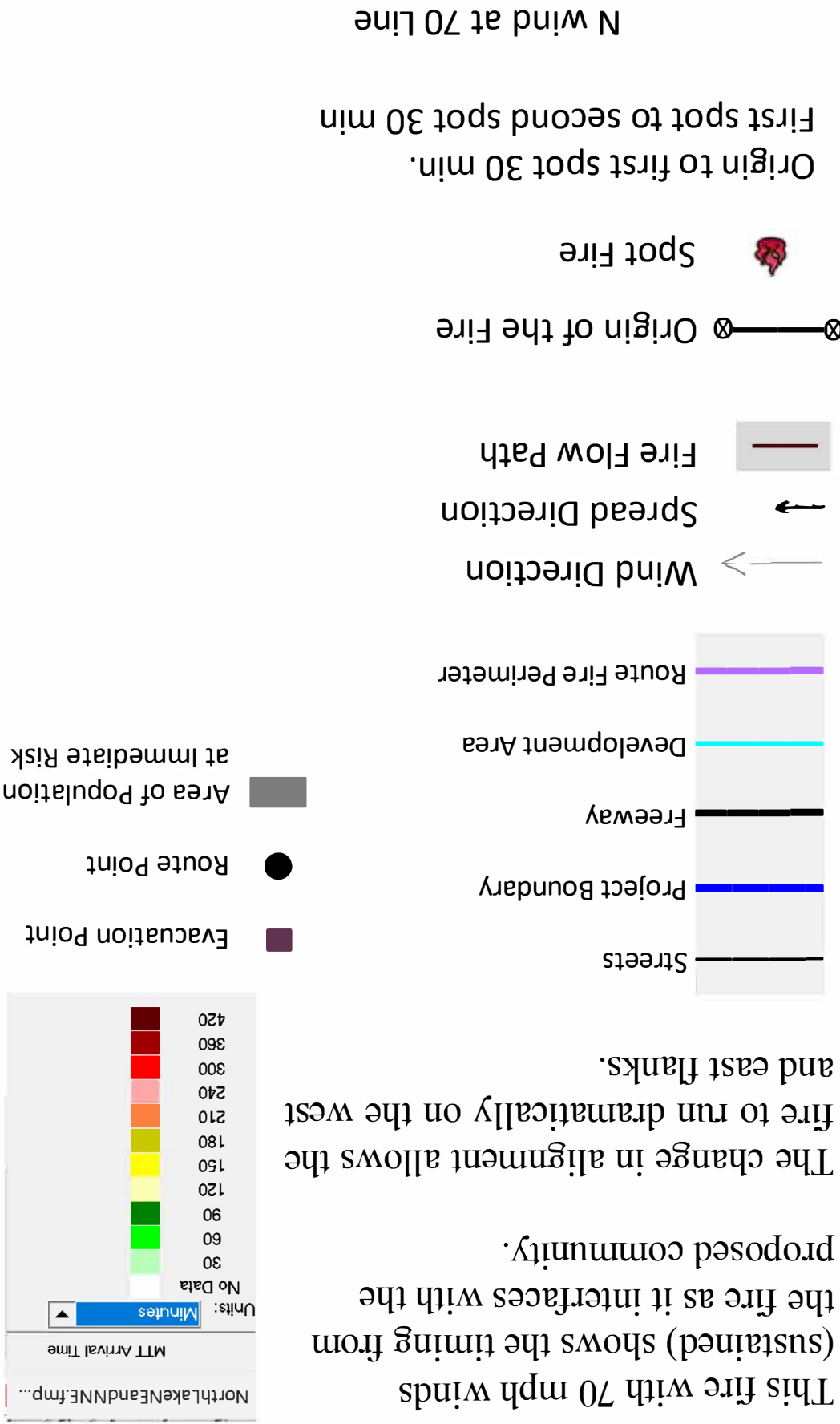


Wind Driven Fire at North Interface (Wind N direction @ 70 mph)

with Partial Creek Avoidance Development

This fire with 70 mph winds (sustained) shows the timing from the fire as it interfaces with the proposed community.

The change in alignment allows the fire to run dramatically on the west and east flanks.



Nat70Line			
Time to Impasse	Evac Pt. 1	Evac Pt. 2	Evac Pt. 3C
4+ hrs.		60 min (30 min)	0 min* (remains)

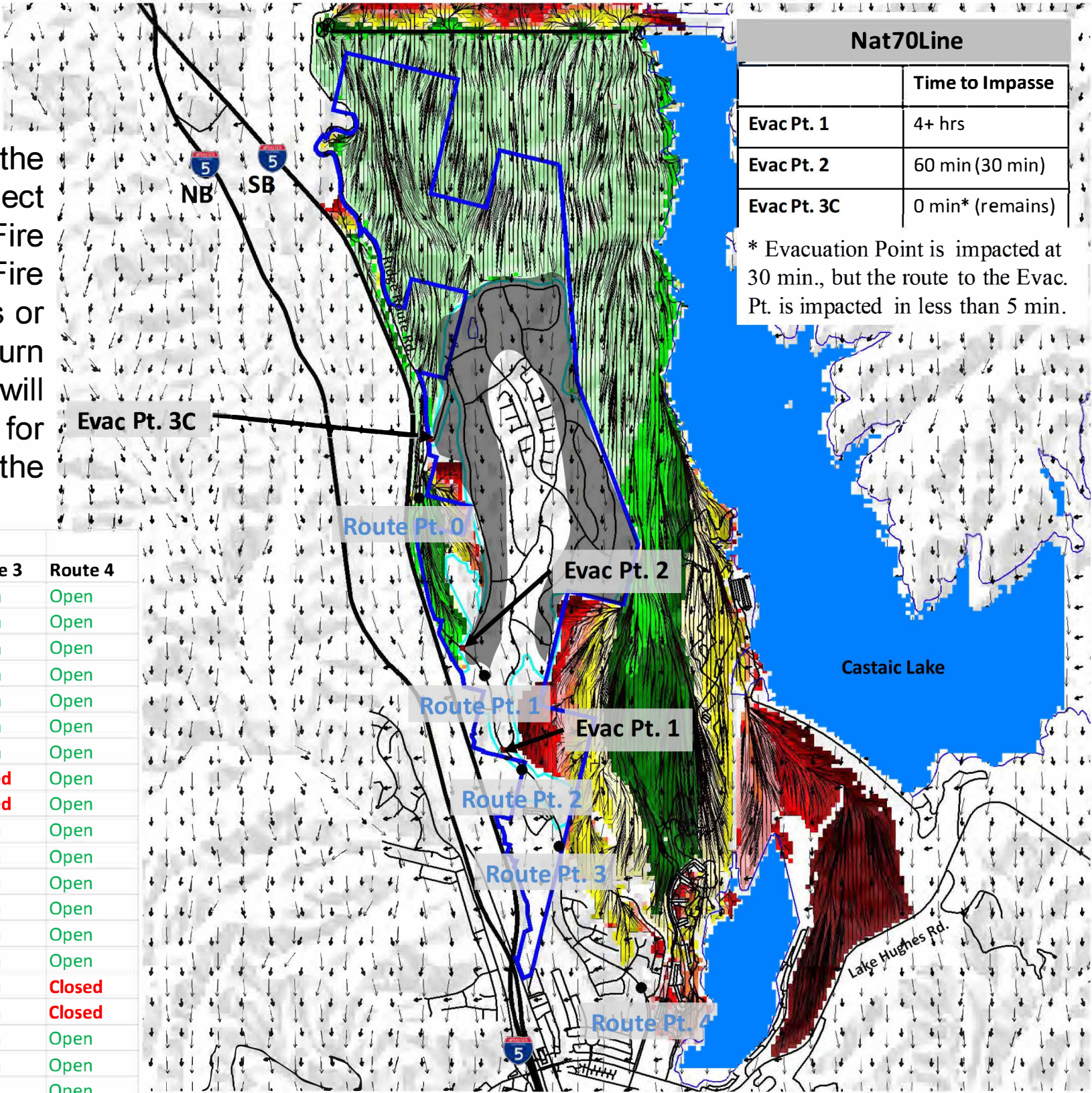
\* Evacuation Point is impacted at 30 min., but the route to the Evac. Pt. is impacted in less than 5 min.



Wind Driven Fire at North Interface (Wind N direction @ 70 mph) with Partial Creek Avoidance Development

Narrative: Fire is modeled from an existing line of fire to the North of the Project Site. Wind is from the North at 70 mph. Fire impact the Project Site in less than 5 minutes if the fire has progressed to this point. Fire continues to burn south along the eastern edge of the Project Site. Fire may spot across the freeway but will not impact the evacuation points or route points if it did so if was not modeled. Fire will continue to burn south on the west side of the Project Site down to Evac Pt. 2. Fire will eventually impact Ridge Route to the south and close all evacuations for a period of 30-60 min. This will occur approximately two hours into the simulated event and again at approximately four hours.

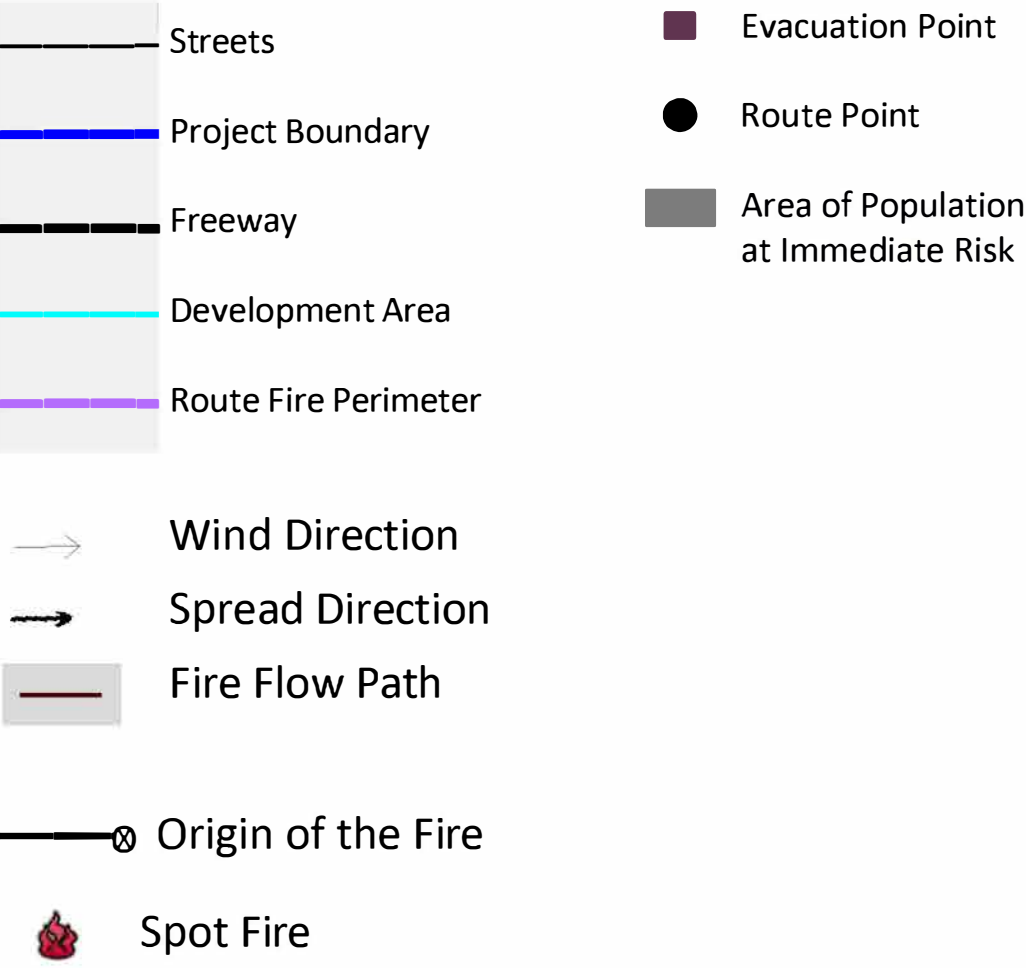
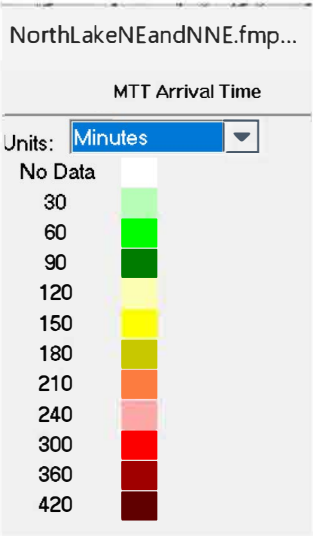
N at 70 mphParital Creek Avoidance				Evacuation to the South							
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
30	0:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
45	0:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
60	1:00	Open	Closed	n/a	n/a	Closed	Closed	Open	Open	Open	Open
75	1:15	Open	Closed	n/a	n/a	Closed	Closed	Open	Open	Open	Open
90	1:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
105	1:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
120	2:00	Open	Open	n/a	n/a	Closed	Open	Open	Open	Closed	Open
135	2:15	Open	Open	n/a	n/a	Closed	Open	Open	Open	Closed	Open
150	2:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
165	2:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
180	3:00	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
195	3:15	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
210	3:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
225	3:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
240	4:00	Closed	Open	n/a	n/a	Closed	Open	Open	Closed	Open	Closed
255	4:15	Closed	Open	n/a	n/a	Closed	Open	Open	Closed	Open	Closed
270	4:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
285	4:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
300	5:00	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
315	5:15	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
330	5:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
345	5:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
360	6:00	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
375	6:15	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
390	6:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
405	6:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
420	7:00	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open



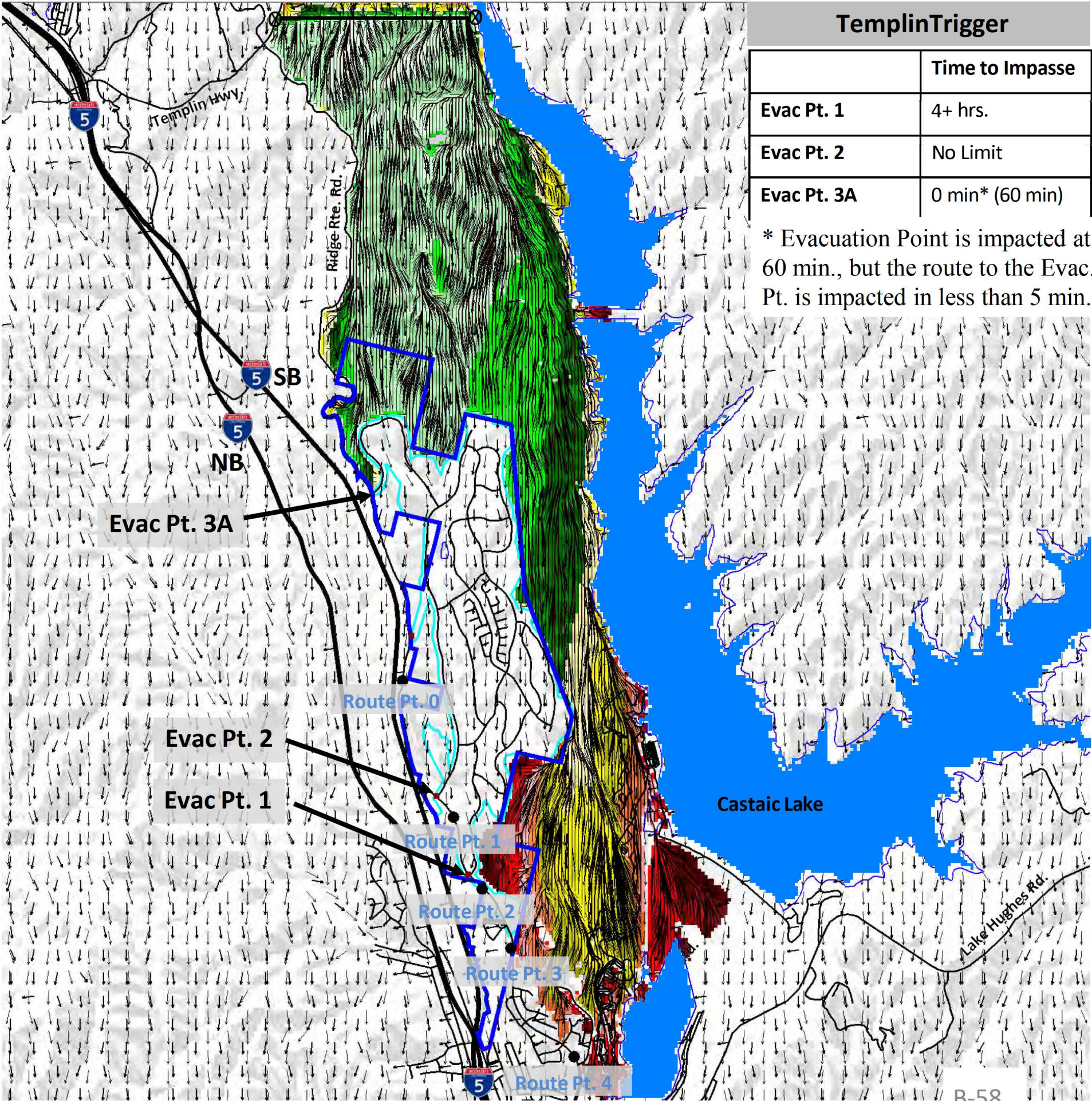


Templin Highway and Ridge Route Road Trigger Point  
Previously Approved Development

Fire does not impact the southern evacuation routes for over 3 hours. By this time, the fire front has pasted the balance of the project site. A fire of this size in this direction is not within the current fire history database in this area.



N wind at 70 Line



TemplinTrigger	
	Time to Impasse
Evac Pt. 1	4+ hrs.
Evac Pt. 2	No Limit
Evac Pt. 3A	0 min* (60 min)

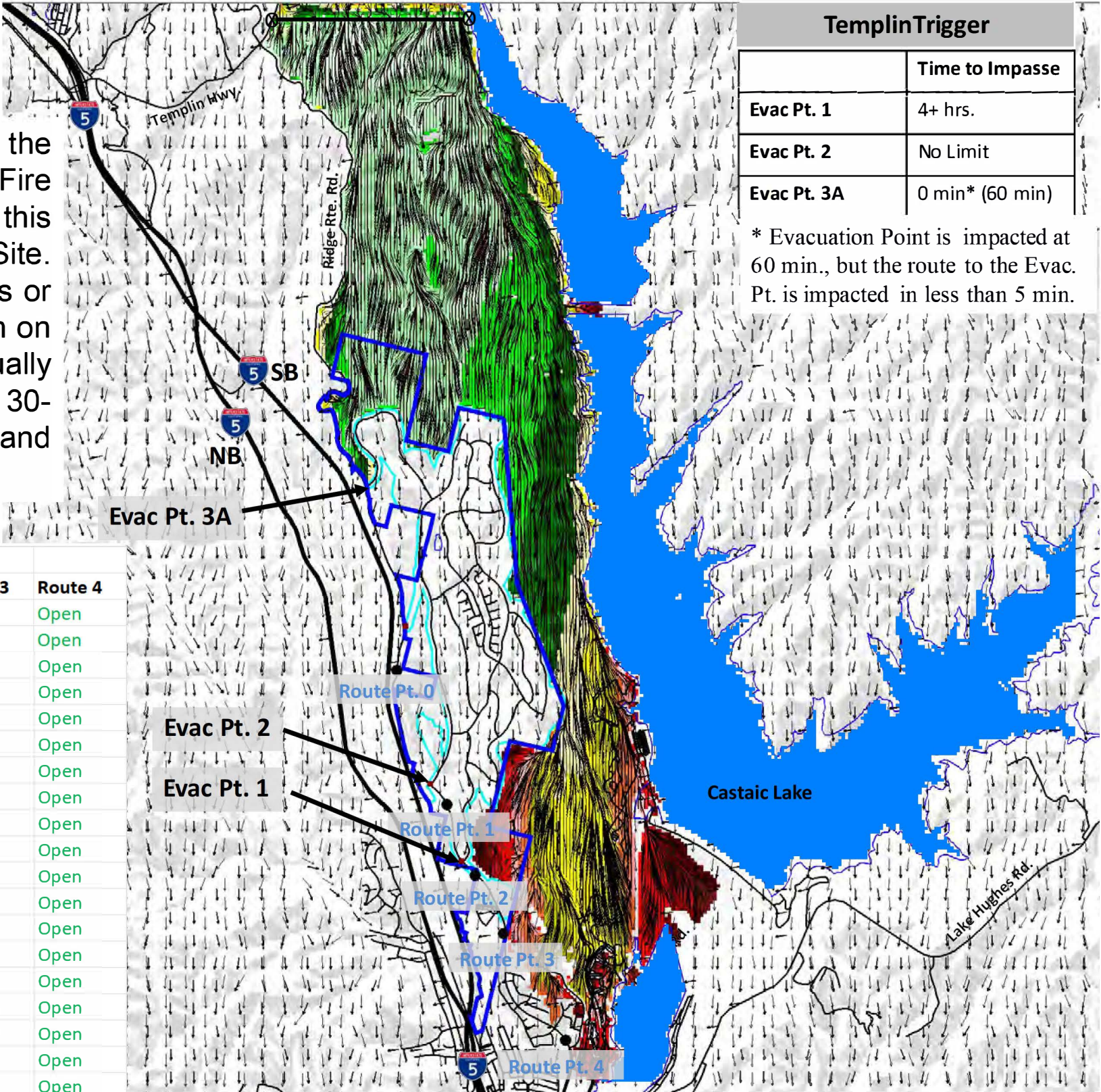
\* Evacuation Point is impacted at 60 min., but the route to the Evac. Pt. is impacted in less than 5 min.



Templin Highway and Ridge Route Road Trigger Point  
Previously Approved Development

Narrative: Fire is modeled from an existing line of fire to the North of the Project Site at Templin Highway. Wind is from the North at 70 mph. Fire impact the Project Site in less than 10 minutes if the fire has progressed to this point. Fire continues to burn south along the eastern edge of the Project Site. Fire may spot across the freeway but will not impact the evacuation points or route points if it did so if was not modeled. Fire will continue to burn south on the west side of the Project Site down to Evac Pt. 3A. Fire will eventually impact Ridge Route to the south and close all evacuations for a period of 30-60 min. This will occur approximately two hours into the simulated event and again at approximately four hours and again at five hours.

Templin at 70 mph Approved		Evacuation to the South								
	Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
30	0:30 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
45	0:45 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
60	1:00 Open	Open	Closed	n/a	n/a	Open	Open	Open	Open	Open
75	1:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
90	1:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
105	1:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
120	2:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
135	2:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
150	2:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
165	2:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
180	3:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
195	3:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
210	3:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
225	3:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
240	4:00 Closed	Open	Open	n/a	n/a	Open	Open	Open	Closed	Open
255	4:15 Closed	Open	Open	n/a	n/a	Open	Open	Open	Closed	Open
270	4:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
285	4:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
300	5:00 Open	Open	Open	n/a	n/a	Open	Open	Closed	Open	Closed
315	5:15 Open	Open	Open	n/a	n/a	Open	Open	Closed	Open	Closed
330	5:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
345	5:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
360	6:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
375	6:15 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
390	6:30 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
405	6:45 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open
420	7:00 Open	Open	Open	n/a	n/a	Open	Open	Open	Open	Open





Templin Highway and Ridge Route Road Trigger Point Creek Avoidance Development

Fire does not impact the southern evacuation routes for over 3 hours. By this time, the fire front has pasted the balance of the project site. A fire of this size in this direction is not within the current fire history database in this area.

Origin to first spot 30 min.  
First spot to second spot 30 min

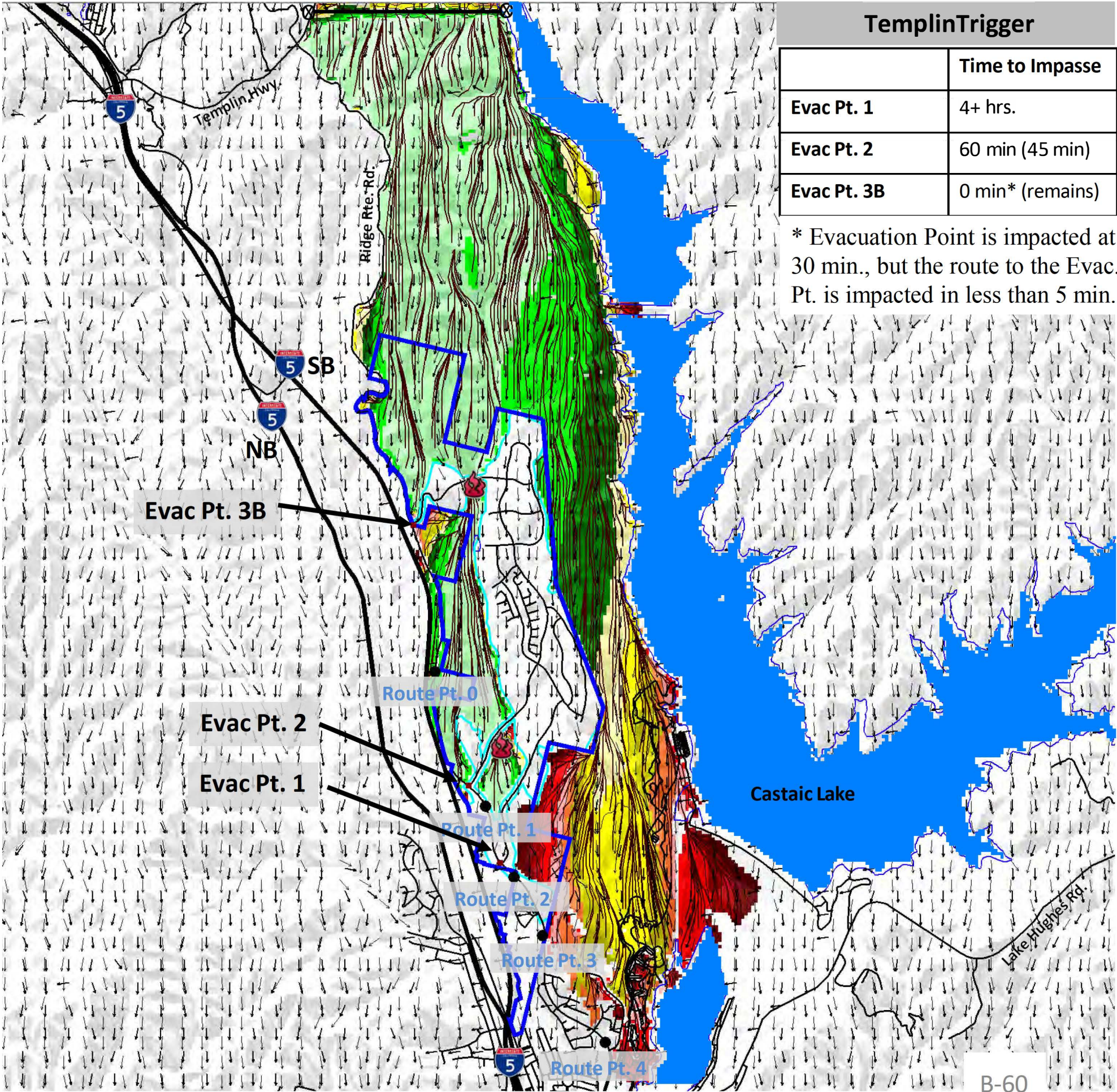
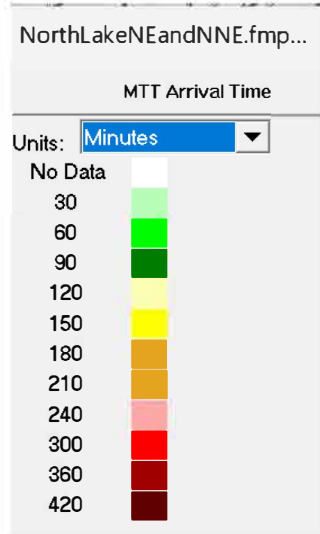
- Streets
- Project Boundary
- Freeway
- Development Area
- Route Fire Perimeter

- Wind Direction
- Spread Direction
- Fire Flow Path

- Origin of the Fire
- Spot Fire

N wind at 70 Line

- Evacuation Point
- Route Point
- Area of Population at Immediate Risk

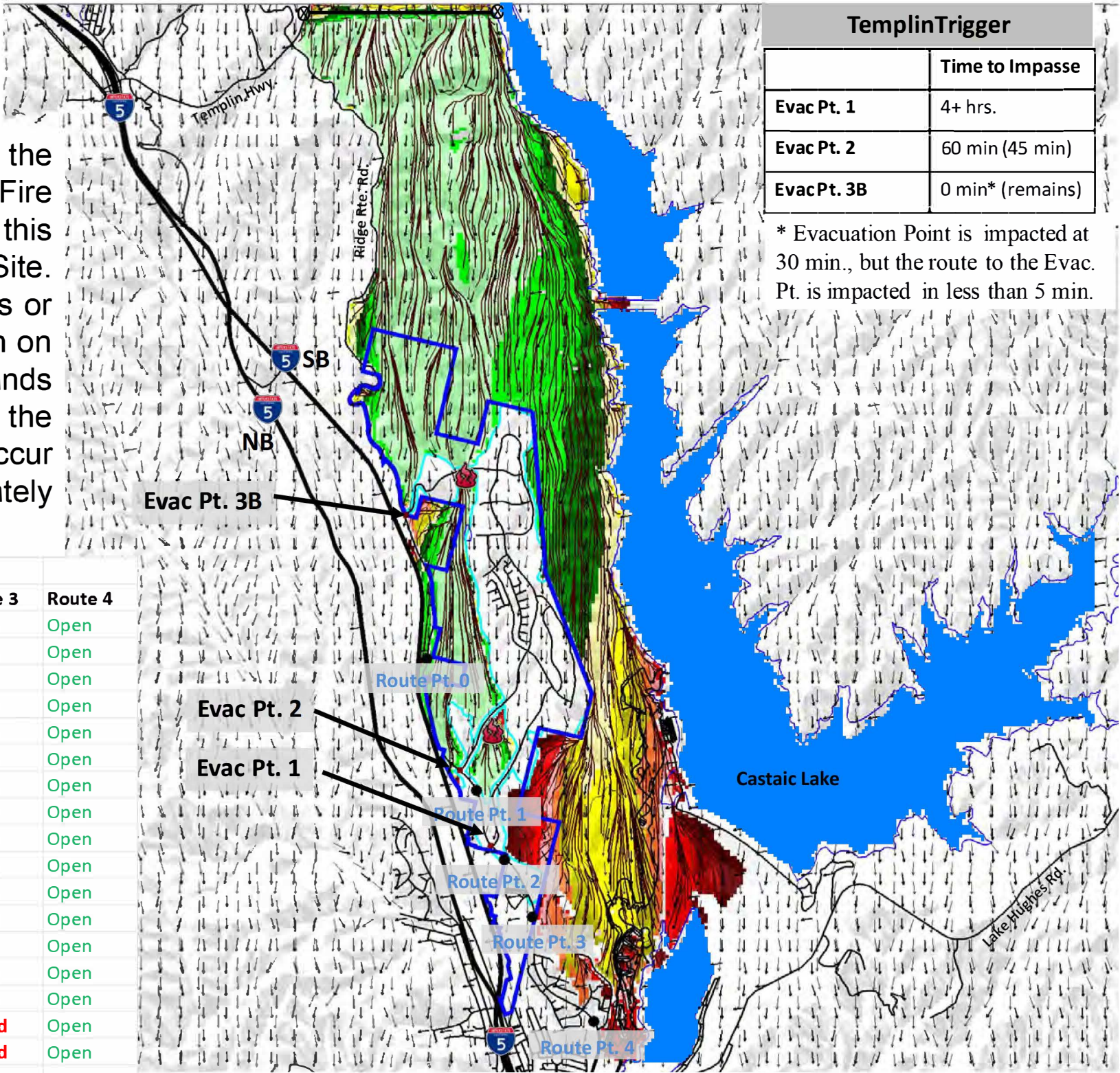




Templin Highway and Ridge Route Road Trigger Point  
Creek Avoidance Development

Narrative: Fire is modeled from an existing line of fire to the North of the Project Site at Templin Highway. Wind is from the North at 70 mph. Fire impact the Project Site in less than 10 minutes if the fire has progressed to this point. Fire continues to burn south along the eastern edge of the Project Site. Fire may spot across the freeway but will not impact the evacuation points or route points if it did so if it was not modeled. Fire will continue to burn south on the west side of the Project Site down to Evac Pt. 1 due to the fuel islands between the access roads. Fire will eventually impact Ridge Route to the south and close all evacuations for a period of 30-60 min. This will occur approximately two hours into the simulated event and again at approximately four hours and again at five hours.

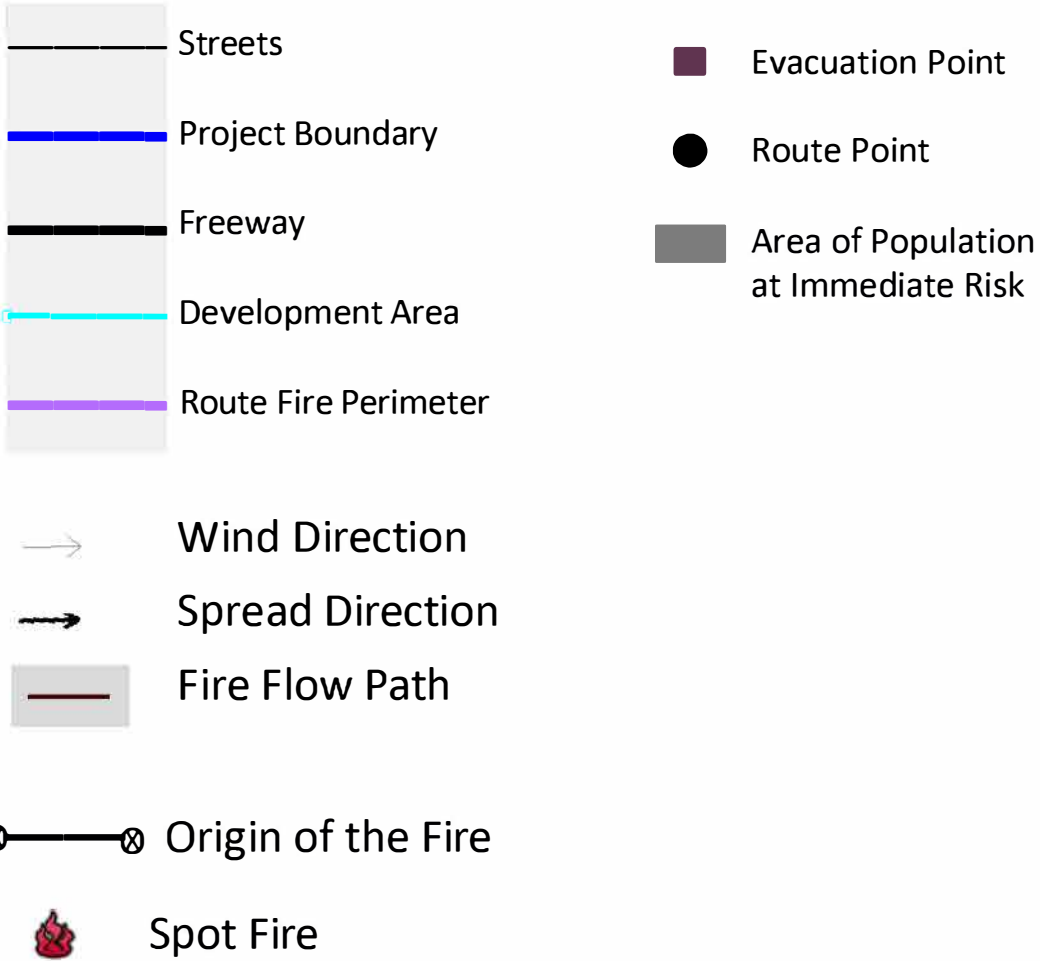
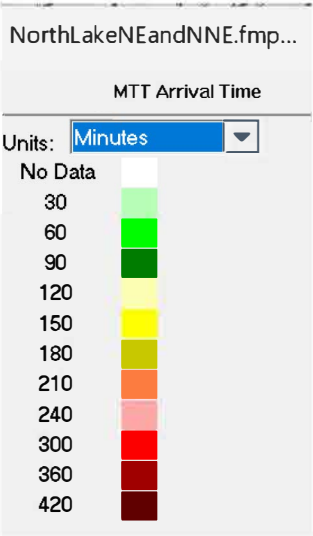
Templin at 70 mph Creek Avoidance		Evacuation to the South									
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
30	0:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
45	0:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
60	1:00	Open	Closed	n/a	Closed	n/a	Closed	Closed	Open	Open	Open
75	1:15	Open	Closed	n/a	Closed	n/a	Closed	Closed	Open	Open	Open
90	1:30	Open	Closed	n/a	Closed	n/a	Open	Open	Open	Open	Open
105	1:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
120	2:00	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
135	2:15	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
150	2:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
165	2:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
180	3:00	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
195	3:15	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
210	3:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
225	3:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
240	4:00	Closed	Open	n/a	Closed	n/a	Open	Open	Open	Closed	Open
255	4:15	Closed	Open	n/a	Closed	n/a	Open	Open	Open	Closed	Open
270	4:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
285	4:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
300	5:00	Open	Open	n/a	Closed	n/a	Open	Open	Closed	Open	Closed
315	5:15	Open	Open	n/a	Closed	n/a	Open	Open	Closed	Open	Closed
330	5:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
345	5:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
360	6:00	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
375	6:15	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
390	6:30	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
405	6:45	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open
420	7:00	Open	Open	n/a	Closed	n/a	Open	Open	Open	Open	Open



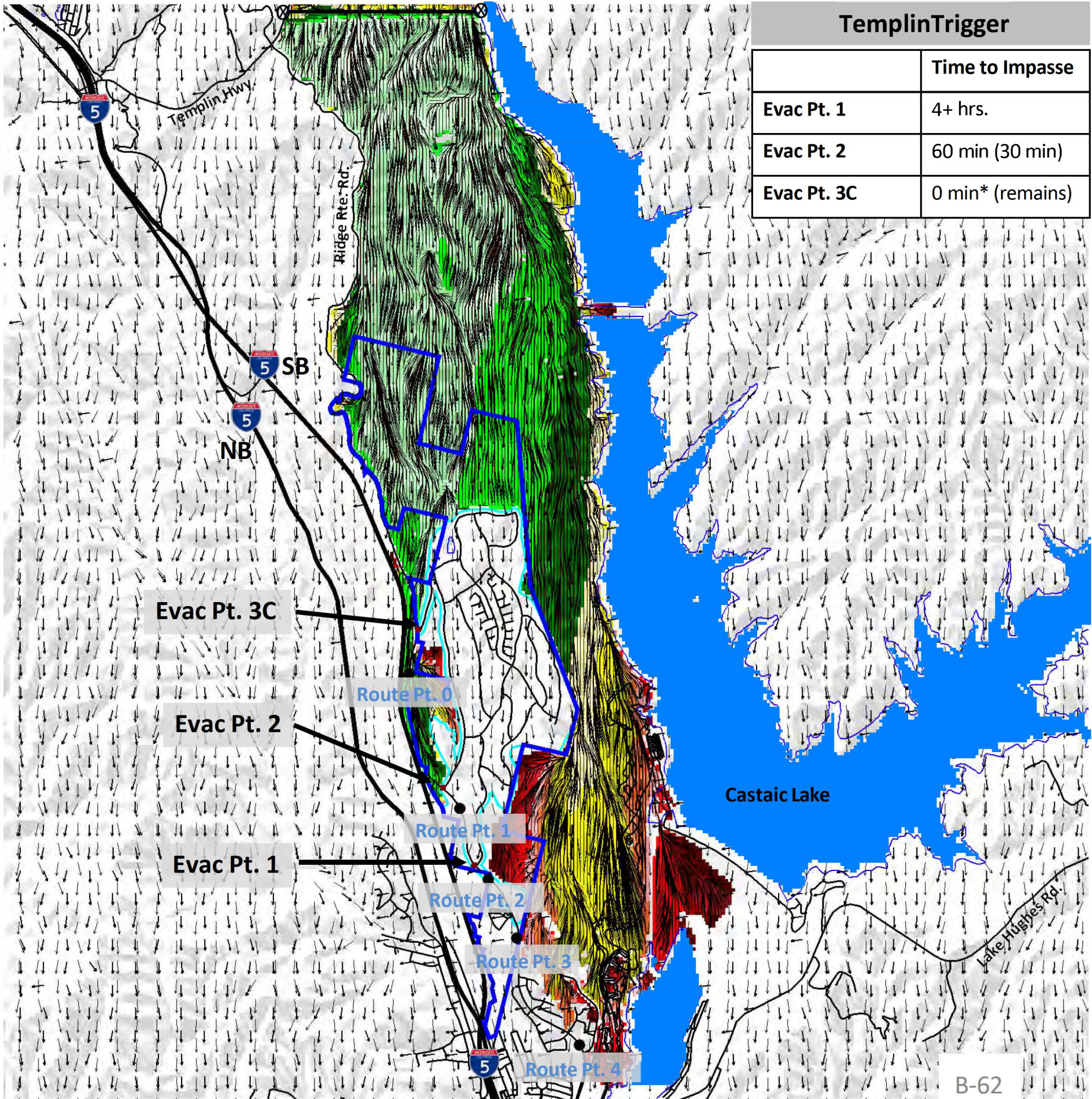


Templin Highway and Ridge Route Road Trigger Point  
Partial Creek Avoidance Development

Fire does not impact the southern evacuation routes for over 3 hours. By this time, the fire front has pasted the balance of the project site. A fire of this size in this direction is not within the current fire history database in this area.



N wind at 70 Line



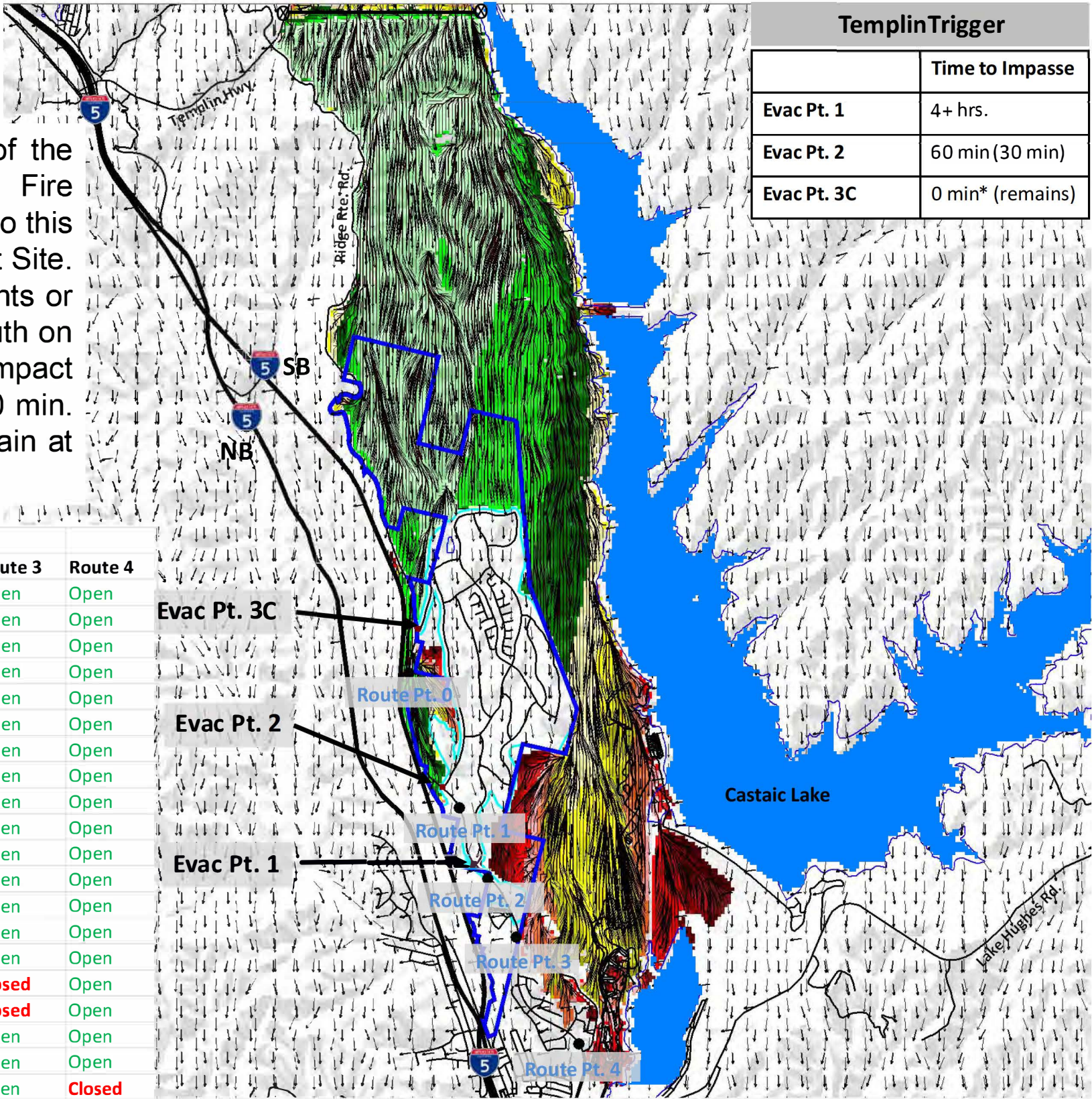
TemplinTrigger	
	Time to Impasse
Evac Pt. 1	4+ hrs.
Evac Pt. 2	60 min (30 min)
Evac Pt. 3C	0 min* (remains)



Templin Highway and Ridge Route Road Trigger Point  
Partial Creek Avoidance Development

Narrative: Fire is modeled from an existing line of fire to the North of the Project Site at Templin Highway. Wind is from the North at 70 mph. Fire impact the Project Site in less than 10 minutes if the fire has progressed to this point. Fire continues to burn south along the eastern edge of the Project Site. Fire may spot across the freeway but will not impact the evacuation points or route points if it did so if was not modeled. Fire will continue to burn south on the west side of the Project Site down to Evac Pt. 2. Fire will eventually impact Ridge Route to the south and close all evacuations for a period of 30-60 min. This will occur approximately two hours into the simulated event and again at approximately four hours and again at five hours.

Templin at 70 mph		Parital Creek Avoidance		Evacuation to the South							
		Evac Pt 1	Evac Pt 2	Evac Pt. 3A	Evac Pt. 3B	Evac Pt. 3C	Route 0	Route 1	Route 2	Route 3	Route 4
15	0:15	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
30	0:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
45	0:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
60	1:00	Open	Closed	n/a	n/a	Closed	Closed	Open	Open	Open	Open
75	1:15	Open	Closed	n/a	n/a	Closed	Closed	Open	Open	Open	Open
90	1:30	Open	Closed	n/a	n/a	Closed	Open	Open	Open	Open	Open
105	1:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
120	2:00	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
135	2:15	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
150	2:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
165	2:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
180	3:00	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
195	3:15	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
210	3:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
225	3:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
240	4:00	Closed	Open	n/a	n/a	Closed	Open	Open	Open	Closed	Open
255	4:15	Closed	Open	n/a	n/a	Closed	Open	Open	Open	Closed	Open
270	4:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
285	4:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
300	5:00	Open	Open	n/a	n/a	Closed	Open	Open	Closed	Open	Closed
315	5:15	Open	Open	n/a	n/a	Closed	Open	Open	Closed	Open	Closed
330	5:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
345	5:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
360	6:00	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
375	6:15	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
390	6:30	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
405	6:45	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open
420	7:00	Open	Open	n/a	n/a	Closed	Open	Open	Open	Open	Open



TemplinTrigger	
	Time to Impasse
Evac Pt. 1	4+ hrs.
Evac Pt. 2	60 min (30 min)
Evac Pt. 3C	0 min* (remains)





## Inputs: SURFACE

Description

Dry Climate Fuels - NorthLake

### Fuel/Vegetation, Surface/Understory

Fuel Model

gr1, gr2, gs1, gs2, sh1, sh2, tu5, S

### Fuel Moisture

1-h Fuel Moisture	%	<u>3</u>
10-h Fuel Moisture	%	<u>4</u>
100-h Fuel Moisture	%	<u>5</u>
Live Herbaceous Fuel Moisture	%	<u>30</u>
Live Woody Fuel Moisture	%	<u>50</u>

### Weather

20-ft Wind Speed	mi/h	<u>0, 25, 45, 65, 80</u>
Wind Adjustment Factor		<u>0.5</u>
Wind Direction (from north)	deg	<u>45</u>

### Terrain

Slope Steepness	%	<u>100</u>
Site Aspect	deg	<u>45</u>

## Run Option Notes

- Maximum effective wind speed limit IS imposed [SURFACE].
- Fire spread is in the HEADING direction only [SURFACE].
- Wind is in specified directions [SURFACE].
- Wind and spread directions are degrees clockwise from north [SURFACE].
- Wind direction is the direction from which the wind is blowing [SURFACE].

## Output Variables

- Surface Fire Rate of Spread (ft/min) [SURFACE]
- Surface Fireline Intensity (kW/m) [SURFACE]
- Surface Fire Flame Length (ft) [SURFACE]
- Flame Residence Time (min) [SURFACE]
- Total Dead Fuel Load (ton/ac) [SURFACE]

(continued on next page)





Fuel model parameters													Dead Component Calculation								
Fuel Model	Fuel Model		Fuel load (t/ac)						Fuel model	SAV ratio (1/ft) <sup>b</sup>			Fuel bed depth	Dead fuel extinction moisture	Heat content	Fuel Model					
			1-hr	10-hr	100-hr	Live herb	Live woody	Dead		Live herb	Live woody	100% Transfer					Percentage				
Code	Number	Climate	1-hr	10-hr	100-hr	herb	woody	type <sup>a</sup>	1-hr	herb	woody	(ft)	(percent)	BTU/lb <sup>c</sup>	Code	Dead	Herb	Dead load	Total Load	id Component	
GR1	101	Dry	0.10	0.00	0.00	0.30	0.00	dynamic	2200	2000	9999	0.4	15	8000	GR1	0.10	0.30	0.19	0.40	48%	
GR2	102	Dry	0.10	0.00	0.00	1.00	0.00	dynamic	2000	1800	9999	1.0	15	8000	GR2	0.10	1.00	1.10	1.10	100%	
GS1	121	Dry	0.20	0.00	0.00	0.50	0.65	dynamic	2000	1800	1800	0.9	15	8000	GS1	0.20	0.50	0.45	1.35	33%	
GS2	122	Dry	0.50	0.50	0.00	0.60	1.00	dynamic	2000	1800	1800	1.5	15	8000	GS2	1.00	0.60	1.36	2.60	52%	
SH1	141	Dry	0.25	0.25	0.00	0.15	1.30	dynamic	2000	1800	1600	1.0	15	8000	SH1	0.50	0.15	0.52	1.95	27%	
SH2	142	Dry	1.35	2.40	0.75	0.00	3.85	static	2000	9999	1600	1.0	15	8000	SH2	4.50	no transfer	4.50	8.35	54%	
TU5	165	Dry	4.00	4.00	3.00	0.00	3.00	static	1500	9999	750	1.0	25	8000	TU5	11.00	no transfer	11.00	14.00	79%	
SCAL14	N/A	N/A	3.00	4.50	1.05	1.45	5.00	static	350	1500	250	3.0	15	9211	SCAL14	8.55	no transfer	8.55	15.00	57%	
SCAL15	N/A	N/A	2.00	3.00	1.00	0.50	2.00	static	640	220	640	3.0	13	10000	SCAL15	6.00	no transfer	6.00	8.50	71%	
SCAL17	N/A	N/A	1.30	1.00	1.00	2.00	2.00	static	640	2200	640	4.0	20	8000	SCAL17	3.30	no transfer	3.30	7.30	45%	
SCAL18	N/A	N/A	5.50	0.80	0.10	0.75	2.50	static	640	1500	640	3.0	25	9200	SCAL18	6.40	no transfer	6.40	9.65	66%	
SH5	145	Dry	3.60	2.10	0.00	0.00	2.90	static	750	9999	1600	6.0	15	8000	SH5	5.70	no transfer	5.70	8.60	66%	
SH7	147	Dry	3.50	5.30	2.20	0.00	3.40	static	750	9999	1600	6.0	15	8000	SH7	11.00	no transfer	11.00	14.40	76%	
SCAL16	N/A	N/A	2.25	4.80	1.80	3.00	2.85	static	500	1500	500	6.0	15	8000	SCAL16	8.85	no transfer	8.85	14.70	60%	
Reference Only																					
Model 4	4	N/A	5.01	4.01	2.00	0.00	5.01	static	2000	1500	1500	6.0	20	8000	Model 4	11.02	no transfer	11.02	16.03	69%	
Model 6	6	N/A	1.50	2.50	2.00	0.00	0.00	static	1750	1500	1500	2.5	25	8000	Model 6	6.00	no transfer	6.00	6.00	100%	

<sup>a</sup> Fuel model type does not apply to fuel models without live herbaceous load.

<sup>b</sup> The value 9999 was assigned in cases where there is no load in a particular fuel class or category

<sup>c</sup> The same heat content value was applied to both live and dead fuel categories.

Note: Dynamic fuels calculated at 100% herbaceous live fuel load transfer due to extreme low fuel moisture in the worse case scenario





## Dry Climate Fuels - NorthLake

### Head Fire

### Surface Fire Rate of Spread (ft/min)

Fuel Model	20-ft Wind Speed				
	mi/h				
	0	25	45	65	80
gr1	30.0	30.0	30.0	30.0	30.0
gr2	108.9	268.7	268.7	268.7	268.7
gs1	54.0	181.3	203.3	203.3	203.3
gs2	75.1	249.7	486.6	565.2	565.2
sh1	31.7	102.1	120.2	120.2	120.2
sh2	23.9	69.6	127.4	196.4	254.2
tu5	29.1	71.6	113.8	159.5	195.5
SCAL14	45.4	117.9	170.9	222.3	260.1
SCAL15	52.8	151.3	236.8	325.0	392.3
SCAL17	84.7	273.9	511.7	795.3	907.0
SCAL18	81.2	225.6	329.8	430.4	504.3
sh5	150.6	477.4	807.9	1168.3	1453.3
sh7	106.0	316.5	526.9	755.4	935.6
SCAL16	78.8	231.0	367.3	509.2	618.3





## Dry Climate Fuels - NorthLake

### Head Fire

### Surface Fireline Intensity (kW/m)

Fuel Model	20-ft Wind Speed				
	mi/h				
	0	25	45	65	80
gr1	151	151	151	151	151
gr2	1636	4037	4037	4037	4037
gs1	1095	3675	4122	4122	4122
gs2	2483	8262	16100	18700	18700
sh1	747	2412	2838	2838	2838
sh2	2045	5955	10895	16798	21733
tu5	5120	12593	20022	28070	34406
SCAL14	10036	26051	37756	49107	57462
SCAL15	5289	15161	23740	32575	39321
SCAL17	4275	13831	25840	40159	45799
SCAL18	19164	53264	77865	101620	119060
sh5	16779	53199	90025	130182	161930
sh7	15952	47643	79330	113730	140854
SCAL16	9854	28906	45959	63713	77359





## Dry Climate Fuels - NorthLake

### Head Fire

### Surface Fire Flame Length (ft)

Fuel Model	20-ft Wind Speed				
	mi/h				
	0	25	45	65	80
gr1	2.6	2.6	2.6	2.6	2.6
gr2	7.6	11.6	11.6	11.6	11.6
gs1	6.4	11.1	11.7	11.7	11.7
gs2	9.3	16.1	21.9	23.4	23.4
sh1	5.3	9.1	9.8	9.8	9.8
sh2	8.5	13.8	18.3	22.3	25.1
tu5	12.9	19.5	24.2	28.3	31.0
SCAL14	17.6	27.3	32.4	36.6	39.3
SCAL15	13.1	21.3	26.2	30.3	33.0
SCAL17	11.9	20.4	27.2	33.3	35.4
SCAL18	23.7	37.9	45.2	51.1	54.9
sh5	22.3	37.9	48.3	57.2	63.3
sh7	21.8	36.0	45.6	53.8	59.4
SCAL16	17.5	28.6	35.5	41.2	45.1





## Dry Climate Fuels - NorthLake

### Head Fire

#### Flame Residence Time (min)

Fuel Model	20-ft Wind Speed				
	mi/h				
	0	25	45	65	80
gr1	0.19	0.19	0.19	0.19	0.19
gr2	0.21	0.21	0.21	0.21	0.21
gs1	0.21	0.21	0.21	0.21	0.21
gs2	0.21	0.21	0.21	0.21	0.21
sh1	0.23	0.23	0.23	0.23	0.23
sh2	0.23	0.23	0.23	0.23	0.23
tu5	0.31	0.31	0.31	0.31	0.31
SCAL14	0.48	0.48	0.48	0.48	0.48
SCAL15	0.38	0.38	0.38	0.38	0.38
SCAL17	0.23	0.23	0.23	0.23	0.23
SCAL18	0.49	0.49	0.49	0.49	0.49
sh5	0.31	0.31	0.31	0.31	0.31
sh7	0.31	0.31	0.31	0.31	0.31
SCAL16	0.36	0.36	0.36	0.36	0.36





## Dry Climate Fuels - NorthLake

### Head Fire

### Total Dead Fuel Load (ton/ac)

Fuel Model	20-ft Wind Speed				
	mi/h				
	0	25	45	65	80
gr1	0.400	0.400	0.400	0.400	0.400
gr2	1.100	1.100	1.100	1.100	1.100
gs1	0.700	0.700	0.700	0.700	0.700
gs2	1.600	1.600	1.600	1.600	1.600
sh1	0.650	0.650	0.650	0.650	0.650
sh2	4.500	4.500	4.500	4.500	4.500
tu5	11.000	11.000	11.000	11.000	11.000
SCAL14	8.550	8.550	8.550	8.550	8.550
SCAL15	6.000	6.000	6.000	6.000	6.000
SCAL17	3.300	3.300	3.300	3.300	3.300
SCAL18	6.400	6.400	6.400	6.400	6.400
sh5	5.700	5.700	5.700	5.700	5.700
sh7	11.000	11.000	11.000	11.000	11.000
SCAL16	8.850	8.850	8.850	8.850	8.850





## Discrete Variable Codes Used

### Dry Climate Fuels - NorthLake

#### Fuel Model

101	gr1	Short, sparse, dry climate grass (D)
102	gr2	Low load, dry climate grass (D)
121	gs1	Low load, dry climate grass-shrub (D)
122	gs2	Moderate load, dry climate grass-shrub (D)
141	sh1	Low load, dry climate shrub (D)
142	sh2	Moderate load, dry climate shrub (S)
165	tu5	Very high load, dry climate timber-shrub (S)
14	SCAL14	Manzanita
15	SCAL15	Chamise 1
17	SCAL17	Chamise 2
18	SCAL18	Sage / Buckwheat
145	sh5	High load, dry climate shrub (S)
147	sh7	Very high load, dry climate shrub (S)
16	SCAL16	North Slope Ceanothus





## Inputs: SURFACE

Description Climate Fuels - NorthLake Slope

### Fuel/Vegetation, Surface/Understory

Fuel Model SCAL18

### Fuel Moisture

1-h Fuel Moisture % 3

10-h Fuel Moisture % 4

100-h Fuel Moisture % 5

Live Herbaceous Fuel Moisture % 30

Live Woody Fuel Moisture % 50

### Weather

20-ft Wind Speed mi/h 0, 25, 45, 65, 80

Wind Adjustment Factor 0.5

Wind Direction (from north) deg 45

### Terrain

Slope Steepness % 0, 10, 20, 30, 40, 50, 60, 70, 80, 9

Site Aspect deg 45

### Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the HEADING direction only [SURFACE].

Wind is in specified directions [SURFACE].

Wind and spread directions are degrees clockwise from north [SURFACE].

Wind direction is the direction from which the wind is blowing [SURFACE].

### Output Variables

Surface Fire Rate of Spread (ft/min) [SURFACE]

Surface Fireline Intensity (kW/m) [SURFACE]

Surface Fire Flame Length (ft) [SURFACE]

Flame Residence Time (min) [SURFACE]

(continued on next page)





Input Worksheet (continued)

Notes

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## Climate Fuels - NorthLake Slope

### Head Fire

### Surface Fire Rate of Spread (ft/min)

Slope %	20-ft Wind Speed mi/h				
	0	25	45	65	80
0	3.0	147.4	251.6	352.2	426.1
10	3.7	148.2	252.4	353.0	426.9
20	6.1	150.5	254.7	355.3	429.2
30	10.0	154.4	258.6	359.3	433.1
40	15.5	159.9	264.1	364.7	438.6
50	22.5	166.9	271.2	371.8	445.6
60	31.1	175.6	279.8	380.4	454.2
70	41.3	185.7	289.9	390.5	464.4
80	53.0	197.5	301.7	402.3	476.1
90	66.3	210.8	315.0	415.6	489.4
100	81.2	225.6	329.8	430.4	504.3





## Climate Fuels - NorthLake Slope

### Head Fire

### Surface Fireline Intensity (kW/m)

Slope %	20-ft Wind Speed mi/h				
	0	25	45	65	80
0	697	34798	59399	83153	100594
10	882	34983	59583	83338	100778
20	1436	35537	60137	83892	101332
30	2359	36460	61061	84815	102255
40	3652	37753	62353	86108	103548
50	5314	39415	64015	87770	105210
60	7345	41446	66047	89801	107241
70	9746	43846	68447	92202	109642
80	12516	46616	71217	94972	112412
90	15655	49756	74357	98111	115551
100	19164	53264	77865	101620	119060





## Climate Fuels - NorthLake Slope

### Head Fire

### Surface Fire Flame Length (ft)

Slope %	20-ft Wind Speed mi/h				
	0	25	45	65	80
0	5.2	31.2	39.9	46.6	50.8
10	5.8	31.3	40.0	46.6	50.9
20	7.2	31.5	40.1	46.8	51.0
30	9.0	31.9	40.4	47.0	51.2
40	11.1	32.4	40.8	47.3	51.5
50	13.1	33.0	41.3	47.7	51.9
60	15.3	33.8	41.9	48.3	52.4
70	17.4	34.7	42.6	48.8	52.9
80	19.5	35.7	43.4	49.5	53.5
90	21.6	36.8	44.2	50.3	54.2
100	23.7	37.9	45.2	51.1	54.9





## Climate Fuels - NorthLake Slope

### Head Fire

### Flame Residence Time (min)

Slope %	20-ft Wind Speed mi/h				
	0	25	45	65	80
0	0.49	0.49	0.49	0.49	0.49
10	0.49	0.49	0.49	0.49	0.49
20	0.49	0.49	0.49	0.49	0.49
30	0.49	0.49	0.49	0.49	0.49
40	0.49	0.49	0.49	0.49	0.49
50	0.49	0.49	0.49	0.49	0.49
60	0.49	0.49	0.49	0.49	0.49
70	0.49	0.49	0.49	0.49	0.49
80	0.49	0.49	0.49	0.49	0.49
90	0.49	0.49	0.49	0.49	0.49
100	0.49	0.49	0.49	0.49	0.49





## Discrete Variable Codes Used Climate Fuels - NorthLake Slope

Fuel Model

18

SCAL18

Sage / Buckwheat



**Inputs: SURFACE**

Description	<u>Dry Climate Fuels - NorthLake Chaparral</u>	
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**Fuel/Vegetation, Surface/Understory**

Chaparral Fuel Type		<u>Chamise, MixedBrush</u>
Chaparral Fuel Bed Depth	ft	<u>10</u>
Chaparral Dead Load Fraction	%	<u>64</u>

**Fuel Moisture**

1-h Fuel Moisture	%	<u>3</u>
10-h Fuel Moisture	%	<u>4</u>
100-h Fuel Moisture	%	<u>5</u>
Live Herbaceous Fuel Moisture	%	<u>30</u>
Live Woody Fuel Moisture	%	<u>50</u>

**Weather**

20-ft Wind Speed	mi/h	<u>0, 25, 45, 65, 80</u>
Wind Adjustment Factor		<u>0.5</u>
Wind Direction (from north)	deg	<u>45</u>

**Terrain**

Slope Steepness	%	<u>100</u>
Site Aspect	deg	<u>45</u>

**Run Option Notes**

Maximum effective wind speed limit IS imposed [SURFACE].

A special case fuel model is used: chaparral  
(Rothermel and Philpot 1973) [SURFACE].

Fire spread is in the HEADING direction only [SURFACE].

Wind is in specified directions [SURFACE].

Wind and spread directions are degrees clockwise from north [SURFACE].

Wind direction is the direction from which the wind is blowing [SURFACE].

**Output Variables**

Surface Fire Rate of Spread (ft/min) [SURFACE]

Surface Fireline Intensity (kW/m) [SURFACE]

Surface Fire Flame Length (ft) [SURFACE]

Surface Fire Dir of Max Spread (from north) (deg) [SURFACE]

Flame Residence Time (min) [SURFACE]

(continued on next page)





Input Worksheet (continued)

Chaparral Total Fuel Load (ton/ac) [SURFACE]

Chaparral Total Dead Fuel Load (ton/ac) [SURFACE]

Chaparral Total Live Fuel Load (ton/ac) [SURFACE]

Notes

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## Dry Climate Fuels - NorthLake Chaparral

### Head Fire

#### Surface Fire Rate of Spread (ft/min)

20-ft Wind Speed mi/h	Chaparral Fuel Type	
	Chamise	MixedBrush
0	46 . 3	66 . 2
25	155 . 3	194 . 5
45	163 . 9	265 . 0
65	163 . 9	327 . 6
80	163 . 9	371 . 3





## Dry Climate Fuels - NorthLake Chaparral

### Head Fire

### Surface Fireline Intensity (kW/m)

20-ft Wind Speed mi/h	Chaparral Fuel Type	
	Chamise	MixedBrush
0	4089	18438
25	13705	54223
45	14470	73858
65	14470	91302
80	14470	103478





## Dry Climate Fuels - NorthLake Chaparral

### Head Fire

### Surface Fire Flame Length (ft)

20-ft Wind Speed mi/h	Chaparral Fuel Type	
	Chamise	MixedBrush
0	11 . 7	23 . 3
25	20 . 3	38 . 3
45	20 . 8	44 . 1
65	20 . 8	48 . 6
80	20 . 8	51 . 5





## Dry Climate Fuels - NorthLake Chaparral

### Head Fire

#### Surface Fire Dir of Max Spread (from north) (deg)

20-ft Wind Speed mi/h	Chaparral Fuel Type	
	Chamise	MixedBrush
0	225	225
25	225	225
45	225	225
65	225	225
80	225	225





## Dry Climate Fuels - NorthLake Chaparral

### Head Fire

#### Flame Residence Time (min)

20-ft Wind Speed mi/h	Chaparral Fuel Type	
	Chamise	MixedBrush
0	0.73	0.73
25	0.73	0.73
45	0.73	0.73
65	0.73	0.73
80	0.73	0.73





## Dry Climate Fuels - NorthLake Chaparral

### Head Fire

#### Chaparral Total Fuel Load (ton/ac)

20-ft Wind Speed mi/h	Chaparral Fuel Type	
	Chamise	MixedBrush
0	19 . 807	37 . 456
25	19 . 807	37 . 456
45	19 . 807	37 . 456
65	19 . 807	37 . 456
80	19 . 807	37 . 456





## Dry Climate Fuels - NorthLake Chaparral

### Head Fire

#### Chaparral Total Dead Fuel Load (ton/ac)

20-ft Wind Speed mi/h	Chaparral Fuel Type	
	Chamise	MixedBrush
0	12 . 676	23 . 972
25	12 . 676	23 . 972
45	12 . 676	23 . 972
65	12 . 676	23 . 972
80	12 . 676	23 . 972





## Dry Climate Fuels - NorthLake Chaparral

### Head Fire

#### Chaparral Total Live Fuel Load (ton/ac)

20-ft Wind Speed mi/h	Chaparral Fuel Type	
	Chamise	MixedBrush
0	7 . 130	13 . 484
25	7 . 130	13 . 484
45	7 . 130	13 . 484
65	7 . 130	13 . 484
80	7 . 130	13 . 484





## Discrete Variable Codes Used

### Dry Climate Fuels - NorthLake Chaparral

#### Chaparral Fuel Type

Chamise

MixedBrush

Chamise

MixedBrush