Informational Summary Report of Serious or Near Serious Injuries, Illnesses and Accidents

GREEN SHEET

Firefighter Burn Over

October 26, 2020

Silverado Incident

20-CA-ORC-121364

20-CA-ORC-122066

California Southern Region

SUMMARY

On October 26, 2020, fire suppression resources (Local, State, and Federal) were assigned to a vegetation fire in the area of Santiago Canyon Road west of Silverado Canyon Road, near the community of Silverado, CA. At approximately 12:00 PM, during suppression activities, two Hand Crew Firefighters were overrun by fire and subsequently transported to the hospital with critical injuries.

This informational summary report is intended to enhance safety and training, aid in preventing future occurrences, and to inform interested parties. Because the report is published in a short time frame, the information contained herein is subject to revision as further investigation is conducted and/or additional information is developed.

CONDITIONS

A Red Flag Warning was issued for the area beginning at 2:00 AM on October 26, 2020 due to the strong offshore winds, low humidity, and dry fuels. These conditions contributed to critical spread rates during the first two days of the incident, aiding the fire in reaching 10,000 acres in that period.

Weather:

- Temperature: 60ºF
- Relative Humidity: 8%
- Winds: North Northeast 16 mph with gusts to 42 mph
- Visibility: Clear

Fuel Type:

- The accident site is located in the SC08 South Coast Predictive Service Area (PSA) of the Southern California Geographic Coordination Center (OSCC-GACC).
  Area fuels consisted mainly of annual grasses, both standing and matted down, Chamise, Black Sage, California Sage, Coastal Live Oaks, and Golden Bush. There was no fuel advisory from the OSCC-GACC in place for the area at the time of dispatch.

- The live fuel moisture samples were taken on October 13, 2020, at the Black Star Canyon site that is 1.6 miles away to the East Northeast of the accident site at 1,240’ elevation.
  - Values for Chamise were at 60%, with critical levels below 60. Those fuels reached critical on October 13, 2020.
  - The live fuel moisture values for sage were at 48%, with critical levels below 100%. Those fuels reached and continued to drop below those levels on July 15, 2020.

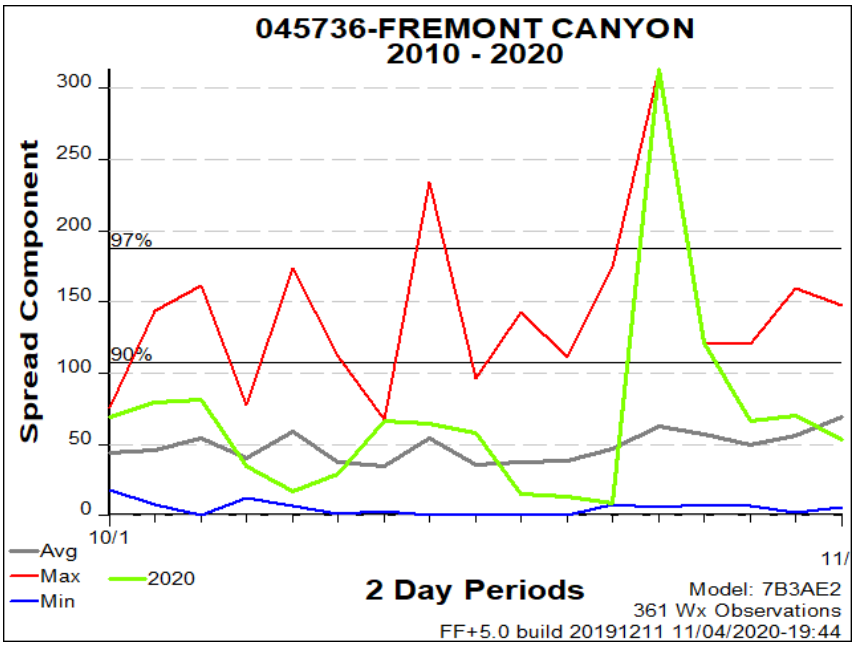
- The incident area is one of the few areas in the state that is not in any drought stage condition.
- Overall the fuels for the area were at critical levels and would continue to drop over the length of the incident due to the dry North Easterly winds returning multiple times through the length of the incident.

Topography:

- The accident site location is mid-slope above a drainage that runs Northeast approximately 340 feet below a sloping ridgeline that parallels that drainage. The average slope from the ridgeline to the drainage is 20 degrees. The drainage was in direct alignment with the dry, Northeast winds.
- Elevation: 1325 feet.
- Aspect: North

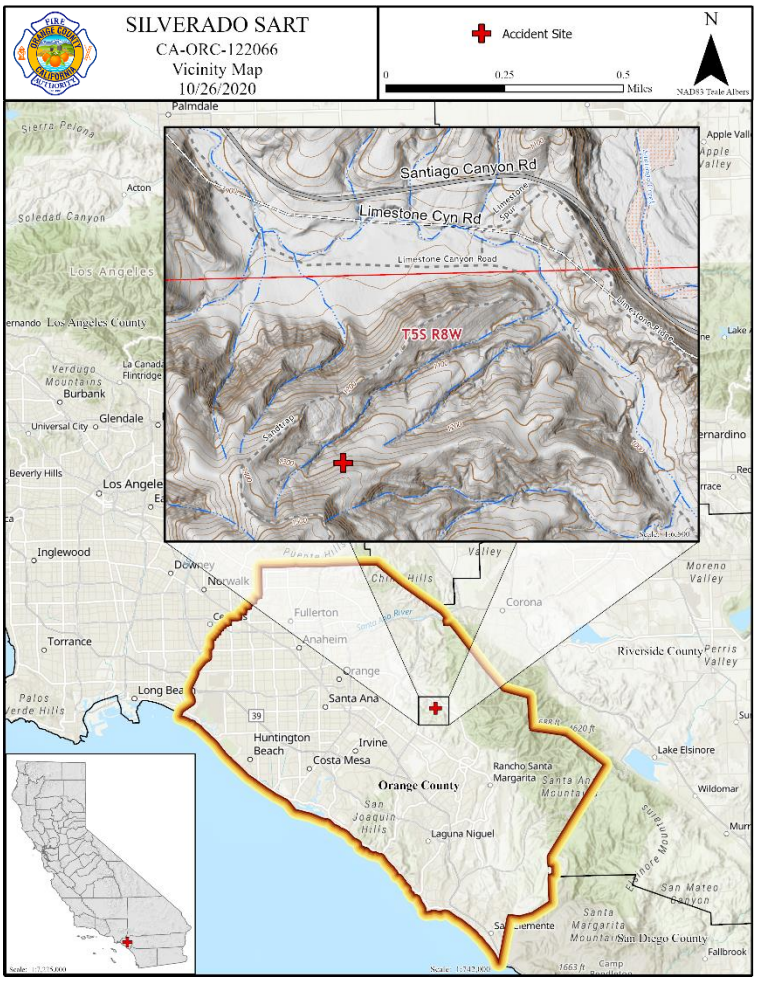
Fire Behavior:

- Spread Component is a rating of the forward rate of spread at the head of the fire in feet per minute. The Spread Component for the area was well above the 97th percentile at 313, and created historical levels for the 10 year period from October 1st to November 1st. The previous historical level for 2010-2019 was only 117. This high value is the main factor in the high rates of spread and long-distance spotting that occurred during the incident.



SEQUENCE OF EVENTS

On October 26, 2020, at 6:47 AM, the Orange County Fire Authority (OCFA) Emergency Command Center (ECC) received a report of a vegetation fire on Santiago Canyon Road in the unincorporated community of Silverado, CA.

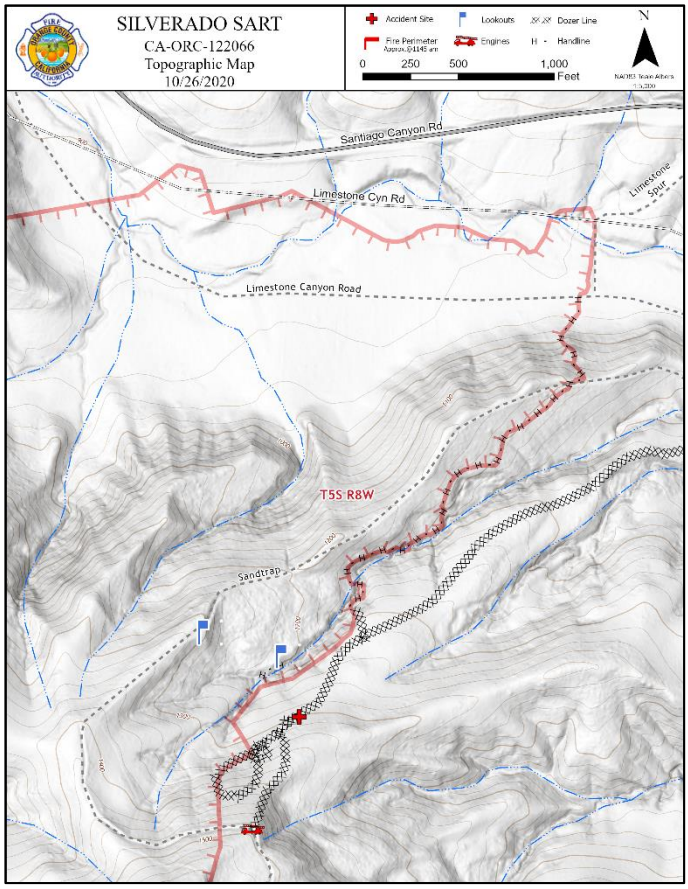


At approximately 7:12 AM, an OCFA Type I hand crew (C1), staffed with a Superintendent (SP1), an Assistant Superintendent (ASP1), two Squad Bosses (SB1 and SB2), and 13 Hand Crew Firefighters (HCFF) arrived at scene of the fire. The crew resources included two overhead vehicles and two crew transport vehicles.

SP1 arrived prior to the crew and began to scout the area to determine the best location for the crew to take action. The decision was made, due to terrain and fire behavior, C1 would be best utilized on the left flank in Division A. A second OCFA Type I hand crew (C2) arrived a few hours later and were assigned to Division A. Other resources assigned to Division A included local, state, and federal resources comprised of a state type III engine strike team, approximately ten local government Type I and III fire engines, two Federal Type III engines, a state bulldozer strike team, one single resource bulldozer, a safety officer, and a Division Supervisor.

SP1 continued to scout the division and served as a lookout (upper blue flag noted on Sandtrap road on the map). SB1 conducted a safety briefing with C1 before engaging the left flank in support of direct suppression operations where an engine company was engaged with a progressive hoselay. C1 began constructing handline along the left flank up and over a small ridge and down into a drainage. The bulldozer strike team working in the division was constructing an indirect control line (not on the edge of the fire), parallel and to the Southeast of the crews and the hoselay. The bulldozers were

able to tie their indirect line into a drainage where the hoselay and crews were working, then continued constructing indirect control line.



After tying in with the dozer line, ASP1 determined it was not safe to construct a direct handline along the drainage due to fire-weakened trees and burning debris falling along the fire's edge. C1 members continued out of the drainage along the dozer line with the hoselay. The dozer line C1 tied into was mid-slope, indirect fire line that continued approximately 750 feet until it tied back into the fire's edge. It was decided, due to the dozer line being indirect in that area, conducting a firing operation to remove unburned fuel between the mid-slope dozer line and the main fire was the best course of action. SB2 was posted in the black (burned area, lower blue flag on the map) on the opposite side of the drainage as a lookout.

The unburned fuel between the mid-slope dozer line and the bottom of the drainage consisted of a predominantly 1-hour fuel model. The distance from the drainage to the dozer line ranged from 250 feet to 295 feet. ASP1 contacted SP1 on the intracrew tactical frequency (a frequency used solely by the crew members) and asked if they could get approval to burn the indirect line. SP1 reported that Division A was good with the proposed firing.

Division A was aware a firing operation was to take place. No other resources on Division A reported hearing that the firing operation had commenced on the assigned division tactical frequency.

While crew members were gathering drip torches to conduct the firing operation, they observed the fire make a slope driven run from the bottom of the drainage to the area where the mid-slope dozer line transitioned from indirect to direct (video 1). This fire run resulted in a small spot fire located and contained by both bulldozers. After containing the spot, both bulldozers continued constructing direct line advancing up the ridge.

Map and VIDEO 1 (fire run prior to firing): Shaded area showing area to be fired by C1.

At approximately 11:42 AM, Crew members from C1 attempted to initiate the firing operation with drip torches; however, the wind was too strong and the drip torches would not stay lit. C1 transitioned to fusees as the ignition tool for the firing operation.

Under the direction of ASP1, a senior HCFF from C1 conducted a "dot" fire burning pattern, starting on the downhill side of the mid-slope dozer line. The firefighter worked downslope, paralleling the dozer line while the rest of the crew was spread out along the line and in the green, holding and monitoring the green for spot fires.

Based on witness accounts, in a time frame estimated from “during the firing operation” up to "five minutes" after the firing operation stopped. A few spot fires were observed across the line and were quickly contained by C1 members. At approximately 12:00 PM, one C1 member reported an additional spot fire (Spot Fire 1) across the line via the intracrew tactical frequency. C1 members, as well as engine firefighters advanced a charged lateral hose-line up to the heel of the spot fire, estimated to be 5-foot by 15-foot in size with a rapid rate of spread and approximately 80 feet into the green (unburned area) from the dozer line. C1 members applied water on the spot fire while other C1 members engaged with a chainsaw and hand tools. The spot fire was mainly burning in annual grasses, both standing and matted down, chamise, Black Sage, California Sage, Coastal Live Oaks, and Golden Bush.

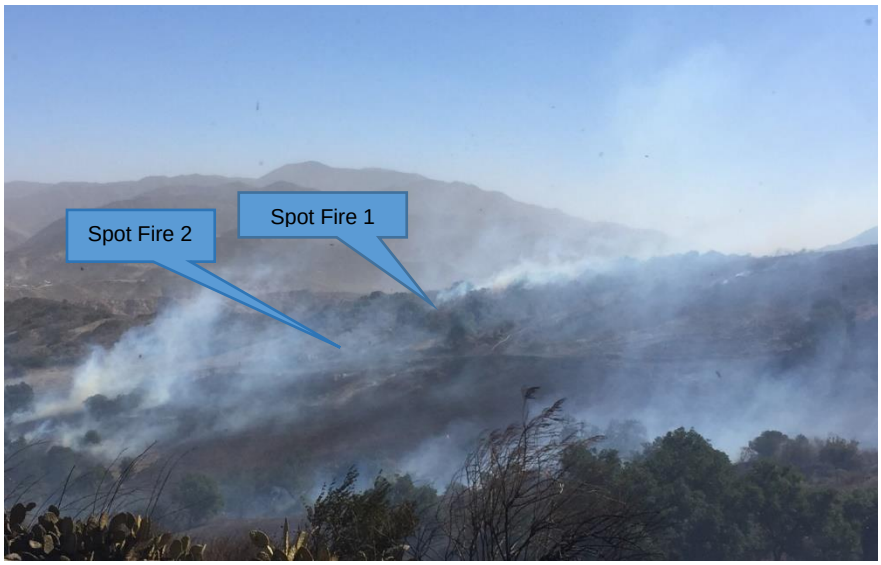


Photo: Spot Fire 1 engaged by HCFF's moments before Spot Fire 2 occurs

A total of eight C1 members made their way to Spot Fire 1, which had grown to approximately 100-feet by 100-feet in an estimated five to ten seconds. Three engine firefighters were also in the green, between Spot Fire 1 and the dozer line, assisting with the one-inch lateral.

Photo: C1 conducting the firing operation below the mid-slope dozer line.

Simultaneously, another spot fire (Spot Fire 2) was established downhill and upwind of the crew members working Spot Fire 1. A C1 member shouted, “Get out of there, there’s a spot!” The eight C1 members that engaged Spot Fire 1 and the three engine firefighters began to rapidly disperse out of the area and back down to the dozer line.

Five C1 members were impacted by radiant and convective heat, reporting singed hair, eyebrows, and eyelashes while stumbling out of the way of Spot Fire 2's advancing path.

The remaining three C1 crew members (HCFF1, HCFF2, HCFF3) were impacted significantly by Spot Fire 2's rapid spread.

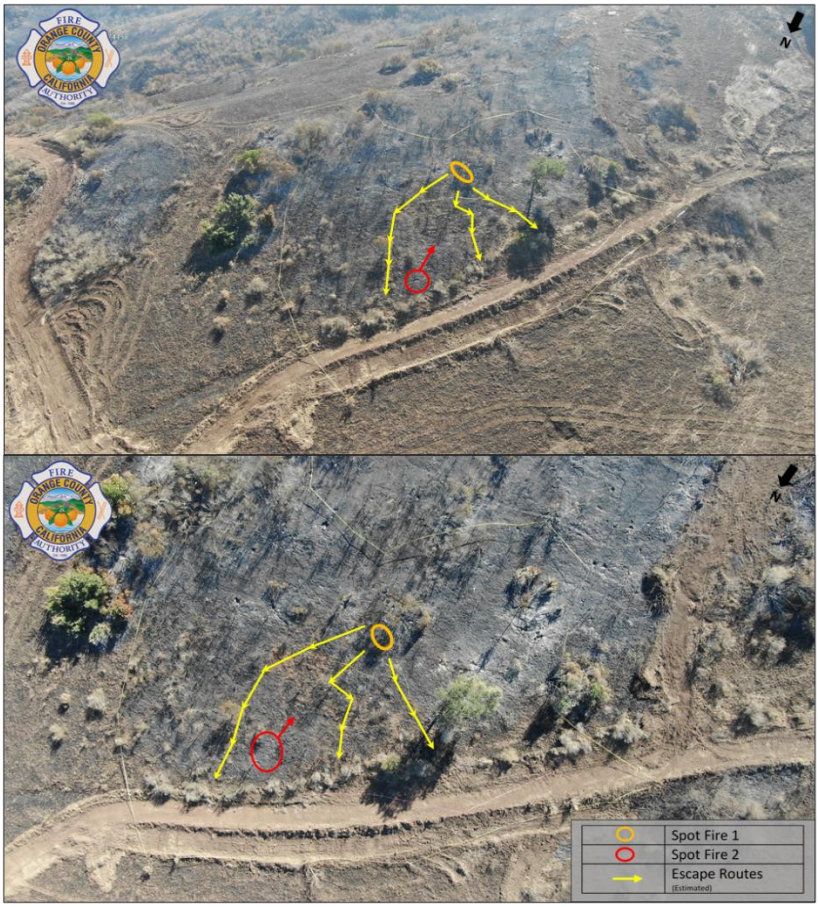


Photo and Videos: Spot Fires one and two with estimated escape routes (Video 2, Video 3)

HCFF1 was seen coming downslope, staggering out of the fire, critically burned with major burn damage to their Personnel Protective Equipment (PPE). Members from C1 and other fire engine firefighters working on the dozer line rushed to aid HCFF1. Approximately 30 seconds later, HCFF2 was observed on the edge of the Spot Fire 2 and was assisted down to the dozer line. HCFF2 suffered severe burns and major PPE damage. HCFF2 was provided aid by engine firefighters and C1 members. HCFF3 made it to the dozer line, narrowly escaping the impact of Spot Fire 2's rapid fire spread just prior to HCFF1 and HCFF2 reaching the dozer line. HCFF3 reported being exposed to extreme heat conditions resulting in singed hair to the head and arm. A C1 HCFF declared a "Mayday" on the intracrew tactical frequency. At the same time, a fire captain on the dozer line, radioed the emergency on the assigned divisional tactical frequency.

Firefighter paramedics on the dozer line, near the burn over, made their way to the injured HCFF's on the dozer line to render aid. HCFF1 and HCFF2 walked with assistance approximately 100 yards back down and stopped to be treated on the dozer line.

C2 Superintendent (SP2) and a Strike Team Leader (STL1) accessed the injured HCFF's in their utility vehicles by driving up the dozer line. HCFF2 was transported in SP2's vehicle with SP2 and one firefighter paramedic to Santiago Canyon Road at approximately 12:17 PM. Care was transferred to two firefighter paramedics. An ambulance was not yet on scene, so the SP2 vehicle, with the two paramedics, was utilized for transport to Orange County Global Medical Center, arriving at 12:32 PM.

HCFF1 was transported from the dozer line to Santiago Canyon Road by (STL1) with a firefighter paramedic. Care for HCFF1 was transferred to two firefighter paramedics assigned to medical on Santiago Canyon Road. An ambulance was still not on scene, so a decision was made to move HCFF1 to the back-cab of a fire engine to have a larger area for the paramedics to provide care and use the engine for transport. While HCFF1 was being placed in the fire engine an ambulance arrived. A decision was made to move HCFF1 into the ambulance for transport with the two firefighter paramedics and arrived at Orange County Global Medical Center at 12:57 PM.

INJURIES/DAMAGES

- HCFF1 suffered critical burn injuries and major damage to their PPE
- HCFF2 suffered critical burn injuries and major damage to their PPE
- HCFF3 suffered radiant heat injuries
- Additional HCFF's suffered superficial heat injuries

SAFETY ISSUES FOR REVIEW

Review 10 Standard Fire Orders

- Keep informed on fire weather conditions and forecasts
- Provide clear instructions and ensure they are understood
- Maintain prompt communications with your forces, your supervisor, and adjoining forces

Review 18 Situations That Shout Watch Out

- Safety zones and escape routes not identified.
    - These should be reevaluated as conditions and tactics change
- Instructions and assignments not clear
- Unburned fuel between you and the fire
- Wind increasing and changing direction
- Getting frequent spot fires across the line

Communications

- Radio operations on this incident were a challenge.
    - All personnel assigned to a division should be monitoring the division tactical channel and have the ability to call for assistance on the assigned frequency
- Consider developing a plan for an Incident Within an Incident (IWI) that has a common frequency for all units on scene and responding resources

Review - Common Denominators of Fire Behavior on Tragedy Fires

- This incident occurred:
    - On a small section of a large fire
    - In relatively light fuels
    - Responded to the uphill topographic feature

LESSONS LEARNED

- All Ten Standard Firefighting Orders must be observed while engaged in fire suppression activities.
- Evaluate topography when establishing control lines.
- Personnel must wear all approved PPE when engaged in firefighting operations.
- Recognize the alignment of the (fuel, wind, and topography) factors that influence wildland fire behavior.
- Recognize extreme fire behavior indicators and anticipate changing conditions.
- Fire conditions can rapidly change in light flashy fuels and will respond quickly to wind and slope.
- Use caution when working with fire below you.
- Your plan should allow for an unexpected and unpredicted shift in wind direction or wind speed.
- Fully brief crew and adjacent resources on the incident plan, including what to do if things go wrong.
- Analyze risk versus gain when developing a plan.
- Utilize an appropriate "Go / No-Go" checklist prior to conducting a firing operation and ensure it is communicated with all appropriate resources.
- Ensure standard procedures for an Incident Within Incident (IWI) are established.

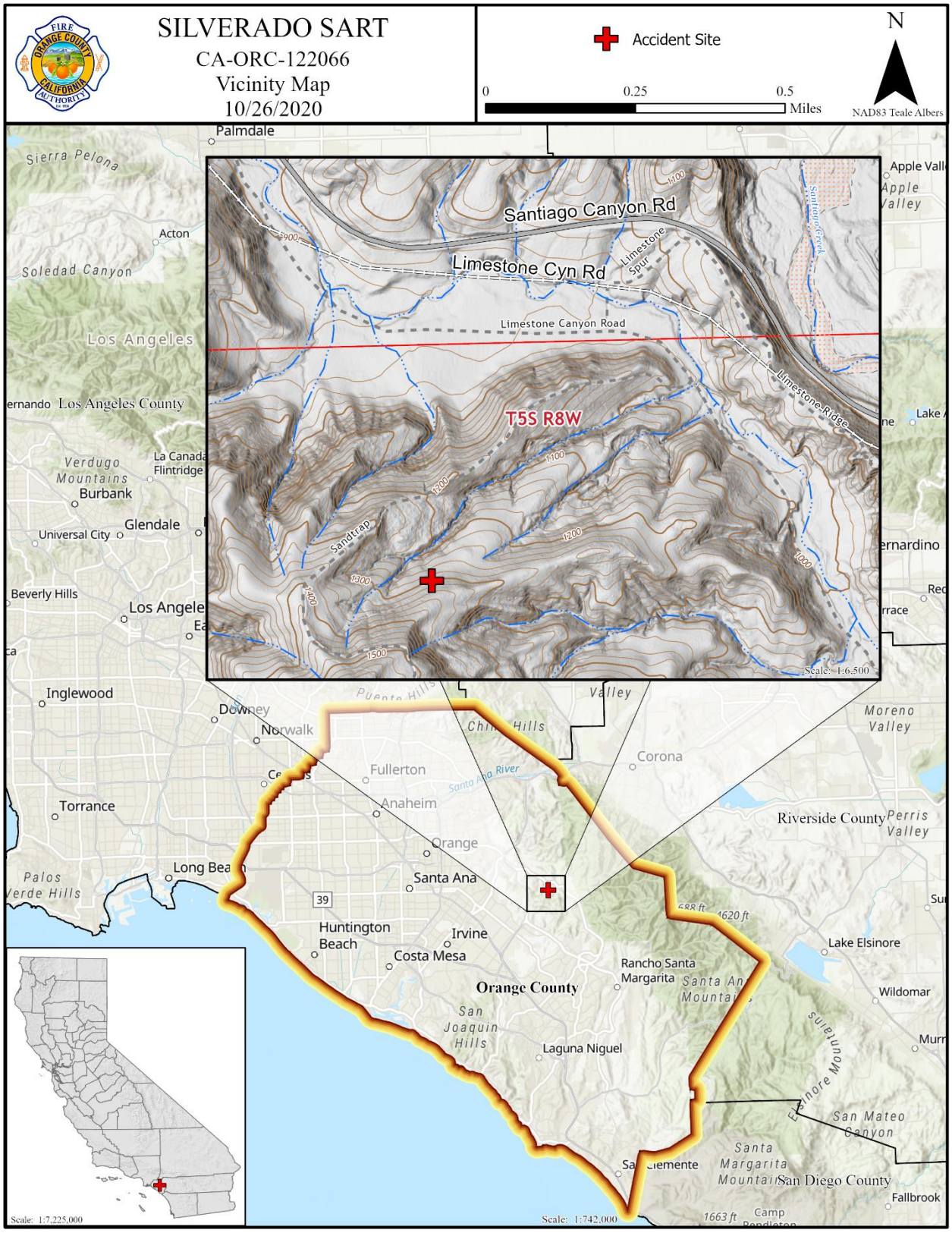
PHOTOS/SITE DIAGRAMS/MAPS

VIDEOS:

- 1.Fire Run Prior to Firing Operation- https://vimeo.com/477720033/b4733de30b
- 2.Drone High-level Fly Over- https://vimeo.com/477720156/33e40bc197
- 3.Drone Lower Fly Through- https://vimeo.com/477720159/5a4b5d5f69

*HCFF Personnel Protective Equipment after burn over. *PPE was exposed to extreme heat from direct flame impingement for an unknown duration **

*HCFF Personnel Protective Equipment (PPE) after burn over. *PPE was exposed to extreme heat from direct flame impingement for an unknown duration **


SILVERADO SART
CA-ORC-122066
Vicinity Map
10/26/2020
Accident Site
0
0.25
0.5
Miles
N
NAD83 Teale Albers
Santiago Canyon Rd
Limestone Cyn Rd
Limestone Spur
Limestone Canyon Road
Limestone Ridge
T5S R8W
Sandtrap
Scale: 1:6,500
Palmdale
Sierra Pelona
Acton
Soledad Canyon
Los Angeles
Los Angeles County
Verdugo Mountains
Burbank
Glendale
Universal City
La Canada Flintridge
Beverly Hills
Inglewood
Downey
Norwalk
Fullerton
Anaheim
Torrance
Orange
Santa Ana
Long Beach
Palos Verde Hills
Huntington Beach
Irvine
Costa Mesa
Orange County
Rancho Santa Margarita
Laguna Niguel
San Joaquin Hills
Lake Elsinore
Wildomar
Corona
Moreno Valley
Riverside County
Perris Valley
San Mateo Canyon
Santa Margarita Mountains
San Diego County
Fallbrook
Camp Pendleton
Scale: 1:7,225,000
Scale: 1:742,000

SILVERADO SART
CA-ORC-122066
Firing Operation Map
10/26/2020
Fire Perimeter
Approx.@1145 am
Dozer Line
Firing Operation
H - Handline
0 50 100 200
Feet
N
NAD83 Teale Albers
1:1,100

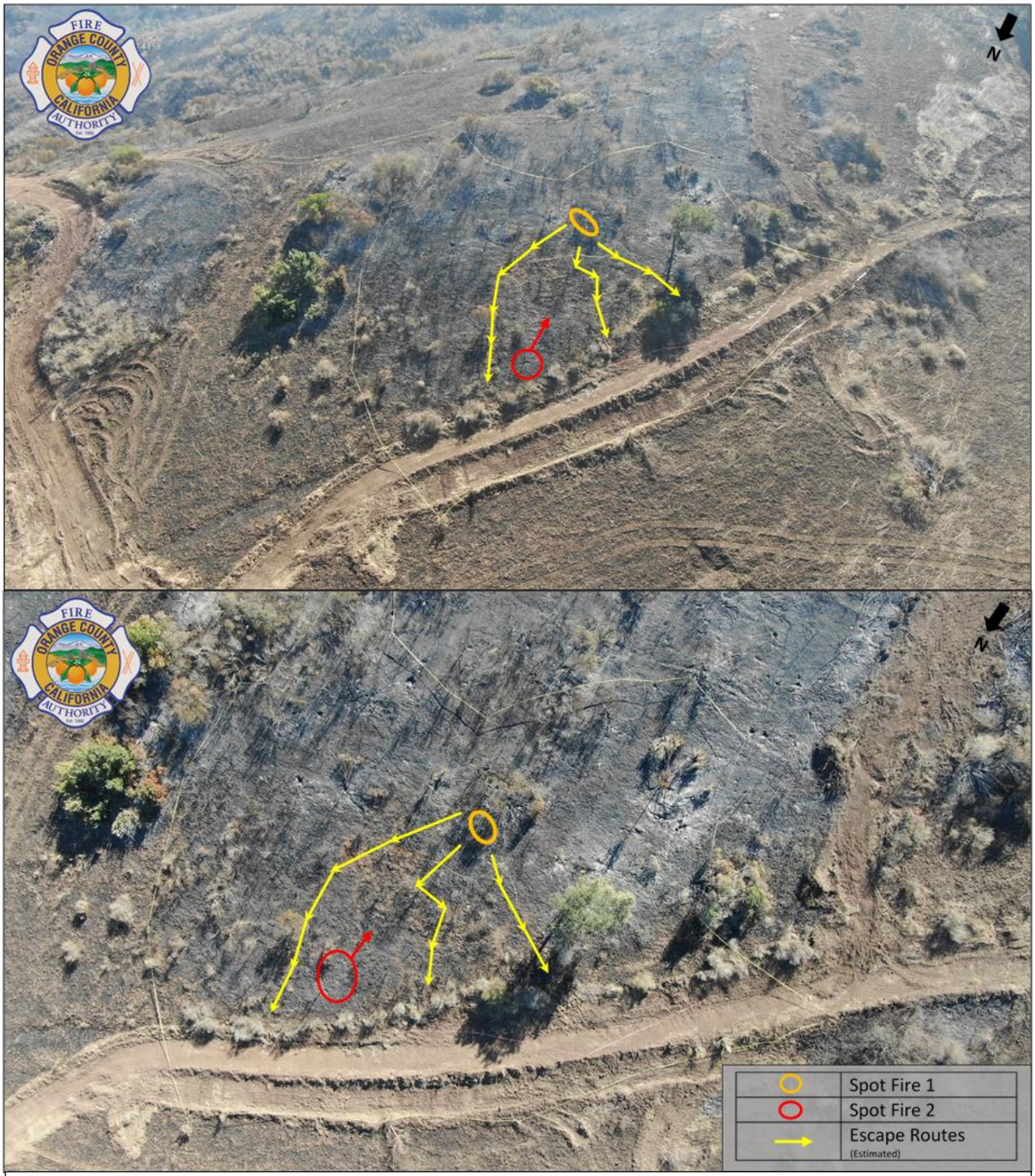


Photo and Videos: Spot Fires 1and 2 with estimated escape routes