



OPERATIONAL REVIEW

Lake Ōhau
Level 3 Vegetation Incident
F3088958
Lake Ōhau, North Otago
04 October 2020

Created by: Operational Efficiency
& Readiness
Fire and Emergency NZ NHQ

*Mā te mōhio ka anga whakamua
Through knowledge we improve*

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Executive Summary

In the early hours of 4 October 2020, a fire was reported northwest of the Lake Ōhau village. It was extremely windy with gusts peaking at 127km/hr recorded by MetService data shortly after the fire started. The wind was from the northwest and was driving the fire toward Lake Ōhau Alpine Village, a small settlement on the shore of Lake Ōhau. Approximately 10 minutes after this fire started another fire was reported at Livingstone, approximately 120km south east of Lake Ōhau. This placed immense pressure on the Otago Fire District resources, but they were well supported initially by the South Canterbury Fire District. Once a request was made for a National Incident Management Team further support was provided nationally.

The risk to Lake Ōhau village from a wildfire under certain conditions had been recognised as part of risk reduction work several years ago by previous rural fire authorities, who developed a tactical fire plan. The Waitaki District Council placed a fire siren in the village to alert residents if an evacuation was ever required. The siren was able to be easily activated by any resident or visitor to the village if they were aware of its purpose and location. The siren played a key role in alerting residents in the village of the need to evacuate immediately when a fire was noticed.

First responding crews to this incident were from Omarama and Twizel fire stations and they faced an unprecedented event in New Zealand. Thanks to the swift action of the Lake Ōhau residents responding under the tactical fire plan and with awareness of the potential risk they faced, an immediate evacuation commenced. When the fire appliances arrived the fire crews and Police Officer, with support from some residents still in the village, completed the final evacuations. All these actions ensured there were no fatalities from the fire.

Unfortunately, the fire resulted in the total loss of 48 structures, significant damage to a further six and approximately 5043 hectares of land being burnt.

Once alerted to the fires, the Otago Principal Rural Fire Officer took quick actions to get a National Incident Management Team (NIMT) activated to support firefighting efforts at Lake Ōhau. He passed the Incident Controller responsibilities to the NIMT lead and personally took responsibility for the recovery role. The NIMT was supported by the Te Kei and Te Ihu Regional Coordination Centres (RCC's), and many other Fire and Emergency NZ personnel who responded in either support or direct firefighting roles. The incident was further supported throughout by the two local volunteer brigades and their members' respective employers. The Waitaki and Mackenzie District Councils, partner agencies and contractors providing ground and air machine capability also supported this effort. All this activity contributed to a well-resourced and coordinated incident that prioritised the community as its focus throughout.

The fire continued for nine days before it was fully extinguished. There are no major recommendations from the review. The review's commentary identifies areas where management can focus for continuous improvement.

Operational Efficiency and Readiness

The purpose of Operational Efficiency and Readiness (OER) is to provide operational assurance advice to the Deputy Chief Executive Service Delivery (the National Commander) to ensure they achieve their responsibilities for the operational efficiency and operational readiness of Fire and Emergency New Zealand (FENZ).

OER is independent, objective and provides quality operational assurance advice to support continuous improvement regarding the operational efficiency and readiness of Fire and Emergency New Zealand.

Purpose of Review

An Operational Review examines how Fire and Emergency responded to substantial, significant or unusual incidents to enable continuous improvement. While it considers the application of policies, procedures and operational instructions (as they applied to the event), its primary focus is to assist officers' and firefighters' learning by sharing knowledge and experiences gained through real incidents.

A review focuses on the facts and does not provide conjecture or alternative opinions. The review identifies critical findings to inform Senior Managers where improvements are needed or there is a need to develop corrective actions. It identifies general findings related to strategy, tactics, leadership, agency and community engagement and/or activities that worked well to support organisational learning.

All incidents should have a hot debrief, and significant incidents will get a formal debrief facilitated by a suitably qualified person. This debrief is required to be written down in the form of an After-Action Review (AAR) and will be used as evidence by the review team.

Few reviews of emergencies, undertaken with the benefit of hindsight, would not identify lessons for the future, and this is one of the main reasons to carry out reviews of this nature. Therefore, our comments and observations should be read in the spirit that they are intended, which is to support continuous improvement of service delivery to the people of New Zealand.

Once approved by the sponsor, all reports are published on the Operational Efficiency webpage for all to read and share.

Methodology

The review team use the Incident Cause Analysis Method (ICAM) as a guide to conduct operational reviews.

The content contained within this report reflects the information provided to the team through debriefs, interviews, and data collected through Fire and Emergency reporting systems.

Review Requested by

Region Manager Te Kei Mike Grant

Review Team

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Environment Description

Lake Ōhau

The Lake Ōhau area consists of high-country and flat-to-rolling farmland, conservation areas, a large lake, and a small residential area referred to as Lake Ōhau Alpine Village. The village itself consists of single and two storey residential dwellings with a mix of permanent residents living alongside properties used as holiday homes, some of which are rented short term through commercial holiday accommodation websites. Properties are well maintained and mostly of a modern construction.

The village is extensively landscaped with plants ranging from grasses and shrubs through to pockets of pine and spruce. Lake Ōhau attracts many visitors and in the high tourist season most of the properties will have people staying in them. The Ōhau ski field is on the doorstep and the Lake Ōhau Lodge a few kilometers north west of the village has facilities to accommodate over 100 people. There is only one road in and out of the village that is accessed from State Highway eight (SH8) separating the towns of Omarama and Twizel. The road from Lake Ōhau village intersects SH8 approximately midway between these two towns. It sits on the boundary of the Waitaki District and the Mackenzie District with Twizel providing the main facilities to support the wider community.

The farmland generally consists of grass pasture and shelter belts of various vegetation types. The Department of Conservation (DOC) estate, as well as privately owned land, mainly consists of tussock, commercial and non-commercial forest, native bush and beech forest at higher elevations.



Fig 5 Lake Ōhau prior to the fire highlighting the terrain.



Fig 6. Lake Ōhau village prior to the fire



Fig 7. Wider perspective of the village and showing direct surrounds

The Event

Lake Ōhau, day one

Early on the morning of 4 October 2020, around 1:10am, a resident of Lake Ōhau Alpine Village who [REDACTED] received a phone call from a [REDACTED] who was due to start work at 2:00am. He said a fence had blown down due to the high winds and was wondering what to do. At this time wind gusts approaching 100km/hr were recorded for Lake Ōhau. A maximum wind gust of 127.3kph was recorded at the Pukaki Downs portable weather station between 3:00am and 4:00am. This was when the fire began which caused so much destruction in the village. These winds continued around 50kph for most of the day until around 6:00pm when they died down to below 25kph. The [REDACTED] [REDACTED] was wondering whether to go up to the ski field to start work despite the high winds. He called again a short time later and was advised that it was too windy and would not be safe to do so, with the wind from the west northwest.

At 3.06am the first 111 call was made to the Fire Communications Centre. Sometime around 3:00am the [REDACTED] was woken by the civil defence siren in the village, which another resident had activated. He then heard yelling and screaming, and another resident appeared, and told him there was a massive fire that was travelling quickly toward the village. He proceeded to do a circuit around the village, noticed many people were leaving, and advised those he met to evacuate immediately. By this time there were showers of embers all over the village. He headed to the most at risk properties first and was able to ensure all occupants had safely evacuated. He then met up with the Omarama Police Officer who had responded when alerted to the fire by the Police Communications Centre. Together they worked to try to ensure all properties were evacuated. The Police Officer advised residents to evacuate to the community hall in Omarama.

This work was not done alone. Several other residents were also trying to alert people to the danger, including one who was driving around the streets using the horn on their vehicle. The civil defence siren had been installed by the Waitaki District Council as part of a village safety plan and any resident was able to activate it. They had also installed fire boxes and each year the residents would have a training day with Fire and Emergency NZ personnel. But the fire was too big to even consider using any of these and the usual meeting point was not accessible due to the fire.

There is only one way in and out of the village and many residents had evacuated this way. But as the fire intensified this became more hazardous. Residents then headed toward the Ōhau Lodge which was about 5km northwest of the village. The lodge had around 100 guests who were advised to stay where they were as this location was considered safe from the fire. It was presumed that every house had someone in it, so all possible houses were checked unless already involved in fire and not safe to do so. It is clear to the review team that several lives may have been lost without this effort from the residents, the Police Officer, and subsequently the first arriving fire crews.

At 3:06am the Southern Communications Centre (SouthCom) received a 111 call from a resident in Lake Ōhau reporting pine trees on fire behind the village. This was to the northwest of the village and a very strong westerly wind was moving the fire toward the village. SouthCom dispatched Twizel 9011 (TWIZ9011), Omarama 5611 (OMAR5611), and Omarama 567 (OMAR567). SouthCom were advised that the wind was very strong and the fire was moving quickly toward the village. A resident advised they had activated the village emergency siren and another resident was driving around using their vehicle's horn to wake up all the occupants so they could evacuate.

The first responding appliance, OMAR567, advised SouthCom they were short crewed and requested them to attach Omarama 5671(OMAR5671) and requested further information. He was advised the fire had doubled in size and was heading toward the village, and evacuations were taking place. He observed as he drove down the road toward the village a stream of vehicles leaving and a lot of smoke but no sign of the fire. For safety reasons he also alerted SouthCom to warn further responding appliances about the number of vehicles on the road leaving the village. Based on the information provided by SouthCom he requested they contact Police and transmitted a second Alarm. A second alarm had also been requested by TWIZ9011, but this was passed via LMR to Twizel fire station and was not heard by OMAR567. The OIC of OMAR567 was aware they were the only pump attached and he wanted at least another two pump appliances.



Fig 1 photo of the fire approaching the village (source Stuff)

As Omarama is in the Waitaki District and Twizel is in the Mackenzie District, the brigades were in separate FENZ regions. The fire was in the Te Kei fire region which includes the Omarama brigade, while the Twizel brigade is in the Te Ihu fire region. This meant the fire appliances operated on separate land mobile radio (LMR) fire channels as these channels are shared with Police. This proved to be a problem in the very early stages of the fire as some radio communication between the Omarama and

Twizel appliances was missed. Therefore, both transmitted second alarms not realising the other had. But once in the village all appliances operated on a single channel and appliance to appliance communication was done over the IGC radios or via mobile phones.

Because the shared LMR channel was very busy many messages in the early stages of the incident were relayed to SouthCom via mobile phone so were not heard by other responding crews. The second alarm had triggered the response of the nearest Command Unit, Timaru, in the Te Ihu fire region. Due to a local procedure in South Canterbury where the duty commander responds when the Timaru command unit responds this activated the immediate response of the Timaru-based on-call Assistant Area Commander (AAC).

On entering the village, the OIC of the Omarama appliance advised the crew that their priority task would be evacuations, not firefighting. At this time the fire had not yet reached the houses. The OMAR567 OIC realised the enormity of the incident they were facing and immediately transmitted a third alarm. The next arriving appliance shortly after OMAR567 was TWIZ9011, a tanker. The OIC was concerned about who was liaising with residents and occupants about evacuations, was aware there was a special response plan for the village but did not have access to it on his appliance. Realising the Deputy Principal Rural Fire Officer (DPRFO) would probably have a copy, he requested his attendance. He also requested contact be made with Civil Defence as he knew evacuees would need somewhere to gather and be looked after. He also wanted to ensure there was an accurate system to account for everybody or identify who might be missing. He was aware the Omarama Police Officer had responded and spoke to him through his mobile phone and was informed he was already on the road into the village. The Police Officer had been woken by the Omarama fire station siren and a short time later received a phone call from the Police Communications Centre about a large fire threatening the village and was requested to assist with evacuations. While heading to Lake Ōhau he advised people he saw leaving the village to congregate at the Omarama Community Hall. When he arrived in the village, he began to assist a resident who was concerned about a property under threat with a strong likelihood that the occupant was still inside. The Police Officer broke into the house where they found the occupant was still there and were able to evacuate him as flames were encroaching on the house. When the Omarama fire appliance arrived the OIC met the Police Officer and after a brief conversation they set about ensuring the complete evacuation of the village.

The initial strategy was to ensure evacuations were complete and not consider firefighting until they were sure everyone was safe and accounted for. The OIC had observed from the flames and wind that it was too dangerous to get close to the fire so planned to withdraw to a place of safety and review strategy and tactics once the evacuations were completed. They decided to start at the top of the village and work their way down as this was the closest to the fire they could safely get. Using their loud hailer, and appliance sirens, both appliances drove around and started informing those occupants still in the village to 'evacuate the village, there is a large fire coming, evacuate the village'. They then focused on checking as many properties as possible, supported by several members of the community.

Rescuers (fire, police and members of the community) worked hard to ensure they had evacuated all occupants. As conditions quickly deteriorated and being reasonably certain that everyone had been evacuated safely a decision was made to withdraw to keep rescuers safe. They located to a defensible space to keep emergency responders and community members assisting the evacuation safe from the intense fire. A third alarm was transmitted as there were many structures under threat and the officer from Omarama decided that BA capable appliances and crews would be required for structure protection while other crews fought the vegetation fire. This was also an opportunity to ensure SouthCom understood they were now dealing with significant structural fires as well as a large out-of-control vegetation fire. The Omarama OIC was concerned that the scale of the incident was beyond his level of training and experience. He was advised the Chief Fire Officer from Twizel was responding and would arrive shortly to take over command.

The fire had intensified in the village, fuelled by both structures and vegetation, and crossed the road at Lake Middleton which was before the entrance to Lake Ōhau Alpine Village. This meant there was now no escape from the village in the direction of Omarama and Twizel. It also meant it was very risky for further responding appliances to reach the crews already in the village. The OIC informed the chief fire officer of the Otematata appliance of the danger in trying to enter the village and requested that he coordinate a roadblock until it was safe to re-enter the village.

The OIC at one stage retreated all appliances toward the Ōhau Lodge for safety reasons. At this time the Lodge had over a hundred guests plus evacuees from the village, who had been advised to evacuate to the lodge as it was a safe location from the fire. The lodge was familiar to residents but its location was not known to many people who had rented houses in the village for a holiday stay.

The Twizel deputy chief fire officer (DCFO) was OIC on the pump appliance from his station that responded on the second alarm make up. While still en route he had a quick conversation with the OIC of OMAR567 and stopped to speak to a person on the side of the road near [REDACTED], referred to as [REDACTED], who advised the fire was threatening their property. With the advancing fire moving toward this [REDACTED], the DCFO decided to locate there and try to defend these properties using the resources at his disposal. He advised the Omarama OIC that he would stay where he was so wouldn't take command but was aware the Twizel CFO was responding. At this location he was supported by the Omarama tanker, OMAR5611 and a while later the Twizel tanker, TWIZ9011 was also sent as additional support. They were able to provide safe locations to work while protecting properties [REDACTED]

The chief fire officer (CFO) Twizel responded in the station utility and arrived close to Lake Middleton but was unable to proceed for about 3 minutes due to flames blocking the road. He drove to the location where the crews had gathered just north of the village. When he arrived, he met the OIC Omarama, who was still in charge. They conferred and the OIC Omarama gave him a quick brief of what the situation was, what actions had been taken, current tactics implemented, and what the OIC saw as the immediate priorities. The OIC also advised he had sectorised the village. The CFO assumed the role

of Incident Controller (IC) and requested a firefighter to accompany him to act as his scribe and start to document all personnel who were on site. A BA tally whiteboard was used to record people's names. From his discussion with personnel on site (including some residents and the Police Officer), as well as the handover from the Omarama OIC, he was reasonably confident they had managed to get all residents out of the village safely.

At this time there appeared to be flames all around them and he wanted to get into the village to be able to assess how safe it was to put crews in to protect and/or extinguish properties already on fire. He proceeded in the station utility into the village with a firefighter beside him and followed by the Twizel rural team in a medium appliance as protection. Once in the village he assessed it was safe to bring crews in. He tasked his crews to work to save as much property as possible with the resources they had but not to attempt to enter any structures. He was very familiar with Lake Ōhau village as he had [REDACTED]. At this stage, with very limited resources available, there was no formal IMT structure in place other than the Chief Fire Officer assuming the role as IC. He required all crews to have safety briefs and welfare checks every 10 minutes. He appointed safety officers and established a system so if any teams felt unsafe, they would sound their appliance siren and all crews would retreat. Two sectors were established, one being the estate by Lake Middleton and the other being the village. He requested an officer at Twizel fire station to start to get food for crews, with the local bakery opening up and providing this.

While the IC continued to manage the efforts in the village, the AAC from Timaru arrived. As he made his way toward the village to find the IC, he came across the team protecting Shelton Downs. It was a very intense scene but had a sector Commander and Safety Officer in place, so he continued toward the village. He was ahead of the Command Unit so found a good location for it to establish as a forward control point. While this was setting up a DPRFO arrived. With the amount of structure protection happening at this time it was decided the AAC would take charge, he would appoint the CFO Twizel (still IC) into the Operations Manager role and the DPRFO as Safety Advisor. He met the IC near the entrance to the village. The IC had designated a firefighter to act as his scribe and had this person recording key decisions and starting to develop an accountability register of as many personnel on the incident ground as possible. He was asked to get this information transcribed into the Command Unit and then to assume the role as Operations Manager. He was requested to ensure there was a safety officer for both sectors.

The new IC was advised they would need helicopters at first light to fire the vegetation fire. In the meantime, the strategy was to protect unburnt structures and extinguish structures still burning. As more resources and executive officers arrived a formal command structure was developed, initially working out of the Command Unit. In the meantime, the IC had a briefing with his safety advisor and operations manager and commenced planning for the arrival of the helicopters at first light.

The CFO Twizel committed the Twizel brigade for several days to assist operations, a decision supported by local employers of the volunteers involved. Throughout the first day all fire fighters involved in the response worked very hard to save as many structures as possible, led by the Omarama

and Twizel brigades. They had a range of issues and challenges to confront and resolve and were very aware of the dangers around them. As dawn arrived and daylight ensued, the focus of the IC moved from being solely on the properties in the village to containing the vegetation fire. He had the Command Unit from Timaru at his disposal and set about to create a structure for the fireground and ensuring there were safety officers appointed for each sector he had created. The strategy for ground crews was to protect unburnt structures and extinguish structures still burning.

The first helicopters arrived at Lake Ōhau as soon as daylight permitted them to fly. When they arrived, there was some concern whether they would be able to fly safely due to the high winds. However, they located a suitable location as a base and agreed to fly. An air attack function was established around 8:30am. Aerial attack commenced almost immediately to try to contain the spread of the fire. The focus was on the wildfire as there were ground crews working to protect as much as they could in the village itself. Most helicopters were dipping their buckets in the Lake as it was a large and immediate water source.

The Otago Principal Rural Fire Officer (PRFO) had been advised that a fire had ignited in Livingstone, also in the Waitaki District, shortly after the Lake Ōhau fire was notified so he contacted the Region Coordination Centre (RCC). He was advised by the Te Kei Region Manager to locate to the RCC to ensure planning was undertaken for the provision of resources to support both incidents. While in the RCC he requested the activation of the USAR team as he had concerns around the level of property damage they may encounter. With two significant fires burning and concern about how stretched the region's resources would be, especially if a third fire broke out, he requested the activation of a National Incident Management Team (NIMT) while responding to Lake Ōhau. He was advised the duty team was based in Tauranga so he suggested they notify the nearest team based out of Timaru. He was certain the Mid-South Canterbury PRFO who leads the South Island based NIMT was available. He knew this team could get to the incident swiftly, which would be crucial for this fire. The PRFO in Timaru, who leads this NIMT was notified, and had his team activated. Most of them arrived in Twizel in the late afternoon.

When the Otago PRFO arrived at Lake Ōhau, he formally appointed the leader of the NIMT as the IC and assumed the role of Recovery Manager himself. He flew over the scene to gain situational awareness and then returned to meet with the planning team and pass on his thoughts around strategy and tactics. He had requested the Urban Search and Rescue (USAR) drone team fly over the scene to ensure there were no casualties and to assist in assessing the situation in the village. From then on, he assumed the Recovery Manager role throughout the incident and in the following weeks.

Working in the Command Unit at the Incident Control Point (ICP) the IC, Otago PRFO (now Recovery Manager) and a Planning Manager who had arrived from Dunedin started to prepare an incident action plan (IAP) for the following day. This work was completed that evening to ensure there was an IAP for the next day shift. The IC knew that he would need better facilities to accommodate a full IMT that would include a range of agencies as well as FENZ. The IMT was initially set up in a spare office in the DOC base in Twizel and later a full IMT was set up in the Twizel Fire station. The Twizel fire station was

initially used as the Incident Control Point (ICP) and the Command Unit remained at Lake Ōhau as the Forward Control Point (FCP). The full NIMT was assembled by 10:00pm and ready for a briefing at 7:00am the next day. The Otago PRFO had assumed the role of Recovery Manager and began to work with the affected residents, council and other agencies involved and start the recovery process.

Several commanders had also responded to support the IMT as well as the Southern Base USAR team. They provided drone capability to map the fire as well as a Rapid Disaster Assessment team (RDA) to assess the damage and the state of structures in the village. The USAR drone team operated during the hours of darkness so they didn't interfere with the helicopters being used to fight the fire. They were also able to provide new intelligence for a review of the IAP.

During the initial planning, relief crews were organised so ground crews were available throughout the night to provide structure protection and direct attack if required. They were also able to monitor the wildfire during the night in preparation for an intense attack on the fire to resume at daybreak. Volunteer crews had worked long hours in arduous conditions and appreciated the relief overnight but were keen to be back the next day as it was their community impacted.

Meanwhile, the Recovery Manager had begun meeting evacuees from the village, who had gathered at the Twizel Events Centre, where they were initially looked after by the Mackenzie District Emergency Management Officer and Welfare Team, The meetings were naturally fairly tense at times, as residents and property owners wanted and needed information about their properties.

Day two

The IAP for day two was to continue structure protection, direct attack on the wildfire, and mop up where possible using ground crews and air resources. Helicopters using heli-buckets began water drops under trying windy conditions as soon as they were able to get into the air and ground crews continued fire suppression activity in the village itself.

Though not as intense as day one, it was still a very active firefighting day. Media attention had started to worry the residents, who were naturally concerned about the state of their properties, with photos already starting to emerge on social media..

The Recovery Manager had already begun to work with the IMT Public Information Manager (PIM) to plan a way to be able to take the residents into the village safely so they could see for themselves the state of their properties. Three buses were organised to take the evacuees for a drive through the village to view their properties. The USAR drone team took an aerial photo of the village so it could be shown to the residents while on the buses and help prepare them for what they would see. Each bus had a senior FENZ representative and victim support on board. Media as well as insurance companies and their investigators were also keen to get in and view the destruction but were advised that the residents were going to get the first opportunity to see for themselves Once the three buses with evacuees returned to Twizel, media were taken to the village by bus an hour later with the Recovery Manager

and other senior personnel to answer questions. The Ministers of Emergency Management and Conservation were also provided with briefings and were escorted to the fireground.

Ground crews remained on scene overnight to carry out structure protection, monitoring and direct attack as required. A dedicated liaison was set up with Waitaki District Council for assistance in the recovery process and community engagement. This event was such that Government agencies, national bodies, and FENZ were assisting where necessary until the impact of this fire was better understood.

Day three

Day three consisted of structure protection, direct attack on wildfire and mop up using ground and air resources, as well as building up resource capacity for a campaign fire. A fire investigation team began work and structural assessments were commenced.

Ground crews remained on scene overnight to carry out structure protection, monitoring, direct attack of threatening hotspots and mop up as required.



Fig 2. & Fig 3. Photo once fire suppressed

Day Four to Nine

From day four onward strategy and tactics consisted of structure protection and mop up on the wildfire using ground resources and machinery. Some rehabilitation was implemented while handover and demobilisation plans were developed for the respective organisations.

Regular meetings continued with the residents and a managed access system was developed to enable them to retrieve essential belongings from undamaged properties and sift through their destroyed properties if safe to do so to find any important items that were salvageable.

The IMT included personnel from several agencies supporting FENZ. Department of Conservation provided administration support including the Finance function. A recovery plan was prepared to hand over to the Waitaki District Council Recovery Manager. Coast Guard were engaged to protect the area of the lake being used to dip the heli-buckets to keep sight seers and local boats away at a safe distance.

The fire traversed the boundaries of two District Councils, Waitaki and Mackenzie. Although the fire was in the Waitaki District a lot of the resource and support, including initial community welfare, was provided from Twizel in the Mackenzie District. Using CIMS principles the incident was managed in a coordinated and cooperative manner with a focus on those most affected, ie the residents and property owners of the village and the surrounding landowners impacted by the fire.



Fig 3 and 4. Mop up with unburnt ground cover in foreground



Fig 4 Aerial view during mop up

The Review

This section outlines the findings from the operational review based on the terms of reference. Generally, the findings are grouped chronologically under the "4Rs" headings; Reduction, Readiness, Response and Recovery.

Reduction

Inter-agency and Stakeholder Relationships

Our findings

Prior to the formation of FENZ the Otago Rural Fire Authority had recognized the wildfire risk to Lake Ōhau Alpine Village and had developed a specific tactical plan. In addition, fire boxes had been installed around the village containing small diameter fire hose to allow the residents to extinguish a small fire. Training on the safe use of the fire hose was conducted annually and was scheduled to occur in 2020 not long after the fire occurred. As it transpired this hose would not have been of any use for the fire that overtook the village.

The fire danger rating was regularly notified as were spike days (days when due to extreme weather events, for example strong winds, the fire danger is elevated into the extreme category) so people would be aware to take extra precautions, and know when a total fire ban was in place. Evidence indicates that the Otago team were well connected with the various agencies, had arrangements with contractors they may need to utilize in the event of a fire, and had liaison with landowners to discuss reduction

activities. Fire permitting was one avenue used to ensure landowners were aware of the risks of activities on their land related to fire.

The Waitaki District Council had installed a community siren aligned to the tactical plan to support an evacuation if required. A copy of the plan was put in every home, but knowledge of the plan was mostly only fully understood by the permanent residents. With many of the properties being used as holiday rentals, a significant number of people staying in the village at any given time would not be aware of the plan, and/or what action to take if they heard the siren. Visitors would not know that any person could activate the siren if they felt there was a significant risk to the village.

The relationships at a local level between FENZ and other emergency services such as Police, St John and Civil Defence was well formed and people knew each other so were able to focus very quickly on the community. And importantly, the community knew them so had trust in the advice given.

Fire Cause and Determination

Our findings

A Senior Specialist Investigator and a local Specialist Investigator were assigned to determine the cause and origin of the fire. The result of the investigation is contained in a separate 'fire investigation report'.

Fire Season Promotion

Our findings

The fire season at the date of the incident was designated as an open season, and the daily Fire Weather Index observed was moderate. The fire danger sign located at Twizel was on moderate as was the sign at Omarama.

Despite these conditions there had been an unusually high number of wildfires throughout Otago, so the District was on high alert and managers were quick to respond to any fire notifications they received. On the night of the Livingstone and Lake Ōhau fires it was extremely windy, so fire crews and managers were expecting the worst if fires did break out.

Fire Behaviour

Fire behaviour is determined by the surrounding conditions, influences and modifying forces of topography, fuel and weather.

There were no calibrated Fire and Emergency Remote Automatic Weather Stations (RAWS) in the Ōhau area. Wind speeds taken from three other RAWS stations provided some idea of what was occurring on the night. As these are some distance away, they may not provide a true reflection of what was happening in the Ōhau area.

With average wind speeds of around 50kph gusting over 100kph the fire's Rate of Spread (ROS) once established and running at its equilibrium was extreme.

Contributing factors for the fire to spread were:

- Weather: strong winds making this a wind driven fire.
- Time of day: fighting any fire is dangerous but fires at night create many more safety issues for responding crews. The crews that responded to this fire put themselves at great risk to save what was saveable. These dangers not only came from the fire itself but from flying debris such as roofing iron.
- A high available fuel load (AFL): grass, scrub and forest fuels.
- Topography: steep mountains, gullies squeezing the wind and increasing its speed as it blew down across the lake.

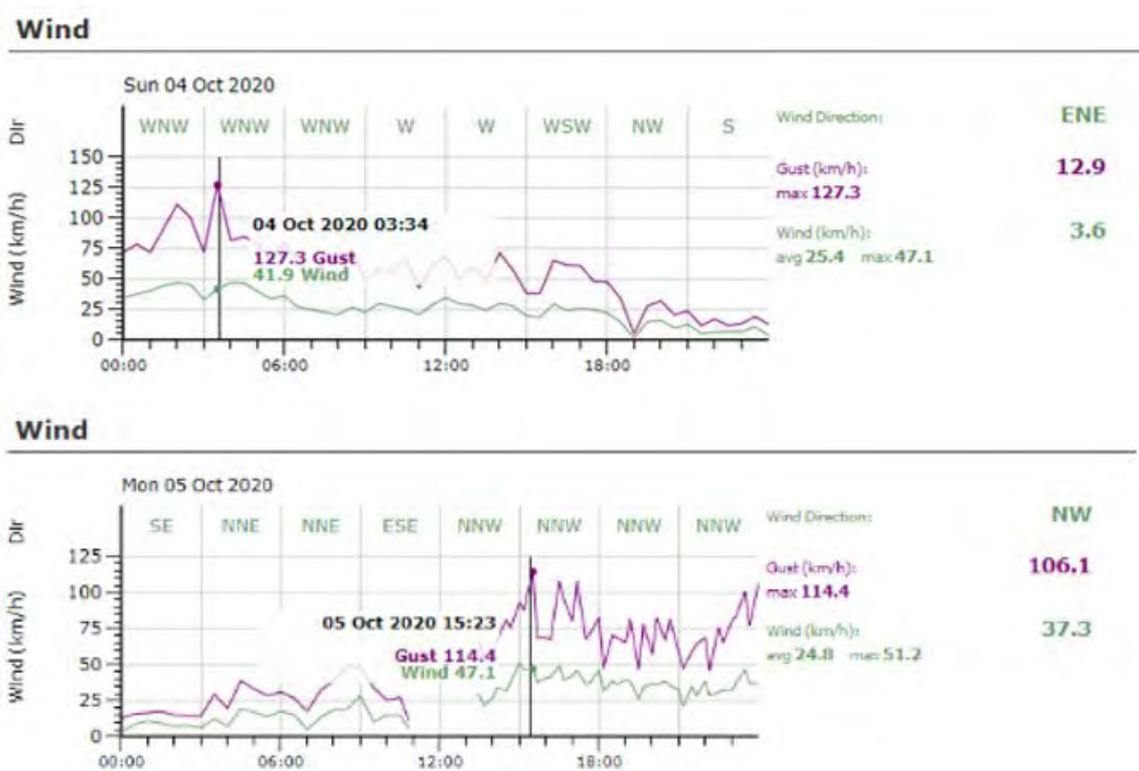


Fig. 22. Mid-South Canterbury Portable RAWS wind graphs above.

On the night of the fire the Mid-South Canterbury RAWS was located at Pukaki Downs. From Lake Ōhau the RAWS was approximately 25km away to the north east.

The RAWS was relocated to Ōhau on 5 October, where it was recording data on site by 1:30pm.

More detailed weather data that all contributed to the intensity, speed and direction of the fire is included in Annex A.

Readiness

Pre-incident Planning and Intelligence

Our findings

Otago District traditionally experiences high fire danger during the hot dry summer months. FENZ maintains an up-to-date fire plan that is reviewed prior to the 'fire season' commencing. This planning includes consideration of the predicted weather patterns and the likely impact on fuels and resources.

Lake Ōhau Alpine Village had been identified as one of several high-risk areas in Otago that could be vulnerable to a wildfire. This is due to their unique and often remote locations, life risk with possibility of entrapment, vegetation fuels, terrain, high values, and the extreme weather conditions often experienced in these areas during the height of summer. These locations all have a specific tactical plan to be used in the event of a fire breaking out.

This risk for Lake Ōhau is exacerbated by the frequency and strength of the predominant northerly wind and the hot dry days it experiences throughout summer. Any fire in this landscape on a windy day is likely to be moving very fast and of high intensity, thus the risk of entrapment in these conditions is high. The plan considered an elevated response based on alarm levels. So, the early transmission of a second alarm will have triggered the response of three helicopters with heli-buckets, three additional pumps and the Command Unit, several specific command roles, Police and St John. The plan includes identifying the nearest appliances, including tankers, helicopter operators, and Command Units. The plan stated clearly that any structure or vegetation fire in the Lake Ōhau Alpine village zone would get a high level of response regardless of the fire danger rating levels. The OIC of the first arriving appliance immediately on arrival transmitted a third alarm to get more resources to the fire.

The plan includes several risk mitigation strategies including advising residents to have their own fire plan, text-based alerting in place, fire danger warning signs and a remote weather monitoring station to cover Ōhau, advising of 'spike' days, and regular annual education.

The review team found that the tactical fire plan for Lake Ōhau Alpine village was not available on the fire appliances that would normally respond to a fire in the village, although the officer of the first responding appliance (OMAR567) was aware such a plan existed. He had requested the attendance of the local DPRFO as he thought he would carry a copy of the plan.

Fire boxes had been installed in the village containing some basic firefighting equipment, so residents had the ability to extinguish any small vegetation fires. Each year training would be provided by a team from Fire and Emergency NZ. A time and date had been agreed with the community for the 2020 year for the training to take place but unfortunately the fire occurred first. As it transpired, the residents spoken to recognised that the fire was too big and intense to be able to safely deploy the equipment in the fire boxes anyway.

The Waitaki District Council had installed a siren in the village like the ones on volunteer fire stations. The intention was to enable residents to alert the village when a serious incident occurred, with all residents aware of how to set the alarm off. A resident did set this alarm off as soon as they recognised the threat from the fire, and this was a major contribution to the early evacuation of the village. But evidence gathered showed that people staying as either short term holiday makers or owners who use their property as a holiday home were not fully aware of the village plan. This meant some may have thought the siren was alerting the local volunteer brigade to the fire, but the nearest brigade is in Omarama.

As Lake Ōhau sits beside a large lake, water supplies for firefighting purposes were not an issue for planning purposes. There is also another much smaller water source (Lake Middleton) a little south west of the village where the Lake Ōhau motor camp is located.

In terms of being prepared, Otago had experienced a very busy fire season, so crews were operationally ready. Only five weeks earlier many brigades and teams had worked for several days on a large wildfire at nearby Pukaki Downs in the Te Ihu fire region, with many of the crews that responded to Lake Ōhau, or Livingstone on the same night, involved in this fire. The district was well prepared in terms of skills, knowledge and experience for this fire, a perfect training ground. The OIC of Omarama said he was able to draw on this experience when confronted with the situation at Lake Ōhau.

Response

Communications Centre

Initial Mobilisation and Assistance Requests

Our findings

SouthCom processed the call and responded appliances in a timely manner as and when requested. All notifications were actioned appropriately. There was a challenge for SouthCom with this incident as the Livingstone fire started shortly after Lake Ōhau fire and District resources were very stretched. This meant some appliances that would normally respond to Lake Ōhau on a second alarm had already been responded to the Livingstone fire.

Due to the two fires occurring simultaneously, SouthCom had to undertake some additional support functions for the Livingstone IMT as a lot of the Otago DPRFO resource was responding to Lake Ōhau. This work mainly involved ordering excavators, helicopters, etc and placed a lot of additional work on the SouthCom staff. Without detailed and current fire plans this can be a difficult task. Due to the separate LMR radio channels between Waitaki and Mackenzie, SouthCom was also receiving messages and requests via cell phones.

SouthCom contacted one of their team members who was in Otematata at the time. This person willingly made themselves available to support the Command Unit. This improved liaison with SouthCom and

feedback to the review team indicated this extra support in the command unit was very much appreciated by the IMT.

Safety, Health, and Wellbeing

Our findings

The first arriving crews faced an intensely challenging situation with fire already in the village, many occupants already evacuating, and very limited resources. The OIC informed his crew as they entered the village that they would be prioritising evacuations and not firefighting. He had informed them earlier to refresh the key safety points covered on their LACES cards so was ensuring the crew had a safety-first mindset. He was faced with one of his most critical decisions immediately: whether to not enter the village to ensure the safety of his crew or to take a calculated risk to save life. He had considered very carefully the risks and decided that the biggest threat was a life risk for residents. He elected to continue into the village and had IGC radio contact with the OIC of the Twizel tanker that was behind them. The actions of these first arriving crews, the local Police Officer, and many residents ensured no lives were lost.

There is no doubt the fire crews and the local Police officer took a risk in entering the village. But it is the opinion of the review team that it was a calculated risk that ultimately ensured no lives were lost. We were informed there were actions that several residents took at some personal risk, to ensure no one in the village was left behind. One resident was driving around the village tooting their horn to wake occupants, while others left on hearing the siren or observing the approaching fire themselves. But some stayed to ensure the full evacuation of the village until advised to leave for their own safety.

The crews completed a fast sweep and assessment of properties and with reasonable confidence that people had evacuated, the OIC re-assessed his options. He could see the fire was getting worse and wanted to relocate the crews and the local Police officer to a defensible location. They moved their appliances further through the village and located a defensible place to re-assess their options.

The OIC's of both OMAR567 and TWIZ9011 monitored the safety of themselves and residents assisting throughout the intense stage of evacuations and checking properties. The OIC of the crews that located to defend the estate just south of Lake Middleton immediately appointed a competent safety officer.

As the incident progressed and an IMT was fully established, safety briefings were held regularly, especially during formal meetings. Although safety officers were appointed to each sector it was commented on during the formal debrief that for an incident of this scale and complexity more safety officers would be beneficial for each sector as there is a lot to contend with.

There was also concern expressed related to cordons that were not managed as well as was required, as well as a couple of access points that were missed. The bike trail from Omarama allowed hikers and bike riders within the location of the fire. There was also a back road which some residents used to

check on their houses. Another concern was personnel from some supporting agencies not having PPE (helmets) while there was a lot of debris flying around due to the high winds.

There were no recorded incidents relating to driving to and from the incident. As an extra safety precaution, the OMAR567 OIC also notified SouthCom to advise responding appliances that there was a lot of traffic on the road from evacuating residents.

Once the formal IMT was established, planning commenced immediately to begin to provide welfare support, rest breaks, relief crews, catering and accommodation for firefighters from out of the local communities. There was a lot of comment around firefighters on the incident ground not always being provided with food and water in a reasonable timeframe, especially for the first couple of night shifts. But those resting in the town and getting breakfast and dinner there felt the locals looked after them well. There was comment that accommodation for some teams was not considered suitable for good rest but options at the time were limited. Being accommodated in bunkrooms did not give the quiet environment needed by people who had been working long and hard.

The debrief identified that besides the issues with the distribution of water and food to some crews, ablution facilities were not available in the early stages to all firefighters on the incident ground. This seemed to be worst in those sectors more distant from the village. This will need to be prioritised in future by the IMT as early as possible during longer duration incidents as sometimes the required resources will not be near to hand.

There were nine incidents recorded in the safe@work system. Five of these entries were near miss reports, two were hazard exposure incidents. Both related to carcinogen exposure related to smoke exposure, and two were injury/illness. One of these was a minor injury and the other required transportation to Timaru Hospital to [REDACTED]. This person was discharged home and is now fine. All the entries will be the subject of an accident investigation.

Incident Ground Management

Command and Control procedures

Our findings

Initial actions and size up

Due to the extremely high winds and the elevated dryness of fine fuels, the fire quickly developed and made its way in the direction of the Lake Ōhau village. Ember attack was predominant throughout the fire run as the fire crowned through standing pine and other exotic trees resulting in significant ember storms during the initial phases of the fire.

The OIC of OMAR567 had no time to conduct a comprehensive size up in the traditional sense. He had observed many vehicles leaving the village as he approached it so determined the situation was quite bad. And that is exactly what he saw when arrived, a large wildfire driven by high winds fast approaching

the village. The seriousness and escalating nature of this event was immediately recognised and as such alarm levels were increased, additional resources were responded accordingly, and further resources ordered for the onset of day light.

En route he observed large flames like the Pukaki Downs fire only five 5 weeks earlier and transmitted a second alarm. He transmitted a third alarm as soon as he arrived and wanted SouthCom to be aware this was as much a structure fire as a wildfire so they would need more urban trained crews to respond. His priority was life risk so he focused on increasing alarm levels, evacuation, and then structure protection.

He advised his crew they would be doing evacuations, not firefighting and directed his appliance to the top of the village. The initial focus was the most at-risk homes first. He had heard the Omarama based Police Officer on the shared LMR channel so contacted the officer's mobile phone to liaise with him

He was aware he needed to establish a base for further responding appliances and spoke with the OIC of TWIZ9011. Working together and in liaison with the Police Officer, he took charge of operations but did not have enough resource to put a more formal structure in place. When the chief fire officer from Twizel arrived, he contacted the IC (OIC, OMAR567) who gave him a handover and the CFO took command. He asked a firefighter to act as his scribe and note down all his decisions and the names of all personnel at the incident.

On arrival, the AAC from Timaru received a handover from the IC and appointed him into a new role as the Operations Manager, and the DPRFO who had just arrived as the safety officer. Their strategy and tactics at this stage were focussed on protecting as much of the village as they could, with an expectation that once helicopters arrived at first light a focus could go on the wildfire along with more resource for ground crews to support air operations.

Senior officer notification and response

The Lake Ōhau tactical fire plan stipulates that on the transmission of a second alarm SouthCom will alert the duty DPRFO to respond along with an air attack supervisor, safety officer and support staff. On top of this requirement, over the next hour SouthCom notified several other executive officers. The on-call executive officer from Timaru responded immediately when the Timaru based Command Unit responded and on arrival assumed command.

Within an hour of the first appliance arriving at Lake Ōhau many key notifications had been made. These included Network Waitaki for power, Civil Defence to establish evacuation centres, Police and Ambulance, Department of Conservation, FENZ national media team, and FENZ National Commanders Group.

Effectiveness of early management structure and extended response

An initial incident management structure was established by the first arriving officer, but he had extremely limited resource at his disposal so had to shoulder most of the roles himself. Once the CFO

Twizel arrived, they had enough personnel to establish a basic structure with an operations manager, safety officer and two sector officers appointed. When the Timaru AAC arrived, he was able to further enhance the structure that continued to be built as further resources arrived. This included liaison and recovery roles to ensure early engagement with the affected community.

Considering the challenges being faced and resource on hand, the structure initially implemented by the OMAR567 OIC was all that was feasible. He had considered safety of crews and had made an immediate request for more resources through transmission of a third alarm. But in making his initial decisions he recognized many of these resources would not arrive for well over an hour so he would remain in charge until the CFO Twizel arrived.

The CFO Twizel could see the flames from the fire when he was woken from his pager notification and could see a large fire in the direction of Lake Ōhau. He decided to respond immediately in the station utility. When he arrived close to the village he had to stop as flames and embers were crossing the road. Once he was able to get through, he contacted the OMAR567 OIC who had set up a forward control point (FCP) about a kilometre past the village. He received a handover and took command, appointing the OMAR OIC as operations manager. He asked the OIC of TWIZ9011 to take the Omarama tanker back to Shelton Downs (the Estate) and once there was appointed as the safety officer to support the OIC of this sector.

When the AAC from Timaru arrived, he took command and was able to instigate a very basic structure with himself as IC, the DPRFO as Safety Officer, the CFO Twizel as the Operations Manager, and two sector commanders, one in the village and one at Shelton Downs. An Area Commander (AC) arrived from Queenstown and after discussion with the incumbent IC, elected to take on the liaison role and leave the AAC as IC. When the Otago based PRFO arrived he went for a fly over in a helicopter to get situational awareness, left the IC in place and went into Twizel with the Liaison Officer to meet with the residents. He was aware that a NIMT was arriving soon and the leader of this team was only travelling from Timaru so would be there soon. It was his intention to appoint this person as the IC and retain the Recovery Manager role. He saw this as the most important role for him and understood the role would need to carry on well past the final extinguishment of the fire.

Each stage of command from first arriving officer to the implementation of the full IMT and appointment of the IC followed the expectations expressed in the interim 'Command and Control' policy. The early arrival of the NIMT ensured the structure required for a fire of this magnitude in support of the District was implemented as quickly as possible. Once the NIMT arrived a comprehensive IMT was established at the Twizel fire station and was ready for their first formal briefing at 7:00am the following morning. The fact that the IC was able to establish an initial IAP on the first evening of the fire meant that the initial strategies and tactics implemented by the first arriving crews were able to be continued and built on during the evening and into day two.

The strong working relationship between the PRFO's from Otago and South Canterbury as well as the wider teams for both Districts also assisted the management structure with several positive comments captured. This subsequently ensured the planning required to maintain the response was prepared and implemented quickly with minimal disruption as teams were rested and replaced.

Strategy and tactics

The initial strategy was focussed on the life risk to ensure the complete evacuation of the residents in the village. Once the OIC was reasonably certain all residents, including holiday stays, were evacuated he gathered all personnel in a defensible location about 1km north of the village.

When the CFO, Twizel arrived he was given a handover and reassessed the strategy and tactics. He decided when it could be done safely, they would have to enter the village to attempt to save as many properties as they could. Once he saw the opportunity, he decided to enter the village with the Twizel rural team as support and had regular contact with them as they drove around the village.

Once daylight came and the helicopter pilots had assessed the conditions and agreed it was safe to fly a decision was made to begin work on the suppression of the wildfire using heli-buckets only. Once it was considered safe to do so, ground crews were deployed to support the aerial attack.

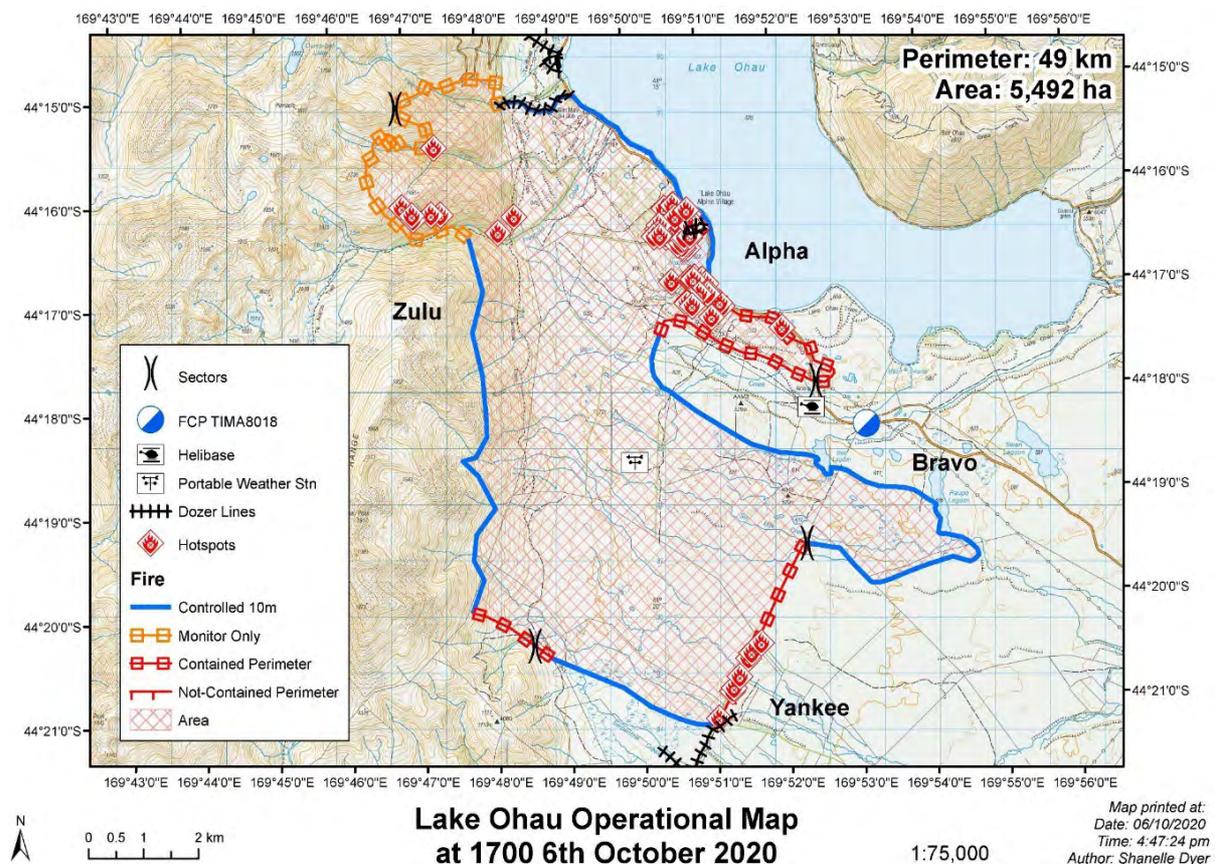


Figure 3. A map showing the Incident perimeter, containment lines and sectors.

Resource allocation

The Lake Ōhau Alpine village tactical plan had anticipated a serious incident being a real possibility if conditions were right. Therefore, the plan had ensured a good selection of resources were allocated immediately any incident occurred and responded immediately if a second alarm or higher was transmitted. This resource included three helicopters with heli-buckets, several appliances and tankers, and command personnel.

The first three days of the fire were the most intense. On the first day of the fire beside the fire crews deployed 13 helicopters and a mix of nine machines (diggers, Grader, Bulldozer, and tractors) were utilized. On day two, 16 helicopters, three fixed wing aircraft, and 5 machines were deployed. On day three, 12 helicopters, two fixed wing aircraft, and three machines were deployed on the fireground.

The Mackenzie District Civil Defence and Emergency Management team was utilised to provide initial welfare support and community coordination, which then passed to the Waitaki District CDEM team.

Department of Conservation (DOC) teams were heavily involved in firefighting operations and worked with FENZ personnel who had established facilities at Twizel fire station for the IMT. Conveniently, the DOC base in Twizel was close to the fire station.

Risk Management

As the Lake Ōhau tactical plan attests, risk management had been applied to certain locations within the Otago District. The placing of the village siren and fire boxes, and annual training with the community were risk mitigation strategies. This advanced planning played a significant part in the safe evacuation of all residents in the village at the time of the fire. Without this work the outcome could have been much worse than the loss of property and possessions.

The District has recognized that there is a need to review the plan to consider absent residents using their properties sparingly or as short-term holiday accommodation on popular holiday rental sites. The current plan does not account for these situations. Nor was the plan carried on first responding appliances, accepting that in the situation encountered for this fire it would not have provided any real assistance to these crews.

Water Supplies

It was always recognized that with the proximity of both Lake Ōhau and Lake Middleton there would be adequate water supplies for any large fire. With the support of Coast Guard to ensure a safe area for the helicopters to dip their buckets, this was done safely and effectively.

Coordinated Incident Management System (CIMS)

Relationships already established in the Otago district meant it was relatively easy to set up the Coordinated Incident Management System (CIMS). The structure allowed for the FENZ National Incident Management Team to manage fire operations with roles in the wider CIMS structure to look after the fire with the full support of all agencies. This relationship ensured the first PIM role was readily available, filled by a person from the Otago CDEM team.

Inter-agency and/or stakeholder relationships

These relationships are well established as mentioned above. The lead reviewer has observed Simulation Exercises in both Otago and Mid-South Canterbury, as well as operational review debriefs in Otago where a range of stakeholders are always invited. The debrief for Lake Ōhau repeated this pattern with all stakeholders who had an interest in this incident invited to attend and have their input. In the early stages liaison was established with the community and residents, Iwi, land and forest

owners, Department of Conservation, and the Waitaki and Mackenzie District Councils, as well as the Waitaki Power Authority. Key agencies were included in the IMT with others invited to attend community briefings.

The IC had recently led the FENZ response to the Pukaki Downs fire and the lessons from that incident were fresh in his mind as he took on the role of Incident Controller. Many in the IMT had worked together at Pukaki Downs so they all put in extra effort to ensure they worked closely and effectively with all identified stakeholders. They made it an immediate priority to connect and protect the affected community and ensure they were well informed in a timely manner.

Landowners with machinery on hand had endeavored at an early stage to create their own fire breaks but worked well with the FENZ personnel once the full IMT was established and contractors were brought in.

The review team interviewed several external stakeholders for this review and received positive feedback from those spoken to. The Waitaki District Council were very helpful in setting up community liaison and working with the IMT from day two of the incident.

Incident Management Team

Our findings

A National Incident Management Team (NIMT) was requested and established by around 10:00pm on the day the fire started. The Otago PRFO, realising the seriousness and magnitude of the situation, requested a NIMT be activated before responding to Lake Ōhau. This was a sensible early decision as the Region had experienced a recent flooding event in Invercargill and was also responding to a wildfire threatening property at Livingstone. Livingstone is only 130km south east of Lake Ōhau so the resources within the Region were very stretched.

When the request was transmitted, the on-call person for the National Rural Support Team was going to activate the duty team based in Hawkes Bay. This would have taken some time to assemble and be ready to support the emergency. As the PRFO was aware there was already a NIMT based out of Timaru he requested they be activated rather than waiting for the on duty NIMT based out of Hawkes Bay. This resulted in the very early establishment of the IMT as most members of this team are located in the South Island.

The Incident Controller arrived at the Command Unit at Lake Ōhau in the late afternoon. He was able to do some early planning with the Otago PRFO and the person appointed as the interim Planning Manager. This work resulted in an IAP being developed for the next day, with the full IMT ready to commence work at 7:00am the following morning.

Planning and Intelligence

The initial planning role was assumed by a member of the Te Kei Region who drove from Dunedin and had recently completed the Planning Managers Course. Working with the PRFO and the newly appointed IC, they were able to develop an IAP for the commencement of the following day shift. When

the NIMT arrived another person from that team was appointed as the Planning Manager and the two people worked together to get the planning function working effectively.

The IC stated he was well supported by the Planning and Intelligence function throughout the incident. Incident action plans (IAP's) were produced for day and night shifts. Comments were made from field personnel that the morning briefings were very informative, and they also appreciated a copy of the IAP.

The debrief highlighted the importance of the representative of the Air Division attending the morning briefings so everyone was on the same page throughout the incident.

Public Information Management

Around 4:45am SouthCom paged the National Communications Team to advise media support had been requested for two fires in Central Otago and one in Canterbury. The on-duty media advisor started receiving media requests, the first from RNZ around 5:30am and alerted her manager. Arrangements were made to get her on the ground in Twizel as soon as a flight could be arranged.

The on-ground Public Information Management (PIM) function was managed by a person from the Otago CDEM team in the initial stages. She put out a couple of media releases and then worked with the FENZ media support. They wanted to ensure consistent messaging so spoke with the Te Kei RCC to see what support they could offer. They also ensured the National Commander and ELT were kept informed. Subsequently FENZ NHQ sent two members of the National Communications team to Lake Ōhau to support the IMT. Throughout the incident the IC advised he felt very well supported by this team. They provided briefings for the IC and supported the Liaison officer when engaging with the Mayor and residents.

The Communications team felt in future it would be advantageous to get to an incident sooner. With two RCC's operating (Te Kei and Te Ihu) it was a challenge keeping consistent messaging to the public and there was confusion around which social media pages were being used. The review team was also told that not having access to Region Facebook pages to help ensure all messaging going out was consistent was challenging.

The IC and Recovery Manager both felt the support provided to them through the PIM team was very helpful throughout the incident and eased some of the pressure an event of this scale involves.

Logistics

As this incident involved resources from both Te Kei and Te Ihu, both of their RCC's were activated. This created some issues for consistent communication between the IMT and the RCC's. An example we were advised of was when a request for relief crews from Dunedin was passed via the Command Unit to the Te Ihu RCC and was not received by the Te Kei RCC until it was noted the resources had not arrived. The Te Ihu RCC stood down on day three which resolved this issue but the IMT felt that having two RCC's operating in support of one incident was messy for them.

Logistics personnel were in the IMT at the Twizel fire station. The assistance of people in the community can be very helpful in incidents of this scale. Having the IMT at the Twizel fire station ensured the IMT had access to the community through brigade members. Locals know where resources are and if not available, where the nearest place is to access them. Respect communities have for their brigade ensures good cooperation when help is requested.

The logistics role is crucial support for the incident and needs to be well resourced as early as possible. This unit is trying to deal with requests for equipment and personnel resources while trying to ensure there are facilities, services and materials to support the incident. Naturally this can only happen when there are enough personnel in the logistics team.

Welfare

Welfare took a while to get fully functioning so initial arriving crews did long shifts throughout the first day of the fire. They were working hard, and it was through the initiative of the local brigades that catering was provided in the early stages of the fire.

But once the IMT was established the welfare function took over from the local brigades. This function was complicated for this event as the welfare of the community was also a priority, and there was a significant amount of FENZ resource at the incident. This meant there was a lot of accommodation required and we heard that some of this accommodation was not suitable for people trying to rest, especially during the day shifts. Rooms were provided in a facility with noisy maintenance occurring, which disturbed firefighters' rest before their next shift.

But overall feedback was very positive, and all personnel involved appreciated the complexity of the incident and local facilities being in small communities. They were also empathetic to the residents of Lake Ōhau Alpine village whose homes were destroyed or were so damaged they couldn't return to them.

Liaison

A liaison officer was appointed very early in the incident as it was recognized that with the destruction caused by this fire there would be a lot of concern locally and within the wider community. The first formal community meeting was held the very first afternoon in Twizel attended by the Recovery Manager and the Liaison officer. At this meeting they took time to try to understand the community concerns and committed to holding regular community briefings.

Working with the PIM team they were able to arrange buses to take the residents through the village to see their homes before others were allowed in. This was very important for the residents who did not want to see photos of their homes through any form of media before they had had a chance to see the destruction for themselves. Three buses were provided with a senior FENZ officer, victim support and welfare representatives from the Waitaki District Council on each bus, both for safety purposes and to answer questions from the residents and provide support. This was very emotional for the residents.

Finance

The total cost to FENZ of fighting this fire was \$1.365m. A finance function was established as part of the IMT and monitored all costs incurred by FENZ. During the debrief it was identified that some work is still required to make it easier for everyone to understand responsibilities and record costs for services such as USAR, Coast Guard, and contractors who were used at this incident. There is also a need to ensure all FENZ personnel responding to support the incident understand the need to keep a record of incidental costs such as kilometres travelled etc.

When the total fire costs were consolidated, it was identified that many costs were incurred through FENZ personnel going directly to suppliers and using their purchase cards rather than putting requests through logistics. This was often done for personal items that should be included in a person's response kit. Though they are small purchases they mount up and can be sourced if needed through logistics who are able to keep an accurate log of what has been purchased to support the incident. These costs would not be recoverable if FENZ was supporting another agency.

Communications

Once the IMT was fully established, communications between the IMT and Operations was considered effective. We were told that briefings were well run and leaders attending were pleased to receive a copy of the IAP for the relevant operational period at the briefing.

It was raised during the debrief that all key lead roles involved in the fire need to attend the main briefing to raise any issues with the IC but more importantly to understand the strategy and tactics for the next operational period. Overall all personnel thought the communications was effective with positive comments received from the aircraft contractors.

USAR

Based on the information he was getting, the PRFO had requested an Urban Search and Rescue Team (USAR) utilizing drones be responded to Lake Ōhau. His initial thinking was to utilize drone capability to scan all properties to get certainty all residents of the village had safely evacuated. Fortunately, the evacuation had been safely completed in the early hours of the morning once the alarm was raised.

Acting on the request, a USAR team comprising drone pilots to do mapping and thermal imaging, and Rapid Disaster Assessment (RDA) personnel was deployed from the Southern USAR base in Rolleston, arriving at Twizel by 5:00pm.

When the USAR team arrived in Twizel, they found it was very busy as the IMT was being established. The RDA team wanted to complete their task while it was still daylight so located directly to the incident at Lake Ōhau. This team was able to work quickly and move from house to house to conduct an initial assessment of property damage in the village, looking to provide this information to the IMT for day two operations. In an operation like this the drones can only fly once the aerial firefighting operation has finished, so commenced their work as it began to get dark.

The work USAR did was very effective and the information that was able to be provided to the Waitaki District Council Recovery manager made her work much easier. But several issues were identified from

both the IMT and the USAR perspective. They did not impact the overall effectiveness of the response to Lake Ōhau but are internal issues that need to be resolved.

They include what Unit in the IMT the USAR Operations Manager reports to and ensuring all FENZ IC's and Planning Managers have a good understanding of USAR capability and what intelligence it can deliver for them. There is a need to ensure the Drone and RDA team leaders report through the USAR Operations Manager as this person is the conduit to the IMT and will attend all briefings once the IAP is established.

There are also concerns around data interpretation. The USAR team provide data to the IMT in the form of KML files but have found that at some events the person accepting the data cannot read KML files. Also, a lack of understanding of what data and in what form USAR can provide meant that personnel in the planning unit were overlaying maps and sometimes getting incorrect information.

Region Coordination Centre support to IMT

Our findings

As both Te Kei and Te Ihu RCC's activated it created a layer of confusion for the IMT. The first Command Unit responded was from Timaru in the Te Ihu Region. When requests were passed through them for the RCC they naturally defaulted to the Te Ihu RCC. With communication between the two RCC's not well established at first this meant requests were being missed – Te Ihu RCC presuming that Te Kei RCC would deal with the issue when in fact the issue became lost. Protocols need to be established for how the communication channels will work when more than one RCC is activated in support of a response.

The issue resolved itself once the Te Ihu RCC stood down at the end of day three. At the same time the support provided through the RCC's was invaluable and allowed the IMT to focus on the fire and the community impacted.

Recovery

Our findings

Recovery is one of the cornerstones of the 4 R's referred to in emergency management circles. The 4 R's refer to Reduction, Readiness, Response, and Recovery.

The PRFO for the Otago fire district was alerted to the incident around 7:00am and contacted the Te Kei RCC. He recognised very quickly the serious impact this fire would have on the Lake Ōhau Alpine Village community as he was well aware of the special risk plan developed for this community. He contacted the RCC and asked them to activate the USAR drone capability. Then while responding to the fire he contacted SouthCom to activate a National IMT. The duty team was based in Tauranga, so he requested that they activate the Timaru-based team. The PRFO was aware they would be available as he and the Mid-South Canterbury PRFO (who led this team)

were in regular contact due to the extreme fire conditions being experienced at this time. They had also worked together during the recent Pukaki Downs fire.

The Otago PRFO realised immediately that he would need to hand the IC role over to the IMT lead so he could focus on recovery and support the community. While responding he contacted the IC for the Livingstone fire that had started only minutes after Lake Ōhau. Reassured that they could cope with the limited resources they had at hand, he continued toward Lake Ōhau. When he arrived, he went directly to the Command Unit positioned near the entrance to Lake Ōhau Alpine village. From there he was able to commence gaining situational awareness of what they were facing. With the support of the interim Planning Manager and the Mid-South Canterbury PRFO who had also arrived they worked to develop a structure and prepare an IAP for the following morning, while at the same time ensuring there would be continuity on fire operations over night.

A Recovery team was formed by the Otago PRFO who lead the recovery as part of the IMT with good support from both Waitaki and Mackenzie District Councils, and a range of FENZ personnel with skills and experience to contribute to this important work. The main priority for this team was to support the Lake Ōhau community and provide as much support and advice as FENZ legislation allows. Though running on instinct and some lessons learned from recent incidents, the importance recovery was going to play in this incident was front and centre of the IMT's strategies. The information provided to the review team to prepare this report indicates they did a great job.

Conclusion

This fire caused more property destruction than any other New Zealand wildfire in recent living memory in a single community. Forty-eight dwellings and structures were destroyed, and another six suffered significant damage. The Insurance Council estimated losses to the value of close to \$35 million. Infrastructure in and around the village was also heavily impacted, mainly power supplies, water supplies, and communication networks. There was significant fencing damage and some stock losses, most on one farm. In total the fire consumed approximately 5043 hectares with a perimeter of 49km. Of the total fire area burnt, 1,550 hectares was conservation land within the DOC estate.

Weather conditions presented some extreme fire conditions and the possible outcome had been previously anticipated through Otago fire district risk planning. Through this process a tactical fire plan had been developed for the village as it was recognized that property would be at risk if a wildfire occurred under extreme weather conditions.

First arriving response crews faced fire conditions rarely seen in New Zealand. The OIC of the first appliance assessed the risks they faced and considered what they could safely achieve. He advised his crew they would be focused on evacuations, not firefighting, putting the safety of the residents first. Because of the special risk plan developed for Lake Ōhau and the emergency siren installed by the Waitaki District Council, several residents did an amazing job of making the community aware of the imminent danger and urgent need to evacuate. They were supported by the first arriving Omarama and Twizel crews, and the Omarama based Police Officer once they arrived. This combined effort ensured no loss of life from this fire.

The Otago District had been having a busy fire season and on the night this fire occurred conditions were extreme due to the very high winds. Only a few minutes after this fire started another ignited in Livingstone so the District resources were stretched. With support from the Mid-South Canterbury Fire District they were able to get a quick response and had a strong IMT in place by 10:00pm that evening ready to be fully operational the next morning. This included the first IAP being ready for the operational period commencing on the second morning. But the major damage had been done to the village within the first few hours of the fire and the strategy for the first day and following night was focused on protection of remaining properties, extinguishing property fires still burning, and commencing the suppression activity on the wildfire through an aerial heli-bucket attack.

Despite the usual challenges in commencing any campaign fire with limited resource, through the support of local employers' volunteers at Omarama and Twizel were able to stay engaged in the fire suppression activity for several days. The IMT was in place by 10:00pm on the first day of the fire and was able to commence operating from 7:00am the following morning when they received their first briefing. Key focus and strategy revolved around the community and ensuring all stakeholders were engaged with the IMT. The IMT was located at the Twizel fire station, which was able to provide good facilities and support.

The IMT was well resourced as soon as was practical and received good support from Te Kei and Te Ihu RCC's despite challenges in duplication of effort at some stages. The IC commented on how helpful it was to have good communications support from Otago CDEM in the first instance, then NHQ to manage both the media and political interest of this fire. With a priority on the residents most impacted, a plan was developed to allow them to be escorted into the village to see the damage first-hand before media were allowed in. This action received very positive feedback from many in the community and was part of the recovery planning.

Recovery had commenced from day one and in liaison with the Waitaki District Council ensured the wider community and landowners remained a priority throughout the campaign.

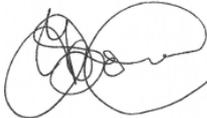
Several suggestions and recommendations came from the debrief held at Omarama fire station. These were internal issues that FENZ as a learning organization will consider to ensure continuous improvement. Many of them are already being worked on in the Te Kei Region, and none of them had a material impact on containing and controlling the fire.

It is the view of the review team that this was a well-managed and coordinated incident that had good strategies to ensure those most impacted by the fire remained as the priority. A recovery plan was provided to the Waitaki District Council's Recovery Manager that ensured continuity of the recovery planning done during the incident. The PRFO for the Otago District continues to keep in liaison with the community.

Review Authorisation

This report has been prepared and authorised by Operational Efficiency and Readiness:

Everything in this statement is true to the best of my knowledge and belief, and I made the statement knowing that it might be admitted as evidence for the purposes of the standard committal or at a committal hearing and that I could be prosecuted for perjury if the statement is misleading.

<p>Trevor Brown Assistant National Commander National Operational Efficiency Manager</p> 	<p>Mike Grant Region Manager Te Kei Review Sponsor</p> 
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Approved for Publishing



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Annex A – Detailed weather data



Fig. 23. Mid-South Canterbury Portable RAWS wind graphs above.

Wind

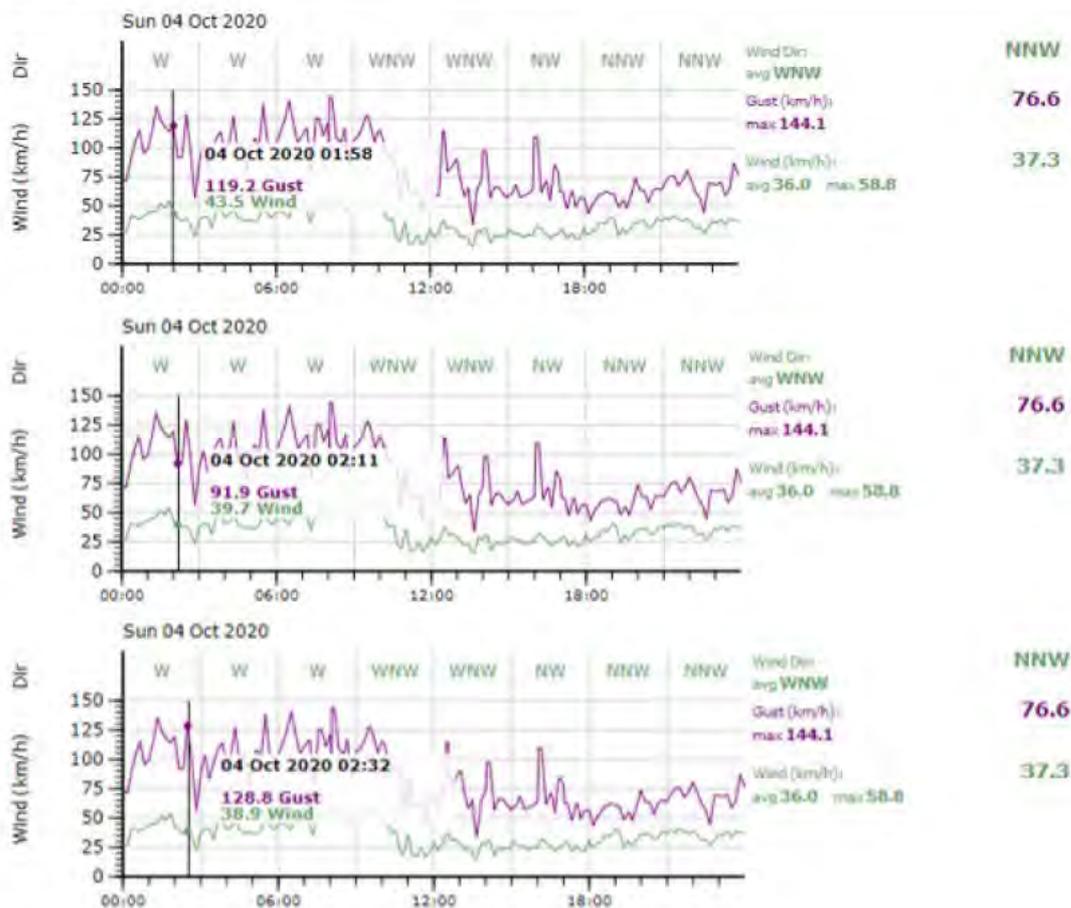


Fig. 24. Glentanner RAWS wind graph above.

Date	Time hrs	Station	Wind Gust kph	Av Wind kph
4/10/2020	01:15	Glentanner	135.8	45.5
	01:19	Portable	91.6	44.5
	01:05	Pukaki Aero	85.4	41.3
Approximate	02:11	Glentanner	91.9	39.7
Time of	02:11	Portable	111.3	47.1
Ignition	02:10	Pukaki Aero	49.3	29.5
	02:32	Glentanner	128.8	38.9
	02:31	Portable	100.4	45.5
	02:31	Pukaki Aero	59	34.9
	03:34	Glentanner	96.9	31.9
	03:34	Portable	127.3	41.9
	03:33	Pukaki Aero	57.1	29.9
5/10/2020	15:23	Glentanner	101.8	58
	15:23	Portable	114.4	47
	15:22	Pukaki Aero	46.9	33.6
6/10/2020	04:24	Glentanner	118.8	67
	04:25	Portable	163.5	70
	04:24	Pukaki Aero	48.6	26.3
	05:44	Glentanner	76.5	51.1
	05:44	Portable	167.2	91.9
	05:43	Pukaki Aero	50.3	22

Fig. 25. Above, combined wind speed data from Glentanner, Pukaki Downs and the Mid-South Canterbury RAWS. Grey shading identifies wind speeds at the approximate ignition time.

Daily Mode ▼ October ▼ 4 ▼ 2020 ▼ [View](#)

Summary
October 4, 2020

	High	Low	Average
Temperature	23.6 °C	16.4 °C	17.0 °C
Dew Point	12.7 °C	-18.7 °C	10.0 °C
Humidity	69 %	6 %	64 %

	High	Low	Average
Wind Speed	89.6 km/h	0.0 km/h	37.7 km/h
Wind Gust	<u>112.7 km/h</u>	--	49.2 km/h
Wind Direction	--	--	SE
Pressure	1,016.59 hPa	1,013.88 hPa	--

[Graph](#) [Table](#)

October 4, 2020

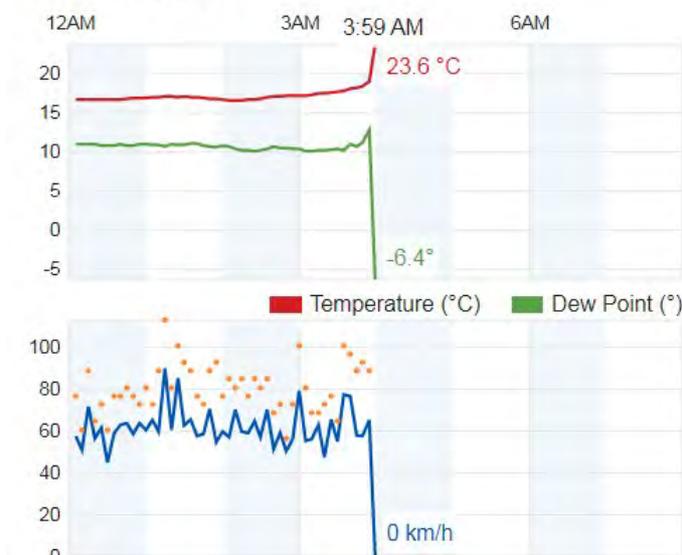
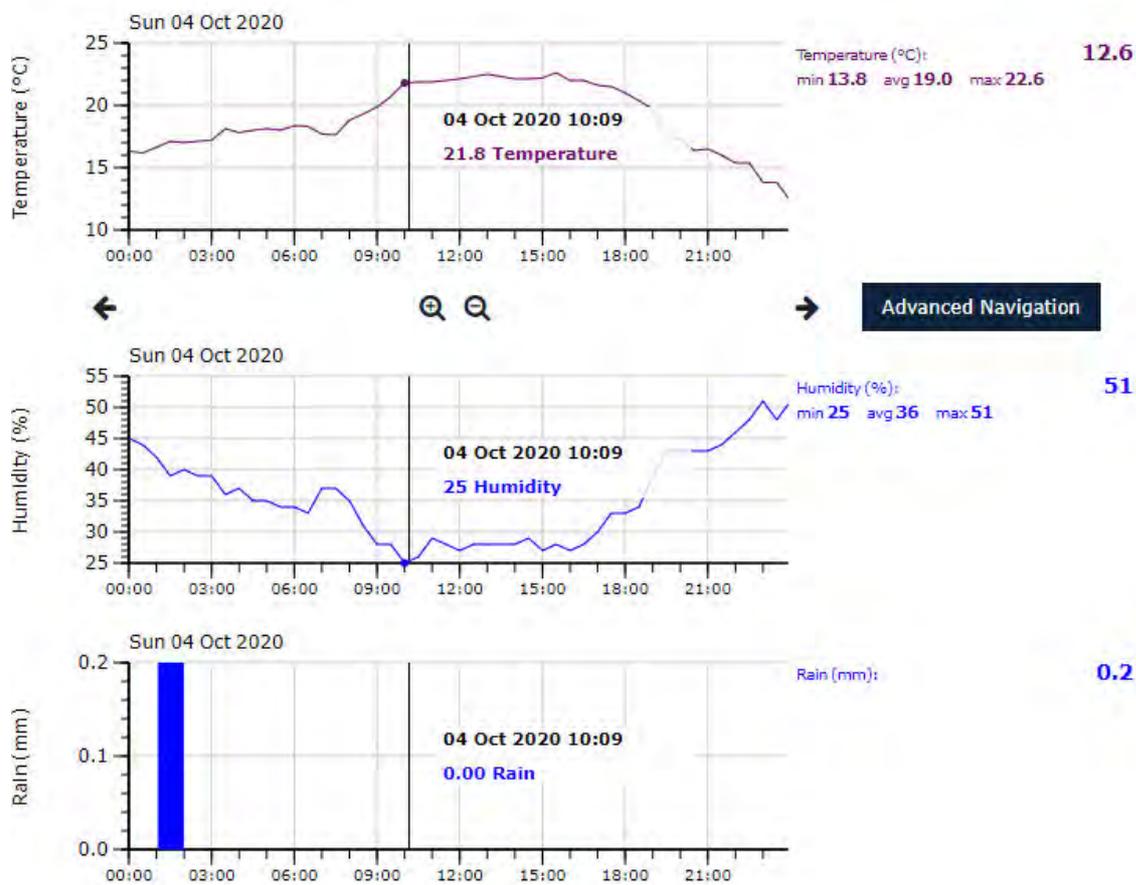


Fig. 26. IWAITAKI4 Weather Station data 4 October, stopped recording when overrun by fire. (Private Weather Station based in Lake Ohau)

Pukaki Downs portable Weather Station

Day of ignition and time of call received by FENZ (4th October, 0306hrs)



Pukaki Aero Remote Automated Weather Station

Observed 1pm daily weather readings, FWI values and calculated Fire Danger rating for period 28 September to 7 October 2020

Validity time (local)	FFDC	SFDC	GFDC	FFDC	SFDC	GFDC	Temp	RH %	WindDir	WindSpd	RN24	GC%
28/09/2020 13:00	1	1	1	LOW	LOW	LOW	6.2	73	233	23.8	0.0	80
29/09/2020 13:00	1	5	2	LOW	EXTREME	MODERATE	6.5	31	189	32.0	0.0	80
30/09/2020 13:00	1	4	2	LOW	VERY HIGH	MODERATE	10.8	41	230	9.0	0.0	80
1/10/2021 13:00	1	5	2	LOW	EXTREME	MODERATE	13.1	43	78	6.5	0.0	80
2/10/2021 13:00	2	5	3	MODERATE	EXTREME	HIGH	18.3	28	290	6.5	0.0	80
3/10/2021 13:00	2	5	5	MODERATE	EXTREME	EXTREME	19.4	38	279	36.4	0.0	80
4/10/2021 13:00	2	5	5	MODERATE	EXTREME	EXTREME	23.2	28	250	27.4	0.0	80
5/10/2021 13:00	2	5	4	MODERATE	EXTREME	VERY HIGH	24.8	23	285	14.4	0.0	80
6/10/2021 13:00	3	5	5	HIGH	EXTREME	EXTREME	17.0	52	339	32.0	0.0	80
7/10/2021 13:00	2	5	4	MODERATE	EXTREME	VERY HIGH	17.9	31	226	18.7	0.0	80

Validity time (local)	FFMC	ISI	BUI	DMC	DC	FWI	FFMC (Ignition Potential)	ISI (Rate of Spread)	BUI (Control - Available Fuel)	DC (Mop-up Needs)	FWI (Fire Intensity)
28/09/2020 13:00	39.2	0.1	5.0	2.9	45.6	0.0	Difficult	Slow	Easy	Little	Low
29/09/2020 13:00	70.2	3.2	6.2	3.7	46.3	2.4	Difficult	Slow	Easy	Little	Low
30/09/2020 13:00	80.0	2.0	7.4	4.6	47.5	1.1	Moderately Easy	Slow	Easy	Little	Low
1/10/2021 13:00	84.9	2.9	9.4	6.1	50.8	2.8	Moderately Easy	Slow	Easy	Little	Low
2/10/2021 13:00	89.5	5.5	12.4	8.6	54.9	6.7	Very Easy	Moderately Fast	Easy	Little	Moderate
3/10/2021 13:00	89.5	25.1	15.0	11.0	59.2	24.3	Very Easy	Extremely Fast	Easy	Little	Very High
4/10/2021 13:00	91.9	22.2	18.4	14.3	64.4	24.3	Very Easy	Extremely Fast	Not Difficult	Little	Very High
5/10/2021 13:00	93.1	13.7	21.8	17.9	69.6	18.6	Extremely Easy	Very Fast	Not Difficult	Little	High
6/10/2021 13:00	89.0	18.8	23.6	19.6	73.8	24.1	Very Easy	Extremely Fast	Not Difficult	Little	Very High
7/10/2021 13:00	90.1	11.2	25.7	22.0	77.7	17.4	Very Easy	Fast	Not Difficult	Little	High