



Review of Raglan Aerodrome

Report to Waikato District Council

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1 Executive Summary

Raglan aerodrome is a non-certificated aerodrome operated by the Waikato District Council located close to the Raglan township. The aerodrome has two grass runway vectors 05 and 23, with the published runway being 646 metres long and 60 metres wide at an elevation of 14 feet. The aerodrome is on a designated area of land that is close to the beach and also close to housing.

Currently the aerodrome is not fully fenced, nor is it delineated on the land area to identify the runway and associated aircraft parking area. The general public has unrestricted access to the area and are often crossing the runway to access the beach or carparks, and also using the aerodrome area to walk their dogs. Often conflicts have arisen between aircraft landing or taking off and members of the public using the area. This situation exposes the people on the runway and pilots using the aerodrome to risks that could lead to serious or fatal injury.

The Waikato District Council have responsibilities under the Civil Aviation Rules and the Health & Safety at Work Act to address the risks at the aerodrome. It has proposed changes to the way in which the aerodrome is managed to address health and safety risks associated with an operational aerodrome, for both pilots and members of the public. These risk controls have been queried by the community and Council are seeking an independent assessment of the health and safety risks associated with the Aerodrome, and a review of the controls that are in place to manage these risks.

This report outlines the current operational environment, the applicable regulatory requirements and occurrence data relevant to the current risks. Assessment is made of the risks to assess the safety of Raglan Aerodrome.

From this analysis it has been concluded the current aerodrome design is a critical factor to the risks and suggests a range of options to lower the risks and address some hazards currently in place. Information is also provided on temporary or permanent closure of the aerodrome.

A key outcome is to ensure the safety of person and property on the ground and in the air whilst allowing the aerodrome to still operate and contribute to the local community.

The suggested options provide a range of risk mitigations and controls as well as provide the aerodrome with improvements to operations. These are detailed in Section 10 of the Report.

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2 Background

Raglan Aerodrome is a small aerodrome located on the west coast of the North Island between Auckland and New Plymouth; it is west of Hamilton. The Aerodrome is situated on land administered by the Waikato District Council (WDC) in the Raglan township. The residential and commercial centres of Raglan are located to the south and east of the Aerodrome.

The Aerodrome is operated by the Waikato District Council's Open Spaces team from a maintenance and administration perspective. In accordance with Civil Aviation Rule (CAR) 139.19, the Raglan Aerodrome is classified as a non-certificated aerodrome.

The aerodrome is published in the Aeronautical Information Publication New Zealand (AIPNZ) and operates with the designator NZRA. The AIPNZ details as attached as Appendix A.

Recently WDC presented a report to the Raglan Community Board with some proposed changes to the way in which the Aerodrome was to be managed. These changes were recommended to better control the health and safety risks associated with an operational aerodrome, for both pilots and members of the public.

These risk controls have been queried by the community and therefore the WDC are seeking an independent assessment of the health and safety risks associated with the Aerodrome, and a review of appropriateness of the controls that are currently in place to manage these risks.

The Raglan Aerodrome Review scope is attached as Appendix B.

Mike Haines Aviation was engaged to undertake the review. Mike Haines is the lead consultant and Managing Director with over 25 years aviation experience covering regulatory, safety management systems and technical management. Mike has worked for Christchurch International Airport, the Civil Aviation Authority of New Zealand and Airways New Zealand in technical specialist and senior management positions.

Mike Haines Aviation currently provides support to the Pacific Aviation Safety Office as an aerodromes and ground aids technical specialist, to the World Bank as an aviation specialist advisor and is an International Civil Aviation Organisation qualified auditor and an aerodromes specialist on the technical cooperation international roster.

Mike was an aerodromes inspector for the Civil Aviation Authority of New Zealand and also managed the Aeronautical Services unit covering aerodromes, air traffic management, air navigation and airspace.

Whilst this report has been prepared the WDC has limited aircraft operations to operators with prior approval only as notified in NOTAM A2276/21.

3 Raglan Aerodrome

Raglan Aerodrome is published in the AIPNZ as a non-certificated Aerodrome meaning it is not required to be operated under an Aerodrome Operating Certificate issued by the Director of Civil Aviation under CAR Part 139.

The aerodrome is, however, subject to CAR 139.503 Unsafe conditions, which requires a non-certificated aerodrome operator to establish procedures to ensure that aircraft movements are restricted or prohibited on parts of the aerodrome where an unsafe condition exists.

The aerodrome is also an unattended aerodrome, meaning it does not have any form of air traffic service or similar. Pilots are required to make radio calls to inform other pilots of their location and intentions and comply with CAR Part 91 – General Operating and Flight Rules.

The runway is depicted on the AIPNZ chart as being 60 metres wide and 646 metres long. The runway vectors are designated as 05 and 23 with associated wind direction indicators on the runway vector threshold to the left hand side¹.

A number of notes are contained in the AIPNZ and upon assessment nothing unusual is detailed. The operational data for NZRA AD2 -52.1 provides the following runway operational information:

- The runway surface is Firm Grass Gr(f)
- The runway strength has an Equivalent Single Wheel Load of 1020 kg - used to advise pilots so they can calculate their aircraft ability to use the runway
- Group Rating 5 - Aircraft with a MCTOW of 2270 kg or below has a group rating number in the aircraft flight manual. The number for a particular aircraft is determined on the basis of its take-off and landing performance. In practice, a pilot may use any runway that has a group number equal to or greater than the aeroplane group rating for the particular aeroplane type.
- Slope of runway.
- Take off distance for a 1:20 which is a protection area for a runway used by aircraft only during the day and only in visual meteorological conditions i.e., the pilot flies visual without an instrument flight procedure. The aerodrome design take-off climb surface of 1:20 related to runway take-off effective operational length (EOL) provides a simple system for the aeroplane operator to calculate the aeroplane's maximum take-off weight to comply with the prescribed obstacle clearance requirements. If an obstacle does intrude into the take-off climb surface, the runway take-off EOL is reduced to the distance from which the 1:20 is achieved
- There are no lights or other facilities.

Supplementary data details the aerodrome operator information including contact details. In this case details are provided on the landing fees charging process.

Raglan is a typical small regional Aerodrome and due to its size and dimensions is restricted to smaller, general aviation aircraft. Movements tend to peak in the summer months with little mid-winter activity.

Aircraft activity includes helicopters, aeroplanes, microlights, gliders, model A/C (once), and nearby off-airport kite surfing. Medical emergency helicopter operations do not use the aerodrome but take place at a nearby medical facility using a specific site located in that area.

Movement data was obtained from the Aircraft Movement Monitoring² system which is used to record aircraft movements at Raglan. The movement data was counted in accordance with the International Civil Aviation Organisation (ICAO) standard with both a landing or a take-off counted as one movement and a "Touch and Go"³ as two movements.

The COVID lockdown from March 25 - April 27 is evident in the movement data with only some movements in that period, probably agricultural aircraft that had a dispensation.

¹ Aircraft are set up so that the main pilot seat and controls are on the left hand side of the cockpit.

² <https://www.aerodromeit.co.nz/>

³ An aircraft operation where the aircraft comes into land on a runway and takes off again without coming to a full stop. Usually done for training or circuit practice.

The large volumes each January seem to be when the Walsh Memorial Flying School⁴ is at Matamata for a few weeks and there are several pilots under training. It was also advised that the Piako Gliding Club often uses Raglan Aerodrome at that time of year for a couple of weeks.

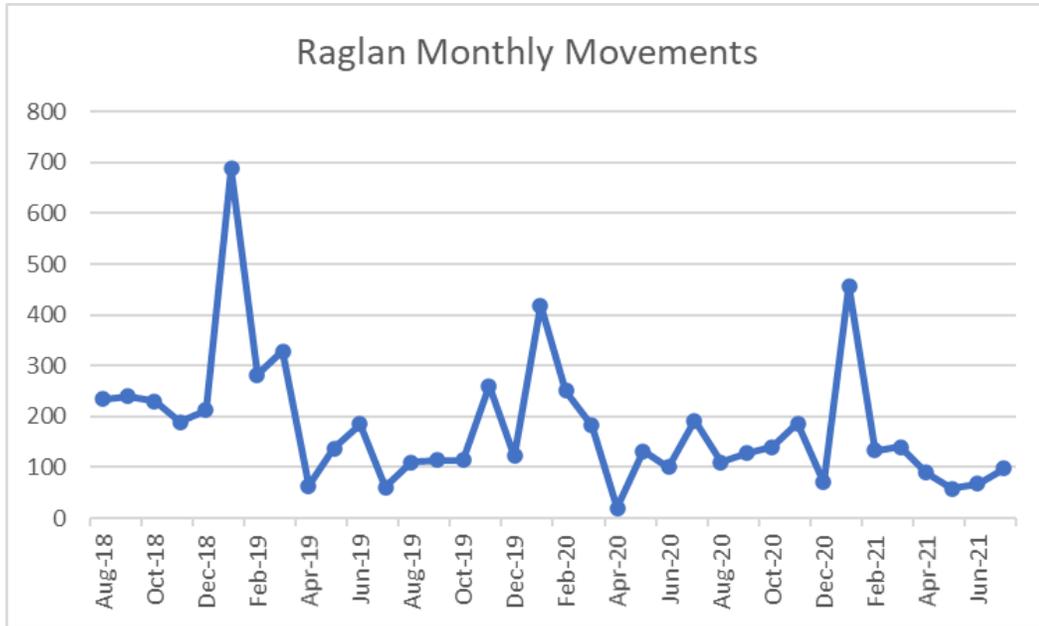


Figure 1 - Raglan Monthly Movements August 2018- July 2021

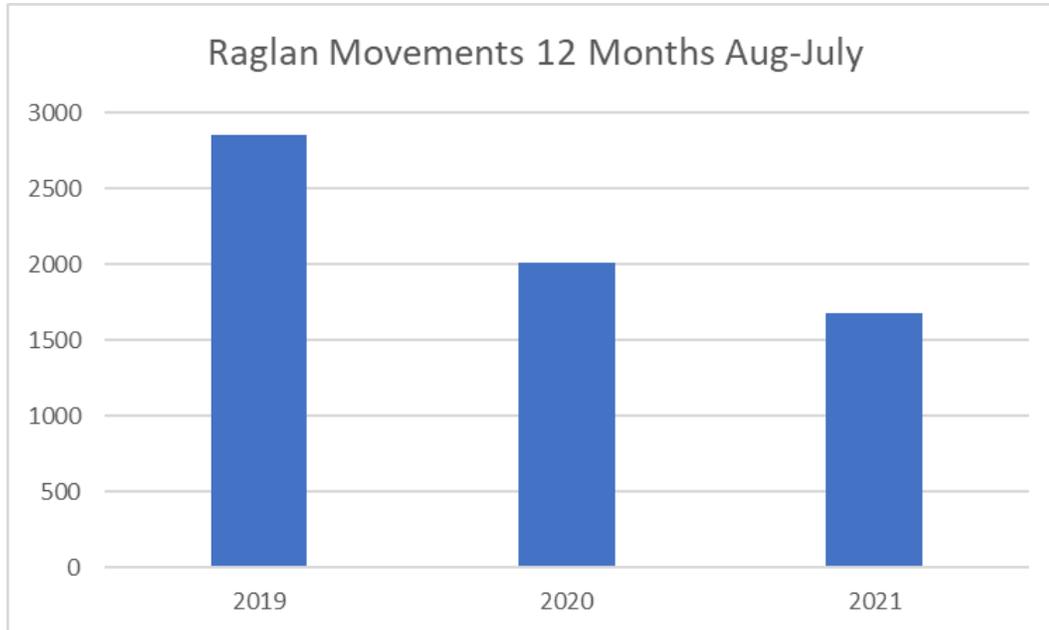


Figure 2 - Raglan Movements 12 Month Periods Aug-July

⁴ <https://scouts.nz/walsh/>

4 Safety Assessment Approach

The approach to the safety assessment was divided into two assessment areas, an on-site visit and then follow up review to produce a report.

Technical and regulatory assessment:

- Aerodrome design, operational and regulatory requirements (Civil Aviation Rules)
- Safety risk management including aerodrome safety specific requirements (Aviation Safety Standards)
- Applicable health & safety provisions (Health and Safety at Work Act 2015)
- Assessment of Aerodrome operations including the associated airspace and interaction with other aviation activities
- Assessment of community concerns/queries and provision of appropriate information

Assessment of safety data, documentation, and information:

Review documents as below:

- Aerodrome management information, reports and records
- Data held on incidents, occurrences or reports by the Civil Aviation Authority of New Zealand
- Waikato District Council records especially use data and related Council held information
- Raglan Community Board information as it relates to the Raglan Aerodrome

Onsite Visit and Consultation:

- Visit aerodrome, assess operations and meeting as required
- As required with Council, Raglan Community Board and interested parties as required

Reporting:

- Report Draft, reviews and final report production

5 Regulatory Requirements

5.1 The Civil Aviation Act

The Civil Aviation Act 1990 (The Act) is the primary legislation that sets the requirements for civil aviation in New Zealand. The Act prescribes a range of requirements for licence holders, certificate holders and “any person” in regard to aviation safety.

Relevant Sections of the Act are:

Section 2 Interpretation

aerodrome—

- (a) means any defined area of land or water intended or designed to be used either wholly or partly for the landing, departure, and surface movement of aircraft; and
- (b) includes any buildings, installations, and equipment on or adjacent to any such area used in connection with the aerodrome or its administration

This section defines an aerodrome and noting that it is a defined area. Currently the area is not defined on the reserve appropriately.

Section 44 Dangerous activity involving aircraft, aeronautical product, or aviation related service

(1) Every person commits an offence who—

- (a) operates, maintains, or services; or
- (b) does any other act in respect of—

any aircraft, aeronautical product, or aviation related service, in a manner which causes unnecessary danger to any other person or to any property.

(2) Every person commits an offence who—

- (a) causes or permits any aircraft, aeronautical product, or aviation related service to be operated, maintained, or serviced; or
- (b) causes or permits any other act to be done in respect of any aircraft, aeronautical product, or aviation related service, —

in a manner which causes unnecessary danger to any other person or to any property.

(3) Every person who commits an offence against subsection (1) or subsection (2) is liable on conviction, —

- (a) in the case of an individual, to imprisonment for a term not exceeding 12 months or a fine not exceeding \$10,000; or
- (b) in the case of a body corporate, to a fine not exceeding \$100,000.

(4) The provisions of this section shall be in addition to and not in derogation of any regulations or rules made under this Act.

A person on the Aerodrome when an aircraft is landing can be “said” to be putting the aircraft at risk by being on the Aerodrome whilst an aircraft is landing or taking off.

5.2 Civil Aviation Rules

As noted previously Raglan Aerodrome is not required to be certificated under Civil Aviation Rule Part 139 as an aerodrome serving regular air transport operations (CAR 139.5), nor has the Director of Civil Aviation required it to be a qualifying aerodrome (CAR 139.5A).

However, as an aerodrome operator the Council must comply with CAR Part 139 Subpart I requirements.

Part 139 defines an **Aerodrome operator** as —

- (1) a person who operates an aerodrome; or
- (2) if no person is identified in paragraph (1), a person who is responsible for the management of that aerodrome; or
- (3) if no person is identified in paragraphs (1) or (2), a person who is occupying the land forming that aerodrome; or
- (4) if no person is identified in paragraphs (1), (2), or (3), the registered proprietor of the land forming that aerodrome.

Subpart I — Operating requirements – non-certificated aerodromes

139.501 Application of Subpart

- (a) Except as provided in paragraph (b), this Subpart applies to an aerodrome operator.
- (b) This subpart does not apply to:
 - (1) an aerodrome operator certificate holder:
 - (2) a qualifying aerodrome operator certificate holder:
- (3) the operator of an aerodrome that is used or intended to be used exclusively by aircraft engaged in agricultural operations.

139.503 Unsafe conditions

An aerodrome operator to which this subpart applies must establish procedures to ensure that aircraft movements are restricted or prohibited on parts of the aerodrome where an unsafe condition exists.

139.505 Reporting traffic volumes

An aerodrome operator to which this subpart applies must—

- (a) provide the Director with an annual report of traffic movement data for the aerodrome; and
- (b) if requested in writing by the Director, collect and report traffic movement data for the aerodrome.

CAR 139.503 puts onus on WDC to ensure safety on the aerodrome if an unsafe condition exists. Whilst the CARs do not define “an unsafe condition” it is apparent this is a condition where a person or persons is exposed to risk or harm.

Allowing persons or dogs on or near to the runway is an unsafe condition and the WDC as the aerodrome operator may be in breach of CAR 139.503. In accordance with 139.503 they are obligated to take reasonably practical steps to identify and eliminate such risks.

Pilot Requirements

Pilots also have requirements to ensure the safety of persons and property on the ground with minimum operating altitudes and distances from people and property during flight. When operating at an aerodrome a pilot must comply with CAR 91.127 Use of Aerodromes in particular:

91.127 Use of aerodromes

- (a) No person may use any place as an aerodrome unless that place is suitable for the purpose of taking off or landing of the aircraft concerned.
- (b) No person may operate an aircraft at an aerodrome unless—
 - (1) that person complies with any limitations and operational conditions on the use of the aerodrome notified by the aerodrome operator; and
 - (2) the runway, heliport, or water channel, is equipped with operable lighting, appropriate to that type of aircraft, when landing or taking off at night, and the lighting is activated; and
 - (3) that person manoeuvres the aircraft clear of any manoeuvring area or part of any manoeuvring area that has been notified or marked as unsafe for aircraft use by the aerodrome operator; and
 - (4) ***the runway, heliport, or water channel is clear of all persons, animals, vehicles, vessels, or other obstructions during landing or take-off, other than persons, vehicles, or vessels essential to the operation.***

Therefore, the pilot must determine that the runway is safe before executing a landing or a take-off manoeuvre and must not operate if people or animals are on the runway.

5.3 Health and Safety at Work Act

WDC is a “person conducting a business or undertaking” (PCBU) and has responsibilities under the Health and Safety at Work Act (HSWA) (2015).

In particular HSWA s30(2):

30 Management of risks

- (1) A duty imposed on a person by or under this Act requires the person—
 - (a) to eliminate risks to health and safety, so far as is reasonably practicable; and
 - (b) if it is not reasonably practicable to eliminate risks to health and safety, to minimise those risks so far as is reasonably practicable.
- (2) A person must comply with subsection (1) to the extent to which the person has, or would reasonably be expected to have, the ability to influence and control the matter to which the risks relate.

The council manages and administrates the land therefore they do have the ability to influence and control the aerodrome risks. Therefore, they also have a duty of care to users and other persons on the aerodrome.

36 Primary duty of care

- (2) A PCBU must ensure, so far as is reasonably practicable, that the health and safety of other persons is not put at risk from work carried out as part of the conduct of the business or undertaking.

The WDC know about the people and dogs on the aerodrome and must take all reasonably practical steps to eliminate the hazard and risk.

6 Occurrence Data

6.1 CAA Occurrence Data

A request was made to the Civil Aviation Authority for occurrence, incident and accident data they hold for Raglan Aerodrome. The request was for the previous 5 years being an appropriate timeframe to provide an assessment of data for recent years and prior to COVID-19 impacts.

The information was provided and consisted of six distinct data sets as detailed below.

The associated Civil Aviation Rule definitions⁵ are:

ACC- Accident means an occurrence that is associated with the operation of an aircraft and takes place between the time any person boards the aircraft with the intention of flight and such time as all such persons have disembarked and the engine or any propellers or rotors come to rest, being an occurrence in which—

- (1) a person is fatally or seriously injured as a result of—
 - (i) being in the aircraft; or
 - (ii) direct contact with any part of the aircraft, including any part that has become detached from the aircraft; or
 - (iii) direct exposure to jet blast—

except when the injuries are self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to passengers and crew; or
- (2) the aircraft sustains damage or structural failure that—
 - (i) adversely affects the structural strength, performance, or flight characteristics of the aircraft; and
 - (ii) would normally require major repair or replacement of the affected component—

except engine failure or damage that is limited to the engine, its cowlings, or accessories, or damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents, or puncture holes in the aircraft skin; or
- (3) the aircraft is missing or is completely inaccessible:

ADI – Aerodrome Incident means an incident involving an aircraft operation and—

- (1) an obstruction either on the aerodrome operational area or protruding into the aerodrome obstacle limitation surfaces; or
- (2) a defective visual aid; or
- (3) a defective surface of a manoeuvring area; or
- (4) any other defective aerodrome facility:

ARC – Aviation Related Concern. A process that allows anyone to report an ‘aviation related concern’. You don’t have to be involved in the aviation community to report something you see or hear that you think might harm aviation safety or security, or that might even be breaching Civil Aviation Rules.

⁵ Civil Aviation Rule Part 1 and Civil Aviation Rule Part 12 – www.aviation.govt.nz/rules

ASP - Airspace incident means an incident involving deviation from, or shortcomings of, the procedures or rules for—

- (1) avoiding a collision between aircraft; or
- (2) avoiding a collision between aircraft and other obstacles when an aircraft is being provided with an Air Traffic Service:

DEF – Defect incident means an incident that involves failure or malfunction of an aircraft or aircraft component, whether found in flight or on the ground:

INC – Incidents means any occurrence, other than an accident, that is associated with the operation of an aircraft and affects or could affect the safety of operation

6.2 Reporting Requirements

The source of the CAA data is from reports made to the CAA. The New Zealand Aviation system is built upon the Act and the CARs made under that Act. The Act requires licence holders and certificated organisations to report accidents and incidents:

Section 26 Obligation to notify all accidents and incidents

(1) The pilot-in-command of any aircraft that is involved in an accident shall notify the accident to the Authority as soon as practicable.

(1A) Every person who—

- (a) operates, maintains, or services, or does any other act in respect of any aircraft, aeronautical product, or aviation related service; and
- (b) is involved in an incident, —

shall, where required to do so under rules made under this Act, notify the incident to the Authority.

(2) If, due to injuries or death, the pilot-in-command is unable to give the necessary notice under subsection (1), the operator shall provide the necessary notice.

(3) The co-ordinator of any search and rescue operation for any aircraft shall notify the Authority of the operation as soon as practicable.

(4) The Authority may on being notified under subsection (1) or subsection (1A) or subsection (2) or subsection (3) request such additional information, in such form as the Authority considers appropriate in each specific case, and the pilot-in-command or operator or person of whom the request is made shall provide the additional information forthwith.

6.3 Data Analysis

6.3.1 Total Reports

A total of 32 occurrences covering 6 specific reporting criteria were reported regarding Raglan Aerodrome.

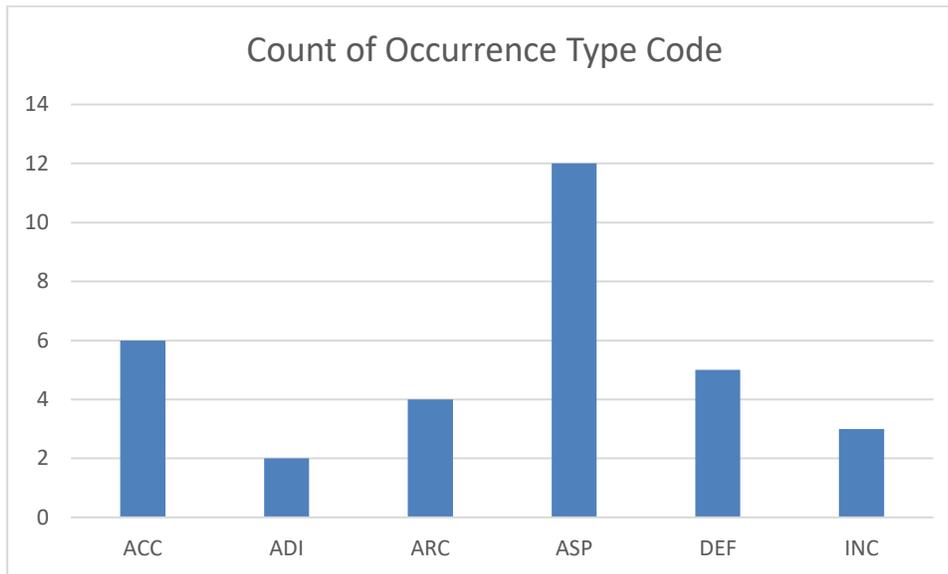


Figure 3 Raglan Aerodrome Reported Occurrences to the CAA

An analysis of the data excluded several as not being relevant to this study including the twelve Airspace Incidents (ASP) which did not relate directly to safety concerns on the Aerodrome, and the five Defect incidents (DEF) which did not relate directly to safety concerns on the Aerodrome but were aircraft related.

Two of the three Incidents (INC) did not relate directly to safety concerns on the Aerodrome.

Incident 16/6168 04 November 2016 is of interest as it was in regard to a marker cone and the cone being removed – this links directly to lack of aerodrome layout definition.

6.3.2 Accidents

Six accidents, being one per year, are recorded in the CAA data. All accidents occurred on approach and landing. Approach and landing is the highest risk phase of a flight for a pilot.

One accident occurred on a beach to the north and the damage was found when landing at Raglan. This is included as it was the result of turbulence which is also a factor at Raglan.

The accidents can be further classified as approach, overrun and turbulence.

Approach: In December 2018 an aircraft on approach entered a low level spin and crashed into the harbour. Two person on board died.

Turbulence: One incident in 2019 occurred on a beach north of Raglan due turbulence and damage was noticed on landing at raglan. The other incident occurred in November 2020 when the aircraft wing hit the ground on landing due to possible windshear.

Overrun: June 2016 an aircraft went through the boundary fence and 100 metres into the paddock rendering the aircraft unserviceable. January 2017 the aircraft hit the fence at the end of the runway. May 2021 the aircraft went through the fence at the end of the runway.

* Note one accident occurred after a go-around by the pilot due to pedestrians on the runway.

CAA Occurrence Data

ACC	MA	21-May-21	Landing Accident. First attempt to land the pilot carried out a go-around, landed off the second approach, applying brakes the aircraft skidded on the wet grass and went through the fence at the end of the runway. No injuries, damage to aircraft.	Overrun
ACC	MI	18-Nov-20	Port wing dropped immediately before touchdown and contacted ground, probably due wind shear. Damage - bent pitot tube and rippled upper wing panels.	Turbulence
ACC	MI	09-Nov-19	Attempting to land on beach 8 miles north Raglan in turbulent conditions caused the plane to drop and bounce. Decided to go around and not land. Returned to Raglan and landed no problem. Noticed plane not quite level on taxiing. Main landing gear leg right hand side bent. This has been reported to SAC as an incident of minor damage.	Turbulence
ACC	CR	17-Dec-18	During approach to land at NZRA, the aircraft was observed by witnesses to turn and then enter a spin to the left at low altitude. There was insufficient height available for the pilot to recover from the spin, resulting in the aircraft striking the mud flats in the harbour. Both persons on board received fatal injuries.	Approach
ACC	MA	08-Jan-17	Aircraft landed downwind and failed to stop in time to avoid fence at end of the runway. The prop wrapped around the fence wire. Level 1 CAA investigation revealed misjudgement of tail wind component by pilot. During investigation various issues with the aircraft operator became apparent, and were passed to Special Flight Ops and Recreational Aviation Unit for their attention. SIU level 1 investigation closed.	Overrun
ACC	MI	02-Jun-16	Minor landing accident. Touched down too fast, unable to stop, overran the airstrip going through the boundary fence. No injuries. The aircraft ran through the fence at the end of the runway and came to rest about 100m into the next paddock. The aircraft was suffered damage that required it to be moved by truck to a repair facility. The pilot stated that he was attempting a second approach after a go-around due to pedestrians crossing the runway. He described having an aiming point but had trouble maintaining that approach profile. The aircraft then floated during the flare and once the nose wheel was on the ground, he realised he only had about 50m to stop. After the accident he also noticed he had landed with a slight tail wind that was not noticeable by observing the windsock while he was in the air. The pilot advises that he will seek additional airstrip flying and tuition as a result of this accident.	Overrun

6.3.3 Aviation Related Concerns

Four Aviation Related Concerns were officially recorded by the CAA.

ARC	MI	04-Jul-21	Aircraft landed as pedestrian and their dog walking in the middle of the Aerodrome.	Person on Runway
ARC	MI	20-Jan-20	Anonymous concern video shows 2 gliders flying well under 500 ft altitude without need to do so. already reported and investigated 19/9241 20/ARCG/148	Low Flying
ARC	MI	09-Nov-19	Failure to report minor accident concern	Reporting
ARC	MI	11-Aug-18	Concern regarding low flying ag A/C over owner's house	Low Flying

6.3.4 Aerodrome Incidents

Two Aerodrome Incidents were recorded in the CAA database, and both were in regard to people on the runway.

ADI	MA	14-Feb-21	Pedestrian noted crossing active runway 05 during take-off roll. Pilot had to make a minor directional correction to ensure the aircraft passed far enough from the pedestrian to avoid further danger.	Person on runway
ADI	MI	21-Feb-16	Take-off aborted due to a woman running across the runway, 100 metres in front of the motor glider. Glider swerved left, narrowly missing her.	Person on runway

6.4 Raglan Aerodrome Landing Factors

From analysis of the reports there are two main hazards at Raglan Aerodrome:

1. Raglan Aerodrome approach is influenced by winds that can make it challenging.
2. Persons on the runway add complexity for the pilot on final approach.

The wind issue for pilots has been highlighted by the CAA in a Vector⁶ article in January/February 2012 along with the terrain and obstacles in the aerodrome environment. The article is attached as Appendix D.

The wind cannot be mitigated but pilots can be informed and prepared. Terrain and obstacles can be mitigated, and this is discussed in the Aerodrome design section.

The runway length is also relatively short, but this depends on the aircraft that is to be operated and the particular aircraft performance. What this does is limit the size and type of aircraft that operate at Raglan Aerodrome. So single engine, light aircraft tend to be the type to operate at Raglan.

The issue of persons and animals on the runway is the other hazard and one that can be mitigated. This is addressed in the Aerodrome design section, but some commentary is needed here.

⁶ Vector is the CAA Safety Education Magazine that is sent to pilots and published on the CAA website www.caa.govt.nz

6.5 Approach and Landing

The approach and landing phase is the most critical stage of an aircraft's operation and the one with the highest workload for the pilot. Most accidents occur in the landing phase which is consistent both in New Zealand and internationally. Figures show that around 40-50% of all accidents occur during the landing phase of aircraft operations.

A range of documents and studies support this including those from the Flight Safety Foundation, the International Civil Aviation Organisation, Federal Aviation Administration (United States of America) and the European Safety Agency. The CAA Aviation Safety Report⁷ for 1 January to 31 December 2019 details 40% of accidents during the landing phase.

Flight Phase

The following table shows the flight phase recorded for accidents for the ten one-year periods ending 31 December 2019. The figures include all aircraft types.

Flight Phase	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
LANDING	43	37	35	48	42	48	44	40	39	44
TAKEOFF	19	20	11	17	20	16	12	17	14	12
CRUISE	5	14	7	16	13	14	8	11	13	7
UNKNOWN	2	1	2	2	5	3	5	14	5	3
APPROACH	3	8	5	5	9	3	6	2	4	5
CLIMB	8	8	2	6	8	7	3	3	5	5
PARKED	4	2	5	5	0	3	3	1	0	3
DESCENT	6	0	6	4	3	6	2	5	3	7
HOVER	4	4	2	5	1	3	2	0	2	1
AGRICULTURAL MANOEUVRES	3	1	5	2	2	2	1	1	2	4
TAXIING	3	5	3	3	4	5	1	3	1	6
HOVER TAXI	0	0	1	2	0	0	1	0	0	1
CIRCUIT	1	1	0	0	1	0	0	2	0	1
Not Recorded	5	7	4	4	2	0	0	2	2	5
HOLDING	0	0	0	0	0	0	0	0	0	0
AEROBATICS	0	0	1	0	1	0	0	1	0	0

The most common phase of flight during which accidents occurred in the year ending 31 September 2019 remains the landing phase (40%). This proportion of accidents by flight phase is largely unchanged from previous years and reflects the fact that landing is generally the highest risk phase of flight.

The CAA have produced a “Good Aviation Practice” booklet on landing and take-off which provides additional information on the critical stage of a flight. <https://www.aviation.govt.nz/assets/publications/gaps/Take-off-and-landing-performance.pdf>

At Raglan the ability of the pilot on approach to see persons or animals on the runway may be limited. Reasons include:

- High approach angle to the runway due to terrain and trees on approach

⁷ CAA Aviation Safety Report accessed from the www.caa.govt.nz website 16 August 2021

- The nose attitude of the aircraft will be high for approach and the pilot view is limited to the touchdown area and beyond they are aiming for. They may not see people or animals in the preceding area
- The large area that the aerodrome is on means the pilot is focussed on just the intended landing area
- High workload in the cockpit to control the aircraft in windy conditions at Raglan Aerodrome
- The runway length must be suitable to the aircraft performance, but the terrain and winds may cause the aircraft to be higher on approach than the pilot may expect

The ability for the pilot to see people and animals at this critical stage of flight may result in the pilot having to land rather than apply power and “go around”. On approach the aircraft is at minimum power, with aircraft flaps down to slow the aircraft and pilot inputs need to be smooth and precise. If the aircraft is low the safest manoeuvre may be to continue the landing and attempt to avoid the person or animal.

If they need to “go around” the pilot needs to apply full power and raise the flaps whilst also controlling the aircraft – a very high workload, possibly stressful operation. A situation that can lead to an incident or damage to the aircraft (the aircraft body may be damaged due to overstressing during a full power go-around).

Information provided identifies that the high workload and pilot considerations on landing may not be well understood by persons on the aerodrome and local community.

7 Airfield Visit

An on-site Aerodrome visit was completed on Monday 2 August. Mike Haines and Rob Ashley (WRC Community Assets Manager / Acting Team Leader OSM) visited the aerodrome.

An Aerodrome inspection was undertaken prior to a meeting with the Raglan Community Board and other local representatives on the aerodrome.

7.1 Aerodrome Inspection

The Aerodrome inspection started at 1230 and was proposed to use a standardised Aerodrome Inspection Checklist, however as the Aerodrome lacked the normal Aerodrome components the checklist was not used.

Three aircraft were on the Aerodrome:

ZK-SLL Cessna 182 - Sky Lane Limited, Auckland (Departed soon after we arrived)

ZK-MDV Cessna 172– Air Auckland Limited, Ardmore Airport (Departed after 1pm)

ZK-IRR Guimbal Cabri G2 - Cirrus Helicopters Limited Drury (Departed after 1pm)

The Aerodrome is part of a large reserve area that is fenced on all sides except the northwest area from the start of Runway 05 to the treeline as depicted on the AIPNZ chart.

The Aerodrome is not defined by any markers of any form and certainly no runway or runway threshold markers. Some marking on the grass (possibly diesel or dye) seems to outline an area of the runway but it does not match the published Aerodrome dimensions. The only indications of an aerodrome apart from some signage on gates are the windsocks at the two vector thresholds.

The inspection commenced at the car park beside the Holiday Camp then along the Aerodrome starting at RWY 23 threshold down the southern side, crossed the central walkway area, on to the beach at the beach

access point to the northwest, then back on Aerodrome along northwest tree line to the area beside the fuel tank adjacent to the RWY 23 Threshold. Photos were taken and are included in Appendix C.

Trees were noted on the approach to Runway 23 in addition to the Norfolk pine that is detailed in the AIPNZ. Operational area warning signage was on the Northern Carpark gate, Southwest access gate and Beach access area (although only at one point but at another area close by).

The runway is published in the AIPNZ as being 60 metres wide, but the area has no visible boundary or operational area markers, and it appears that the whole area is used as a runway.

The refuelling site is not shown on the AIPNZ chart and does not appear to be in use or properly protected.

7.2 Meeting with Community Board and local representatives

An onsite meeting and discussion was held with Gabrielle Parson (Raglan Community Board Chair), Chris Rainer (Raglan Community Board), Alan Vink, and Ra Puriri.

A range of issues were discussed related to Aerodrome operations and safety including locals concerns and interactions with the CAA staff. Some specific information and details on aviation requirements was provided to assist and also to ensure a correct understanding.

The discussions were very productive and provided valuable input to the review. Their open and honest approach was appreciated as was their willingness to listen and take some advice.

7.3 Community queries

Some commentary on community queries that have been raised:

- Concerns on airfield's proximity to the urban areas of Raglan and possibility of an aircraft accident.
The location in relation to the urban areas is not a significant hazard in regard to an aerodrome location. The area does not have major terrain constraints. There is always a risk of engine failure on take-off or approach but the north-west is clear and the north-east has a good turn towards the north and out over the sea.
- Pedestrian warning light system
Pedestrian light system would be difficult to manage and maintain. May lead pedestrians to rely on the light system and not check for aircraft operating. It would need activating from the cockpit which could be done but would need monitoring and be visible to all. Would it be used regularly and what occurs when it is out of service.
- What is the actual safety risk associated with pedestrians and aircraft? Could it not be managed similar to train crossings?
If there was a single point of crossing it may be feasible. But this may require a fixed gate (in a fence) where people would look for the aircraft, then gauge how far away it is and then cross. The pilot may still have concerns then decide to go around which so does not address the problem.
- Can the airfield be split use? Some days are designated for community use and vice versa.
Yes, airfield can be closed on certain days, but the general public and the pilots would probably like to use the airfield at on the same days. Pilots may also not know or be confused on operation hours and still try to access the airfield.

8 Risk, Controls and Issues

8.1 Risk Management

WDC as the Aerodrome Operator should have a Risk Register so that all risks at the aerodrome are identified and that appropriate mitigations are in place. This should form part of the overall Raglan Aerodrome Risk Management system.

The current Risk Register has two risks identified are:

1. Aircraft and pedestrian/dog collision on the Raglan Airfield
2. Objects on runway surface

A full Aerodrome Risk register needs to be developed with appropriate mitigations and controls. This is consistent with HSWA requirements and also aviation safety management systems. Most people are familiar with hazards and risks as these are now common themes with a wide range of media communicating to use on these concepts including health and safety legislation, insurance requirements and road safety campaigns.

A hazard is a source of harm and doesn't cause an issue until a person is exposed to it and then it is a risk⁸. There are numerous definitions and explanations along with a range of risk assessment tools and methods. The table below details common aerodrome hazards, and some observed during the Raglan aerodrome visit. The table outlines what hazards exist of Raglan and propose some controls if none are currently in place.

8.2 People on the Aerodrome

The greatest risk to both people and pilots is general public walking across an active aerodrome. Normally aerodromes are designed to prevent access by people and animals to the runway and operational areas. Having people or animals access the runway can lead to a "runway incursion" which is high risk for aviation safety.

The International Civil Aviation Organisation definition of a runway incursion is "Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take off of aircraft".

Runway Incursion is one of the High Risk Categories (HRC) in their Global Aviation Safety Plan 2022-2022 and is included in the international ICAO Runway Safety programme⁹. In New Zealand the CAA notes¹⁰ approximately 5-10 occur in New Zealand every month and have the potential to result in fatal collisions.

People on a runway is an unsafe condition, and the council must establish procedures to prohibit or restrict aircraft movements when a known unsafe condition exists.

The WDC is the aerodrome operator and the PCBU so they must satisfy themselves that they are taking all reasonable steps to eliminate or minimise any perceived or material risk (or unsafe condition). There are several options available to the council in regard to methods deployed to separate persons from aircraft (eliminating or minimise) on council managed and administered land. These are detailed later in this report.

⁸ Worksafe Definitions and acronyms <https://www.worksafe.govt.nz/the-toolshed/definitions-and-acronyms/#If-doc-29593>

⁹ <https://www.icao.int/safety/RunwaySafety/Pages/default.aspx>

¹⁰ <https://www.aviation.govt.nz/airspace-and-aerodromes/aerodromes/runway-safety/>

Raglan Aerodrome Hazard Assessment

Hazard	Assessment	Control
Non-standard aerodrome facilities	The Aerodrome is on one large area of land. Apart from two windsocks and some signage on gates a person would not know it was an aerodrome. No aerodrome markers or runway identification are in place. No identification of aircraft parking area.	Review the Aerodrome and upgrade to meet minimum CAA design standards guidance material. Parking area should be clearly designated.
Unauthorised vehicle access to aerodrome	Vehicle access is currently limited and access gates have padlocks. Contractors mow the aerodrome on a regular basis. I have found no specific aviation procedures for WDC contractors.	Ensure padlock access is controlled. New aerodrome procedure required. This could include the issuing of a NOTAM ¹¹ when works are being conducted on the aerodrome, an aviation radio required to monitor pilot calls, and specific aerodrome training.
Noise	No specific requirements in place for people on the aerodrome or restrictions for aircraft. It was noted in correspondence and during the onsite discussion that noise can be an issue when community or special events are on e.g., a Tangi	Ensure people are aware of aircraft noise on aerodrome and consider remaining clear due to noise. Ability to issue a NOTAM or close the aerodrome during special events.
People on runway	The current situation produces a high risk to members of the public and pilots. The public needs to remain clear of the active aerodrome, particularly whilst aircraft are operating but should also remain clear at all times as an aircraft operation may take place at any time.	Clearly identify the aerodrome and the runway so people can remain clear. Install a fence to prevent inadvertent access to the aerodrome and runway.
Wildlife hazards – Birds and Animals	Due to the aerodrome location birds are present and create a hazard to aircraft. Dogs are a major hazard at all aerodromes. In most aerodromes access to the airfield prevents the dog hazard becoming a risk.	Ensure aerodrome management plan for birds which may include a grass management strategy to discourage nesting or accessing a food source. Suggest note added to AIPNZ. Install a fence to prevent inadvertent access to the aerodrome and runway. Require dogs to be on a leash when on the areas where the aerodrome is located.

¹¹ Notice to Airmen - means a notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations: Civil Aviation Rule Part 1.

<p>Obstacles</p>	<p>The AIPNZ chart notes a tree to northeast as an obstacle. It also displays the trees to the northwest.</p> <p>Without the edge of the runway and the runway strip being defined it was difficult to assess if there was sufficient obstacle clearance of the runway surfaces.</p>	<p>No Obstacle Limitation Surface (OLS) survey was available for Raglan Aerodrome. The OLS protects the aircraft operations and also defines areas where people and property are clear of the aerodrome operational areas.</p> <p>An OLS survey is needed to confirm the safety of aerodrome operations.</p> <p>An OLS should also establish if the vehicle parking area to the north should have a maximum vehicle parking height.</p>
<p>Dangerous Goods</p>	<p>The AIPNZ does not show any fuel facility at Raglan. However, a Jet A1 fuel facility is located in the northwest corner. It is not known if this is in use, empty or if properly maintained.</p>	<p>WDC needs to follow up on the fuel facility to see who owns it and if it is in use and properly maintained.</p> <p>If retained, it needs to be shown on the AIPNZ chart and if it is available for use.</p>
<p>Incorrect published information</p>	<p>The AIPNZ information seemed correct except that the 60 metre runway was not clearly defined.</p>	<p>WDC to ensure the AIPNZ information is amended when any changes are made to the aerodrome, or any information is identified as not being correct or missing.</p> <p>Suggest an AIPNZ information check in September each year before the busy Spring/Summer period.</p>
<p>Weather – Winds, fog</p>	<p>The incidents at Raglan suggest that wind conditions can be problematic and cause problems for pilots when encountered. This is reinforced by a CAA Vector article as noted earlier.</p>	<p>Update AIPNZ to include note on possible turbulence and sudden changes in wind direction. Consult local pilots as required for wording.</p>
<p>Aircraft propellers, rotors and engines</p>	<p>As the public can mingle with aircraft operating not only on the runway but also the parking area additional signage and warnings are needed.</p>	<p>Suggest some additional signage on aircraft operations and dangers especially at the main access gate.</p>
<p>Foreign Object Debris (FOD)</p>	<p>The airfield surface was in good condition with no FOD. It was noted that no tree or related natural debris was evident.</p> <p>It was advised that the aerodrome is used for various events and some people play sport on the area e.g., Golf.</p>	<p>Ensure procedure in place after events on the aerodrome to ensure no loose items, rubbish or objects that can damage a landing aircraft, damage a propeller or be ingested into an engine are present.</p> <p>If sports are undertaken, then all equipment and balls are removed especially golf balls.</p>
<p>Runway Surface Condition</p>	<p>The grass surface was in good condition. It seemed well maintained.</p>	<p>Ensure procedure to monitor aircraft surface and issue NOTAMs or close when the surface becomes soft, breaks up or is unsuitable for aircraft operations.</p>

8.3 Risk assessment – People on a runway

A risk assessment using a standardised aerodrome specific risk assessment model¹² of people on the runway at Raglan identified a high risk. Noting this covers the person and the pilot.

This is based on the worst case but is highly likely as occurrences have identified that such events can occur.

Person on the runway at Raglan Aerodrome:

Likelihood	Severity	Risk
Frequently	Minor	Medium
Probable	Hazardous	High
Remote	Catastrophic	High

Severity \ Likelihood	No Safety Risk	Minor	Major	Hazardous	Catastrophic
Frequently	L5	M13	H20	H22	H25
Probable	L4	M12	M15	H21	H24
Remote	L3	L8	M14	M17	H23
Extremely Remote	L2	L7	L10	M16	M19
Extremely Improbable	L1	L6	L9	L11	M18

Low	Medium	High
No Action Required	Monitor, Determine if Risk can be Mitigated to a Low Risk	Must be Mitigated to a Medium Risk

¹² National Academies of Sciences, Engineering, and Medicine. 2015. *A Guidebook for Safety Risk Management for Airports*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/22138>.

Definitions for Severity and Likelihood

Severity:				
	People	Assets	Environmental	Reputation
Catastrophic	Fatality+	Loss of an aircraft/or over \$1,000,000 dollars in damage/or loss of critical system(s) for an extended period of time	A spill or release that is not contained and results in long-term damage to the environment and fines to the airport.	An event or a series of events resulting in the community NOT using XXX for an extended period of time.
Hazardous	Severe Injury, requiring hospitalization	Damage to an aircraft taking it out of service for an extended period of time/or damage in excess of \$500,000/or disruption of critical services for extended period of time	A reportable spill or release that requires mitigation.	An event or a series of events resulting in the community lessening the use of XXX causing negative (annual) financial or operational impacts.
Major	Minor Injury requiring medical treatment	Damage to an aircraft that is repairable/or damage to equipment or facility that is repairable within a short period of time.	A reportable spill or release that is contained.	An event or a series of events resulting in the community lessening the use of XXX for a short period of time.
Minor	Minor injury not requiring medical treatment	Minor damage to an aircraft, equipment, or facility not requiring it to be taken out of service	A spill or release that does not require a report.	An event or a series of events resulting in the community questioning the reliability of XXX.
No Safety Risk	No injury	No Damage	No Impact	No Impact
Likelihood:				
Frequently	<i>Occurs once every <u>month</u> or XXXX commercial operations or XXXXXX passenger enplanements</i>			
Probable	<i>Occurs once every <u>year</u> or XXXXX commercial operations or XXXXXXXX passenger enplanements</i>			
Remote	<i>Occurs once every <u>5 years</u> or XXXXXXXX commercial operations or XXXXXXXXXX passenger enplanements</i>			
Extremely Remote	<i>Occurs once every <u>10 years</u> or XXXXXXXX commercial operations or XXXXXXXXXX passenger enplanements</i>			
Extremely Improbable	<i>Occurs once every <u>20 years</u> or over XXXXXXXX commercial operations or XXXXXXXXXX passenger enplanements</i>			

9 Aerodrome Design

9.1 Aerodrome Layout

The current Aerodrome lacks a number of basic aerodrome design components including marker boards to denote the runway thresholds, runway edge and runway end. This can be a common issue at regional aerodromes but often there is also a fenced area preventing access to the aerodrome. CAA Advisory Circular 139-7 provides guidance on aerodrome design and facilities for non-air transport operations.

Currently the runway and the runway strip are not clearly defined on the ground area. Defining these areas and the associated obstacle limitation surfaces will allow the required area for the aerodrome to be established and then appropriate options for interaction with people to be developed.

The following definitions are from CAA Advisory Circular 139-7:

Obstacle limitation surfaces mean defined areas about and above an aerodrome intended for their protection of aircraft in the vicinity of an aerodrome.

Runway means a defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

Runway strip means a defined area including the runway, and stopway (if a stopway is provided), that is intended—

- (1) to reduce the risk of damage to an aircraft running off the runway; and
- (2) to provide obstacle protection for aircraft flying over the runway strip during take off or landing operations:

Threshold means the beginning of that portion of the runway usable for landing.

9.2 Runway and Runway Strip

CAA Advisory Circular 139-7 provides guidance on runways and runway strips.

Width of runways

For a runway used only during the day and for visual flying¹³, the minimum runway width should be twice the outer main gear wheel span (OMGWS) of the aeroplane to be operated. For example, a Cessna 172 OMGWS is approximately 2.7 metres so requires 5.4 metres. A runway width of 10 m would be more than adequate for the aircraft typically using the aerodrome.

Runway strip

A runway should be symmetrically included in a runway strip. Often at regional aerodromes the runway strip is published rather than a specific runway area. The runway strip adds more protection to aircraft operations and people or property on the ground for the runway.

A runway strip should extend beyond each end of the runway for a distance of at least 10 m where the runway is less than 800 m in length or 30 m where the runway is 800 m or more in length.

Width of runway strips

For a day visual runway, the minimum width of the runway strip should be two and a half times the wingspan of the aeroplane to be operated, or 30 m, whichever is the greater. For example, a Cessna 172 has an 11 metre wingspan which equates to 27.5 metres. Therefore, a minimum runway strip width of 30 m would be required.

9.3 Raglan Configuration

Currently the aerodrome is published as a 60 metre wide runway and 646 metres in length. Where no separate runway width is published it is assumed that entire 60 m width is available for the landing or take-off of the aircraft. In these situations, the runway width and the strip width are coincidental.

Considering the type of aircraft operating at the aerodrome and what the community wants to have operating the current runway area may wider than is required.

¹³ Visual flying is under Visual Flight Rules (VFR) and means that ground based instrument navigation aids are not used.

The following table provides comparisons to similar aerodromes in the AIPNZ. Raglan has a rather wide published runway compared to other aerodromes in relation to the runway length. The runway length determines the size and type of aircraft that can operate.

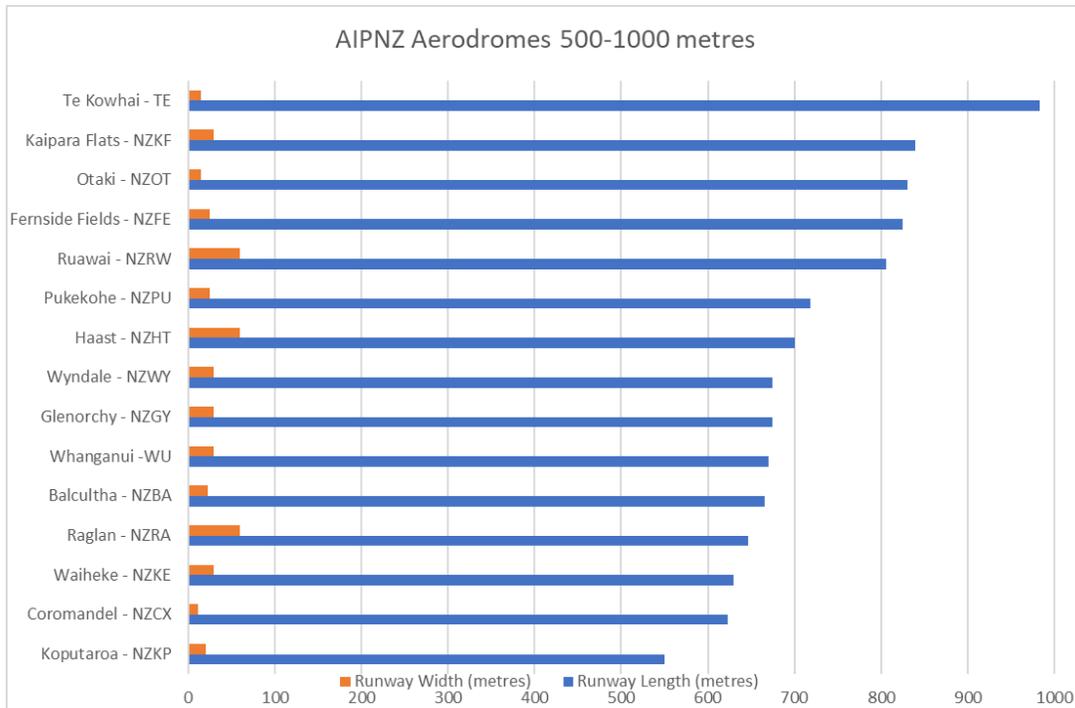


Figure 4 AIPNZ Aerodromes of similar operations

The available runway length required for an aircraft is dependent on a number of factors including the aircraft all-up weight including passengers, freight and fuel; the height of the aerodrome above sea level; and the air temperature on the day – the higher the temperature longer the runway needed. Even within an aircraft type the particular and configuration can make a difference. For example, a Cessna 172 varies in performance between a “D” model at 2,300 pound gross weight with a 175 Horsepower engine and a “P” model at 2,400 pound gross weight with a 160 Horsepower engine.

The figure below compares runway width at Raglan Aerodrome to similar size aerodromes. Based on the aircraft operating at Raglan and the runway length available then a 30 metre wide runway strip with 10 metres at each end would be appropriate.

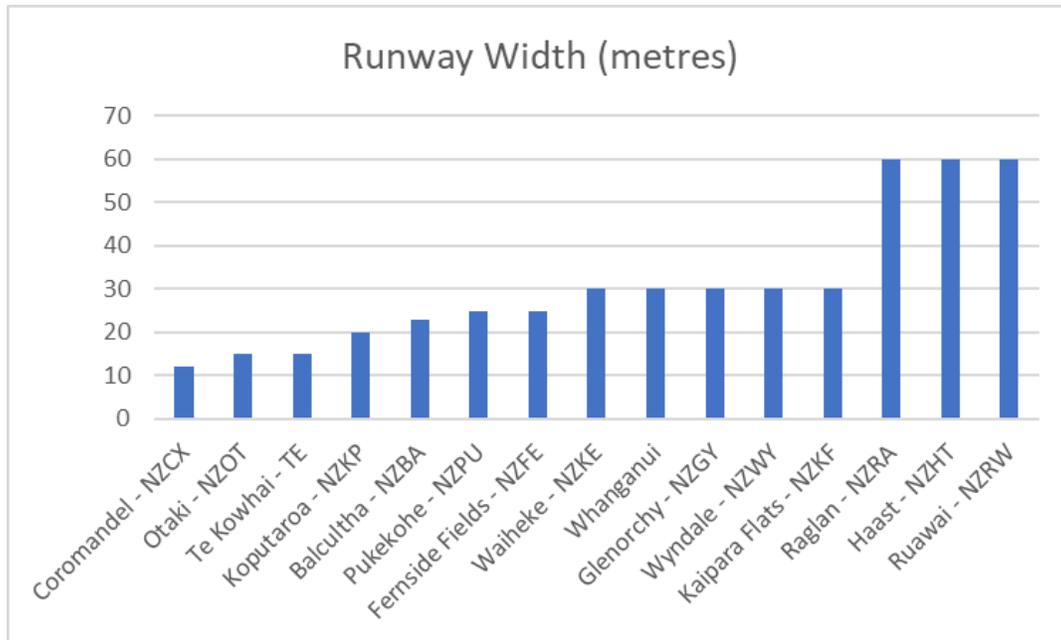


Figure 5 Similar Aerodromes Runway Width

9.4 Obstacle Limitation Surfaces

CAA Advisory Circular 139-7 provides guidance on the Obstacle Limitation Surface to protect the aerodrome. WDC needs to establish these surfaces so that the aerodrome operational area can be defined. The runway should be provided with take-off climb and approach surfaces so aeroplanes taking off or landing have a clear obstacle free surface over which to carry out the initial part of the climb or final part of the approach.

A boundary fence could be sited so as to not penetrate the take-off climb/approach surface. A boundary fence not exceeding 1.2 m in height may penetrate the transitional side surface.

Day Visual Runway

Take-off climb/approach surface

The runway should have a take-off climb and approach surface which should:

- Rise upwards and outwards from the end of the runway strip (inner edge); and
- Be obstacle free above a gradient of 1:20; and
- Extend horizontally for a distance of 1200 m from the inner edge; and
- Have sides that are splayed outwards at the rate of 1:20; and
- Not turn before 300 m from the inner edge if a turn is necessary.

If the 1:20 gradient rising from the runway strip end does not clear all obstacles, a displaced landing threshold should be marked at the position necessary to ensure that the approach surface clears the obstacles.

Transitional side surface

The runway strip should have a surface clear of obstructions extending outwards and upwards from the sides of the runway strip and the approach/take-off surfaces. The surface should be at a gradient of 1:4 till it reaches a height of 2 m above the runway strip.

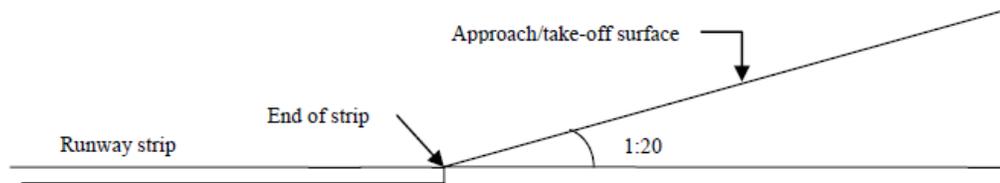
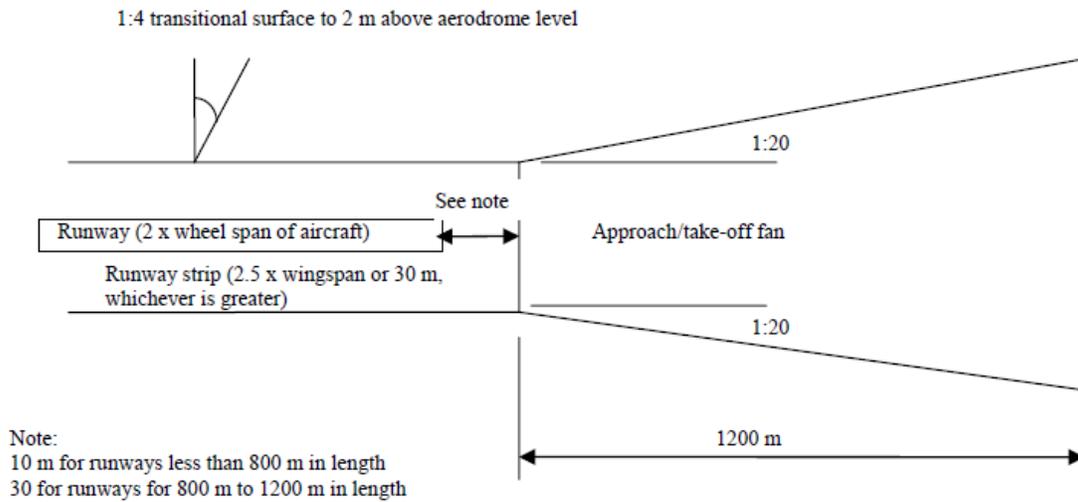


Figure 6 CAA Day Visual Runway OLS

The landing threshold is normally located at the start of a runway and indicated with the location of a windsock and a threshold marker. In determining that no obstacle penetrates above the approach surface, account should be taken of the vehicles or other mobile objects in the approach area. A height of 4.5 m should be allowed for road vehicles.

At Raglan, the vehicle parking area on the Runway 23 approach needs to be considered and, if necessary, parking in the area is restricted. If an object extends above the approach surface and it cannot be removed, the threshold should be displaced to a runway position that provides the required obstacle free approach surface.

10 Proposed Solutions

The risk assessment identified several hazards, high risk and possible controls for Raglan Aerodrome. The decision on action to take best sits with the WDC in consultation with airfield users both general public and pilots. The following section identifies some proposed solutions that may be enacted to comply with CARs and HSWA requirements.

10.1 Aerodrome Area

From the analysis of information provided, correspondence from the CAA and meetings on the airfield with WDC and locals the current situation needs to be addressed.

It is apparent that the general public and animals pose a risk to aerodrome operations and that aircraft operations pose a risk to the general public and animals using the aerodrome area. Defining the aerodrome correctly as per Section 9 including reducing the aerodrome operational area will allow more area for people and activities including dog walking.

The following options are available and recommended:

1.	Review the aerodrome size and dimensions in accordance with CAA AC139-7 including reduction in the runway width to 10 m and the runway strip width to 30 metres
2.	Undertake a full OLS survey once the aerodrome strip is established and address any obstacles as needed, including vehicle parking in the northeast carpark.
3.	Define the runway by appropriate aerodrome marker boards or similar for the runway ends, threshold (if not located at the runway ends) and the runway edge (to assist people). See Appendix E.
4.	Based on the review of the aerodrome size and dimensions including OLS, fence the perimeter of the aerodrome to prevent inadvertent access of the general public and animals.
5.	Define an aircraft parking area that is outside the OLS and fenced or barriered to prevent inadvertent access by the general public.
6.	Publish the OLS in the district plan to ensure it protects the airfield from new obstacles and people can access.
7.	Review the fuel tank on the airfield and if it remains, note its location and usage in the AIPNZ chart.
8.	Develop a process for issuing NOTAMs or closing the airfield for special events or during local activities.
9.	Develop a new training procedure for WDC staff and contractors working on the aerodrome to ensure pilots are aware and staff are protected.
10.	Determine if a specific helicopter landing area is needed.
11.	Provide aerodrome educational information for the General Public on the WDC website on Raglan Airfield.
12.	Consider a contracted Airport Manager to oversee operations – part time or on call.
13.	When fenced, erect CAA Operational Signage on all fences and access points to the airfield to identify the area as an operational aerodrome and limit access.
14.	Consider additional signage for the public warning of aircraft operations especially noise, propellers and taxiing aircraft.
15.	Require any dogs on the area around the aerodrome operating area are kept on leads or fencing prevents access to the aerodrome operational area.
16.	Develop Aerodrome Management plan including instigate regular aerodrome operational inspections on runway surface, obstacles and foreign object. Including at least one full inspection before the busy Spring/Summer traffic season.
17.	Consider ongoing approval process for operators to use the aerodrome especially training flights so that appropriate briefing information is provided to student pilots – See AIPNZ options below.
18.	If events occur on the aerodrome especially when closed, then establish a procedure to inspect the aerodrome for damage or debris before it returned to operations.

10.2 Aerodrome Operations

In regard to Aerodrome operations, it is recommended that the WDC:

1. Continues the approval process for users as per current NOTAM until sufficient actions have been enacted to address the risks to people on the aerodrome.
2. Discusses with Emergency Helicopter Operator if procedures are need for when they operate close to the aerodrome e.g., AIPNZ note to remain clear of aerodrome whilst emergency helicopter is operating.
3. Adds to the AIPNZ notes to:
 - a. Caution pilots on the changeable winds and possible turbulence on approach.
 - b. Advise on bird activity
 - c. Until fully fenced, recommend landing light to be on when aircraft on approach.

10.3 Temporarily or permanently close the Aerodrome

If the airfield was to be temporarily closed or it was decided to permanently close there are several actions that are needed.

Temporary Closure

If the airfield was to be closed on a temporary basis, then a notice to airmen (NOTAM) would need to be issued to advise pilots. A NOTAM can be issued for 90 days and if the closure is longer then an Aeronautical Information Publication Supplement would need to be issued (SUPP).

Additionally in accordance with CAA Advisory Circular AC139-7 guidance:

- Marking or markers should be displayed on the runway which is closed to the use of all aircraft.
- The marking or markers should be in the form of a white cross with the minimum dimensions as shown.
- The marking or markers should be placed at one third and two thirds the length of the closed runway.
- The windsocks could be temporarily removed.

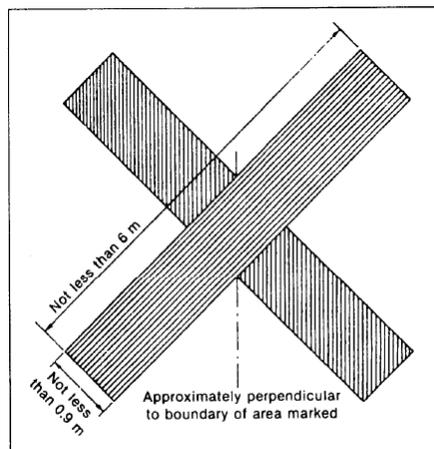


Figure 5-4. Marking for a closed runway, taxiway or portion thereof

Permanent Closure

If the airfield was to be closed, then the CAA needs to be advised under Civil Aviation Rule Part 157. This relates to an intention to deactivate, discontinue using, or abandon an aerodrome for a period of one year or more.

Civil Aviation Rule 157.7 requires notification to the Director of Civil Aviation in writing at least 30 days before the date planned for deactivation, discontinuance of use, or abandonment of an aerodrome. Then notify the Director of Civil Aviation in writing of the completion of the action within 15 days of the completion.

A planned closure plan would be required and would include the following:

- The aerodrome will need to be permanently withdrawn from the Aeronautical Information Publication (AIPNZ) which requires a 90 day notification.
- Removal of the aerodrome from the Visual Navigation Charts (VNC) that are published in November each year and cut off for changes in April in that year.
- Aerodrome infrastructure would need to be removed including runway markers, signage and windsocks.
- Closed airfield markings would need to be displayed as per above until the aerodrome is removed from the AIPNZ and possibly the VNC.
- Advice to regular users of the aerodrome and also on the WDC website.

11 Draft Aerodrome Report – Consultation

The draft Review of Raglan Aerodrome Report was provided to the WDC then to Raglan Community Board at the end of August 2021. A review of the responses noted:

Response	Comment
Two responders responded regarding land ownership.	Out of scope of the airfield operational and safety assessment.
One aviation responder agreed that people and animals on an active aerodrome are a very significant hazard at Raglan. They support measures to separate planes and people at the Aerodrome. They do not support the proposal to reduce the width of the runway to 30m. They also provided some information on operational areas to consider.	The runway width should be adequate for the proposed operations. A comment on markers boards – for the sides of the runway a low marker board can be used or a concrete insert to mark the runway edge.
Several responders asked about a risk assessment and other options rather than fencing.	This has been included in the report sections 8.3 and 7.3 respectively.
One responder noted the scope of the report is narrowly focussed on the occurrences and risks on the airfield.	The other occurrences are not related to the airfield safety or operations as detailed in Section 6.3.1
One responder noted the occurrence reports were low.	Pilot and the general public reporting to CAA can be low and the reported occurrences probably do not reflect all occurrences at the airfield.
Some responders noted the costs for improvements.	This is an issue for the WDC and the community to discuss.
Several responders commented on narrowing the runway would increase the risk of turbulence and windshear causing a plane to hit the new fence.	The wind and turbulence are on the approach areas and normally result in the aircraft being too low or too high rather than being not lined up to the runway centreline. The proposed runway size would be much greater than is needed for the aircraft types that operate and includes a “runway strip” that is for aircraft lateral movement protection on landing.

12 Summary

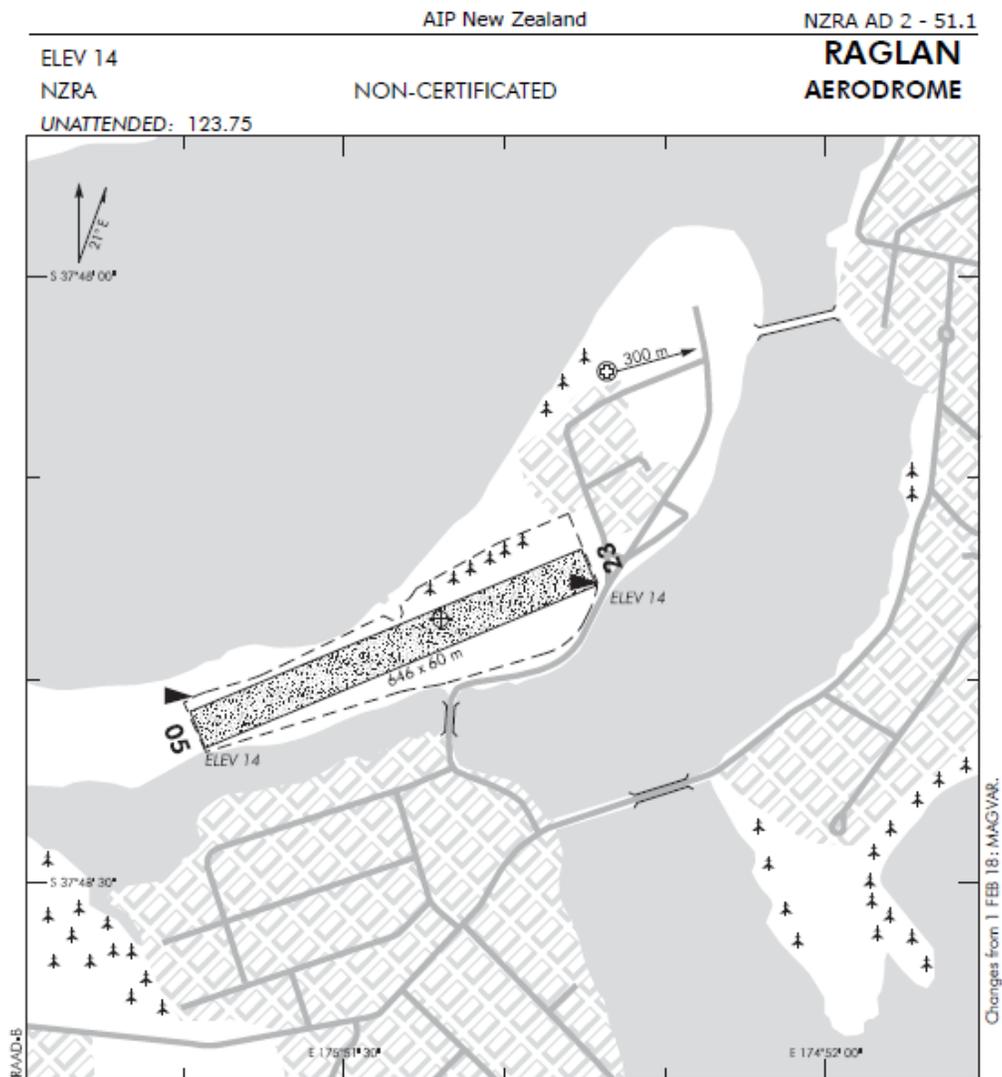
Raglan Aerodrome is a general aviation aerodrome that has a range of aircraft operations with the most operations in the summer period. Although the aerodrome has been established for a number of years the aerodrome operation is on land that is used for beach access, walking and dog walking. The general public have unrestricted access to the aerodrome and the operational areas whilst aircraft are operating.

Whilst aircraft operational numbers are not high the risk of an incident between a landing aircraft and a person or dog on the runway is high. Whilst signage warns pedestrians and the AIPNZ has a note for pilots the situation presents significant safety issues and WDC needs to take action as both aerodrome operator and a PCBU under appropriate legislation.

Upon assessing the aerodrome, a solution can be provided that ensure the safety of people on the ground and pilots operating at the airfield. If the aerodrome is properly designated with associated obstacle surfaces, and the operational area is sufficiently fenced, it may leave a suitable area for the general public to enjoy. Defining the limits of the operational aerodrome will also mean that members of the public will have a greater awareness of where aircraft will be operating and can remain clear.

There are also some aerodrome management activities that can be undertaken to ensure WDC operates the Aerodrome in accordance with regulatory requirements.

Appendix A – Raglan AIPNZ Chart



1. **CAUTION:**
 - Rabbit holes on aerodrome.
 - Norfolk Island pine on hill infringes fan to NE. 10° left turn required on take-off.
 - Emergency helicopter operations take place from harbourside site approximately 500 m east of THR RWY 23.
 - Occasional dog walking (off leads) who run freely on the runway.
 - People walking across runway from time to time.
2. First aid kit at fire/ambulance station.
3. Card phone available at camp 50 m NE of aerodrome.
4. Kite flying occurs at Wainui reserve 2 NM SW of aerodrome.

S 37 48 17 E 174 51 36*

Effective: 22 APR 21

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RAGLAN AERODROME

NZRA AD 2 - 52.1

AIP New Zealand

Non-Certificated Aerodrome 0.6 NM WSW of Raglan

**RAGLAN
OPERATIONAL DATA**

NZRA

RWY

RWY	SFC	Strength	Gp	Slope	ASDA	Take-off distance			LDG DIST
						1:20	1:30	1:40	
05 23	Gr(f)	ESWL 1020	5	Nil		646			646

LIGHTING

Nil

FACILITIES

Nil

SUPPLEMENTARY

Operator: Waikato District Council, Private Bag 544, Ngaruawahia.
Tel (07) 824 8633 Fax (07) 824 8091

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**RAGLAN
OPERATIONAL DATA**

Appendix B – Raglan Aerodrome Review Scope



Raglan Airfield Review

Background:

Raglan airfield is a small local airfield located on the west coast between Auckland and New Plymouth and West of Hamilton. The airfield is situated on land administered by the Waikato District Council in the centre of Raglan township. The residential and commercial centres of Raglan are located to the south and east of the airfield.



Image 1: Raglan Airfield Location

The airfield is operated by the Waikato District Council's Open Spaces team from a maintenance and administration perspective. The Raglan airfield is non-certificated.

Recently Council presented a report to the Raglan Community Board with some proposed changes to the way in which the airfield was managed. These changes were recommended to better control the health and safety risks associated with an operational airfield, for both pilots and members of the public.

These risk controls have been challenged by the community and therefore we are seeking an independent assessment the health and safety risks associated with the airfield, and a review of appropriateness of the controls that are currently in place to manage these risks.

Purpose:

The purpose of the proposed review is to assist in the following areas:

- Council has no staff that are subject matter experts in the management of non-certificated airfields/aerodromes. A review of the airfield's health and safety risk management practices would assist staff in their understanding of what is required to safely operate an airfield.



Raglan Airfield Review

- Waikato District Council is looking to understand the health and safety risks with the existing airfield use and layout and how these risks can be eliminated or managed as far as is reasonably practicable as required by Health and Safety at Work Act (2015) and its associated Regulations.

It is intended that the review of the operations and risks would then be shared with the Raglan Community Board / Community to assist in the discussion around the use and management of the airfield.

Project Outcomes:

The outcomes Council is seeking from this work would be to:

- Provide subject matter expert advice on the management of risks in accordance with Council's duties detailed in the Health and Safety at Work Act (2015)
- Independently audit the health and safety risk management of the airfield.
- Identify specific risk controls, the cost to implement, and the impact that these controls would have on managing the risk.
- Present the information in a report.

Scope:

- Review the management of the Raglan Airfield from an airfield operator's perspective.
- The review is limited to Raglan airfield as highlighted on the map above.

Deliverables:

- A detailed report that summarises key findings, recommended changes or improvements and the legislation and/or evidence which supports these recommendations.

Client Information provided:

- Historic use data
- CAA incident reports
- CAA notice

Community Queries

The community have raised some of the following queries and concerns. Can comment be made on the validity of the ideas and queries so WDC and the Raglan Community Board can discuss the outcome.

- Concerns about the airfield's proximity to the urban areas of Raglan and the possibility of aircraft incident.
- Pedestrian warning light system
- What is the actual safety risk associated with pedestrians and aircraft? Can it not be managed similar to train crossings?
- Can the airfield be split use? I.e., Some days are designated for community use and vice versa.

Appendix C – Aerodrome Inspection Photos

Approach RWY 23 from runway edge



Approach RWY 23



Approach RWY 05



Centre of RWY 23 Approach



Beach Access - No Signage



Beach RWY 23 Approach



Beach RWY 05 Approach



Signage Aerodrome access from beach



Signage Southeast Road



Aerodrome Marking Lines



Trees northwest side



Signage Car Park by Motor Camp



Fuel Tank Location



Fuel tank



Parking Area



Windsock RWY 23



Windsock RWY 05



Appendix D – CAA Article on Raglan

The Right Approach to Raglan

Don't get high on a visual illusion and sink to a bumpy landing.

Sometimes in here, the weather's great and the sea's up. With a 10-knot headwind you're established on final approach in your light aircraft for Runway 23 at Raglan, for a weekend of fun at the beach. What could be better?

For the unwary or low time pilot however, Raglan aerodrome can present some interesting challenges because of the runway length and some visual illusions, especially landing to the west on Runway 23.

Recently ZK-ZFR, an ATEC Zephyr, was on a short approach to land on Runway 23 at Raglan when it started to sink. The aircraft stalled heavily and its landing gear collapsed. Fortunately, nobody was injured, but it was a bad ending to an otherwise uneventful flight.

Be Aware

Raglan aerodrome with an elevation of 14 feet, by the beach, has two grass Runways, 06 and 23, with no slope and 544 metres distance for landing and takeoff.

Flying instructor and A320 pilot, Bill Hemwood, has seen some interesting landings, or rather arrivals, at Raglan.

"I think for any pilot approaching Runway 23 at Raglan, it can be a challenge with some unique features, especially for the low-hour infrequent-flying private pilot.

"On final for 23, the view of the hills at the western end may cause pilots to think they have less room than they have.

"The wind can also be fickle, and a wind from any direction other than straight down the runway tends to bend, and come from the harbour entrance at the western end, but then be straightened by the trees on the northern side of the threshold. A wind from the northwest will tend to blow a 230 direction at windsock height, but will behave as a north westerly at treetop height, giving a change of direction and wind shear just as you are crossing the fence," Bill says.

Test Pilot Roger Shepherd says that he has observed some very slow and low approaches across the 23 threshold and boundary fence, and some interesting arrivals.

"My discussions with other pilots revealed that they had noted similar observations to mine," Roger says.

Roger offers some additional thoughts to those of Bill as to what he considers may be contributing factors to the formation of visual illusions that fool pilots into believing they are higher than normal on the approach, and the resulting low, slow approaches and heavy landings.

"The actual strip is not delineated by a brown area as is often the case at other airfields, which means it may not present similar visual cues that other strips normally do.

"The higher terrain of Bow Street at 75 feet, positioned approximately 500 metres from the boundary fence on the extended centre line, and two Norfolk pine trees approximately 320 metres from the boundary fence, may cause pilots to add a little more height to their approach, to subconsciously give themselves plenty of obstacle height over the houses and trees.

"Sadly, at 640 metres in length, Raglan may represent a short strip to many pilots.

"With amateur-built aircraft, the stall speed may not have been accurately established and may be higher than what people believe and use."

A Typical Scenario

Roger offers the following scenario as a likely plausible explanation for the consequential heavy arrivals off the 23 approach over Bow Street and the pine trees.

"A pilot sets up for a normal landing approach, but from about mid-way down final approach the rising terrain of Bow Street starts to look a little imposing, and the two pine trees become apparent. An increment of power is added, and the subsequent subtle nose pitch up and airspeed decrease is not appreciated.

"Inside one mile on final, the pines begin to look quite high and a little more power and possibly another slight attitude change is made to miss the trees by a healthy margin.

"Crossing over the pines, the approach looks a bit higher than normal, and an impression may be gained that the aircraft will have insufficient distance to stop.

"After passing the trees a considerable power reduction is made to get down to what is considered a normal approach height. Watching aircraft at this point it would seem that the increasing sink rate is not being appreciated, and power is heard to be added with a significant nose up pitch.

"The boundary fence slips by underneath, the power is cut and the aircraft arrives."

Roger says that if we consider a typical day with at least 10 knots of wind, and a low-inertia aircraft, then the glide

angle after passing the pine trees can be quite steep and crucially short of the strip.

Tips for Safe Arrivals

"After passing Bow Street and the pines, any power reduction should only be very slight and the aircraft can be placed easily at around a third of the way into the strip with 430 metres left to go – ample for the type of aircraft that seem to feature in these observations," Roger suggests.

Bill offers some additional tips for safe arrivals.

"Know exactly the distance your aircraft requires to land in, not just the ground bit – the whole lot. Slamming the aircraft onto the ground just inside the threshold and boundary fence is pointless and potentially dangerous, if every time you do so you have more than 400 metres of runway left over.

"For amateur-built aircraft, know your actual stall speed at maximum landing weight in the landing configuration. The actual speed your aircraft stalls at could easily be around 30 per cent greater than what you see indicated on the airspeed indicator.

"Know what 1.3 times the stalling speed in the landing configuration (V_{LS}) means, and work it out for your aircraft. Practise and become confident at flying stable approaches at $1.3 V_{LS}$.

"Be aware of the trees on the right of the touchdown area of Runway 23, and the wind shear they create.

"Be aware of the undulations to the left of the nominal 23 centreline."

"Seek professional help if you are in doubt, or if you need to boost your skill levels and confidence before operating at Raglan," Roger adds. ■

Photo courtesy of Roger Shepherd



Appendix E – Aerodrome Markers

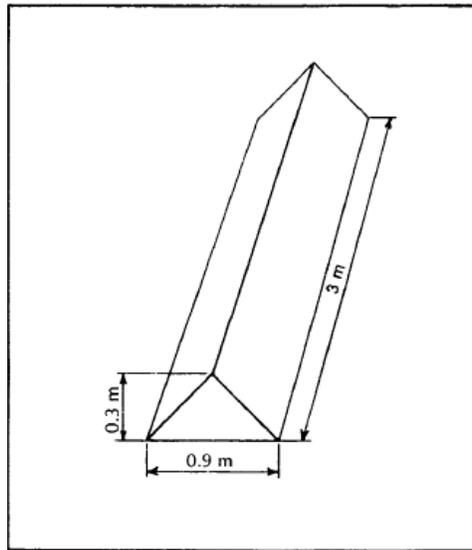
CAA Advisory Circular AC 139-7

Markers for general use

5.2.7 Markers should be lightweight and frangibly mounted. Those located near a movement area should be sufficiently low to preserve clearance for propellers. They may be boards, cones, or white painted tyres.

5.2.8 A conventional marker board should be constructed to appear as illustrated in Fig. 5-3.

Figure 5.3



Moulded plastic markers filled with water - <https://flightgse.com/product-lines/airfield-markers/>

