Camp Hill Substation

Aurora Energy, the local electricity network, is planning a new, higher capacity substation at this site to cater for increased electricity demand in the area and ensure reliable electricity supplies to homes, farms and businesses. The Camp Hill substation is part of Aurora Energy's overall network development programme with $122 million of investment planned over the next decade in the Central Otago and the Queenstown Lakes region.

What is a substation?

A substation is a part of the electricity supply system that carries electricity from generation sources (such as wind farms and hydro power stations) across the national grid transmission system to the local distribution system then onto consumers. A distribution substation takes high voltage electricity and converts it to a lower voltage. Camp Hill substation is designed to take electricity at 33,000 volts (or 33kV) and convert it to 11,000 volts (11kV) for distribution via feeders to local transformers that convert it further to 230 volts for use in the home.

GENERATION & TRANSMISSION | DISTRIBUTION

	220kV	220kV / 66 kV	66kV / 33 kV	33kV	33kV / 11kV	11kV	11kV / 230V
Generation (Power Stations)	Extra high voltage transmission	Cromwell substation transformer	Wanaka zone substation	Sub transmission to Camp Hill	Camp Hill substation transformer	11 kV Feeders	Local transformers to consumers

More information

We welcome your feedback. For more information, please contact us on 0800 433 582 or visit our website www.auroraenergy.co.nz

Why is a new substation needed?

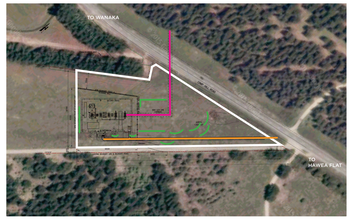
Electricity demand in the Hawea, Hawea Flat and Maungawera area has increased as irrigation use and the local population has grown. Historically, electricity demand in the area has peaked in winter with home heating. With increased irrigation use, the highest peak is now in summer. The existing Maungawera substation that supplies the area has reached its capacity for reliable supply. Any further demand growth will require a substation upgrade. A new substation at Camp Hill would increase the maximum capacity from 3 MVA (megavolt amperes) to 7.5 MVA to accommodate increased electricity demand and peak usage in summer and winter.

Why here?

Camp Hill is the preferred site because it is well-positioned in relation to where the electricity is being used and the wider electricity distribution network. The location allows us to build four high voltage (11kV or 11,000 volt) distribution feeders that will improve the reliability of local electricity supply (if there is an outage on one feeder, consumers on the other three feeders will be unaffected). The site is also on the potential path for a future 66,000 volt (66 kV) sub-transmission line ring that when built will provide an even higher level of electricity supply security in the Upper Clutha area. Importantly, the site is flood-free, flat and easily accessed from the road.

Site layout

The entire site is about 1.4 hectares. Built structures will occupy about 4,000 square metres or around a third of the site and include a power transformer, circuit breaker, electrical switchgear and power poles. There will be one building, the switch room, approximately 10 by 6.3 metres and 5.5 metres tall – about the size of a large double garage. The exterior will be finished in a natural colours (browns, greens or greys) with screen planting. The tallest structures will be five power poles installed inside the substation fence, similar in height to the ones already along Camp Hill Road (about 9 metres). The other electrical equipment on site is free-standing and will all be approximately 4 metres in height. For safety reasons, we are required to place high voltage electricity equipment at specified heights to meet the industry safety regulations.



11kV Cabling
66kV Line
Indicative Screening

Potential impacts

Visual

We have taken care in the site design to minimise the visual impact. The substation is set back from the road and there will be extensive screen planting around the perimeter fence. A detailed landscaping design has been developed to minimise visual impact, approved by Queenstown Lakes District Council.

Noise

Transformers and cooling fans in substations make a certain amount of low-level noise. An acoustic expert has assessed the noise level at the site boundary which will be below 25 decibels. That's quieter than a soft whisper.

Electromagnetic fields

All electricity produces electric and magnetic fields. Electricity transmission as well as many electrical appliances, produces electric and magnetic fields of extremely low frequency. From measurements at Aurora Energy's existing substations, the electric and magnetic fields outside the substation are calculated to be about 1% of the national recommended guidelines and similar to levels found in your home. The magnetic field outside the substation is estimated at 0.2 μT (microtesla) compared to the guideline of 200 μT, the electric field is estimated at 0.4 kV/m (kilovolts per metre) compared to the guideline of 5 kV/m.

Storm water and oil containment

Power transformers contain insulating and cooling oil essential to their operation. To remove the risk of contamination of storm water or run-off to the river, the transformer will sit within a concrete bund or embankment. Any rain water or oil caught within the bund is first drained into a catch tank then into an oily water separator. The oil contamination is removed and stored for off-site disposal and the clean water goes into a soak pit. The catch tank is large enough to contain the entire volume of transformer oil in the unlikely event of a major oil leak.

Construction

The substation is expected to take about nine months to complete. A traffic management plan will be in place if required. The construction phases include cabling and overhead line construction, civil works on site (earthworks to level and shape the site, laying concrete pads and foundations), then installation of the electrical equipment, landscaping and planting, testing and commissioning.

Indicative project timeline

MONTH	1	2	3	4	5	6	7	8	9
Consent application	Civil works start		Transformers delivered	Switchgear pads complete	Civil works complete	Transmission and switchgear commissioned	Electrical works complete	Site imporovements Final testing and commissioning	Substation in operation