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Alford Park Limited
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**Irricon Resource Solutions
Alford Park
RD1
Ashburton
Attention: Keri Johnston**

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The consultant is to be the main point of contact for this application.

Ashburton Staveley Road, Ashburton Forks
Legal Description: Lot 1DP 76388
Map Reference: K36: 9054-2195

1. To take water from Taylors Stream (B Permit).
2. To dam and use water for irrigation purposes.

Signed: 

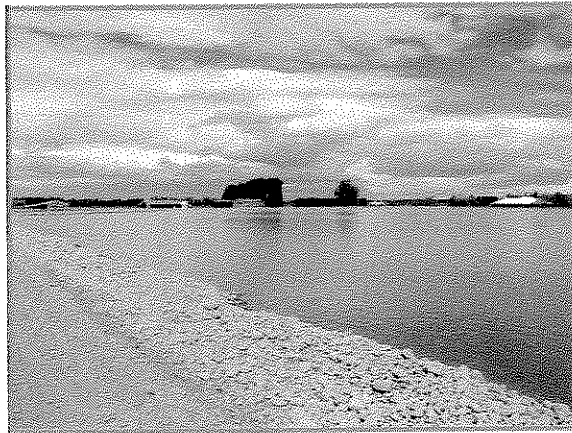
18/1/08 on behalf of the applicant

Application fee of \$2250.00 has been paid by direct credit on 18/1/08. Reference: Alford Park

EC - CHCH		
FILE REF: C06C-23205		
DOCUMENT No.	ACTION	INFO
C08C-14534		
21 JAN 2008		
E. Davidson		



APPLICATION FOR RESOURCE CONSENT



Applicant: Alford Park Limited
Activity: (1) To harvest water from Taylors Stream
(2) To dam and use water from a storage pond

This report has been prepared for Environment Canterbury as the regulatory authority for the proposed activities in accordance with Section 88 of the Resource Management Act 1991 by Keri Johnston of Irricon Resource Solutions on behalf of the applicant.

I am a professional member of the Institute of Professional Engineers NZ (MIPENZ) and a chartered professional engineer (CPEng).

1.0 INTRODUCTION

The applicant is proposing to irrigate 672 hectares of pasture. 500ha of this is currently irrigated by predominantly border dyke irrigation using CRC950927.1. This allows 1000 litres per second to be taken from two intakes.

However, CRC950930.2 is subject to Ashburton River minimum flow restrictions, and volume cap of 582, 630 cubic metres in any consecutive 31 day period.

It is proposed to obtain B permit water in order to take more than the monthly cap specified on CRC950930.2 when flows allow, and build storage to buffer times of restriction. The dam will become the central point for irrigating the property.

The PNRRP specifies B permits for the Ashburton River and its tributaries at 14, 000 L/s with no allocation limit. It is proposed to apply for this band of water, but in consultation with Fish and Game for previous applications, trigger levels for Taylors Stream have also been proposed.

The pond is in the process of being designed. The initial design has a maximum water depth of 2 metres and embankment height of 2.5 metres. However, this is only 270, 000 cubic metres of storage. There is more area that can be used for storage, and this is being incorporated into the final design, however, if the storage is still less than 300, 000 cubic metres, the embankment height may be reduced. This will then trigger the building act. If this occurs, a building consent will be obtained.

2.0 DESCRIPTION OF THE PROPOSAL

It is proposed to carry out the activities under the following conditions:

Take Water

1. Water shall be diverted from Taylors Stream at Intake "A" at or about map reference NZMS 260 K36: 9027-2209.
2. Water shall be diverted and taken at a maximum rate of 500 litres per second.
3. The taking of water in terms of condition <1> shall only occur when flows in the Ashburton River as measured at SH1 are at or above 14, 000 litres per second AND when flows in Taylor's Stream as measured immediately above the confluence with the South Branch of the Ashburton River are at or above 3, 000 litres per second.
4. Water shall only be diverted in storage pond consented under CRCXXXXX¹ or any subsequent consent.
5. The Canterbury Regional Council may, once per year, on any of the last five working days of May or November, serve notice of its intention to review the conditions of this consent for the purposes of dealing with any adverse effect on the environment which may occur.
6. The lapsing date for the purposes of section 125 shall be 31 December 2011.
7. A 10 year duration is requested.

¹ The storage consent being sought.

Dam and Use Water

8. The dam is located on the land parcel Lot 1 DP 76388, at or about map reference K36: 9054-2195
9. The volume of water dammed shall not exceed 300, 000 cubic metres.
10. Water stored in the dam shall be that taken under CRC950930.2 and CRCYYYYY.²
11. The depth of water in the dam shall not exceed 4.5 metres.
12. The height of the dam shall not exceed 5 metres above ground level.
13. The pond must:
 - (a) Have rip rap around the entire inside perimeter of the pond, from the crest to the floor.
 - (b) The crest and outside banks must maintain a good, even grass cover.
14. Prior to the commencement of construction a copy of this resource consent shall be given to every person involved in the construction.
15. A construction report shall be prepared by the person responsible for the design and construction of the dam, and a copy of which shall be provided to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within one month of the construction of the dam.
16. Upon completion of the dam, and before first filling, the person responsible for the design and construction of the dam shall certify the dam as safe and ready for operation. A copy of the certification document shall be forwarded to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager.
17.
 - (a) The person responsible for the design and construction of the dam shall be present during first filling and shall record any faults observed.
 - (b) The consent holder shall immediately remedy any faults recorded during first filling.
 - (c) A report shall be prepared detailing any faults observed and the remedial action taken, a copy of which shall be provided to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within one month of first filling.
18.
 - (a) The consent holder shall ensure that a chartered professional engineer inspects the dam within five days of first filling.
 - (b) The chartered professional engineer shall record any faults or findings that could potentially lead to dam failure, and recommend the appropriate remedial works. A report of these findings and recommended remedial actions shall be prepared and a copy of which shall be provided to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within one month of the inspection.
 - (c) The consent holder shall immediately undertake any remedial works or corrective action recommended by the engineer and notify the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within one week of completion.
18.
 - (a) The consent holder shall undertake routine inspections and maintenance works on the dam.

² The consent number given to the application to take B permit water.

- (b) The details and findings of any inspections and maintenance works shall be recorded in a logbook kept for that purpose. A copy of the logbook shall be forwarded to Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, once per year.

19.

In the event of any evidence of erosion, seepage, cracking, settlement, slipping or other embankment deformation the consent holder shall, immediately:

- (a) report the event to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager; and
 - (b) consult a chartered professional engineer who shall be requested to take responsibility for:
 - (i) The inspection of the dam;
 - (ii) The identification of remedial action required;
 - (iii) The recording of the details of the inspection, reasons for the fault and remedial action required, in a report, a copy of which shall be forwarded to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager within one month of the inspection.
 - (c) undertake any remedial works or corrective action recommended by the engineer, and notify the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within one week of completion.
20. In the event of dam failure, the consent holder shall immediately contact a chartered professional engineer who shall complete a report detailing the cause of failure and the action taken. A copy of this report shall be forwarded to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within one month of the event.
21. The consent holder shall ensure that the dam is inspected comprehensively by, or under the supervision of, a chartered professional engineer, at least once every five years after that. A copy of the inspection report shall be forwarded to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, within one month of the inspection.
22. Water from the dam will be used for the irrigation of crops and pasture, as shown on the attached plan "Alford Park Limited".
23. Water from the dam will be taken at a rate of 467 litres per second, with a volume not exceeding 40, 320 cubic metres per day.
24. The Canterbury Regional Council may, once per year, on any of the last five working days of May or November, serve notice of its intention to review the conditions of this consent for the purposes of dealing with any adverse effect on the environment which may occur.
25. Lapsing date.
26. An expiry date of 26 September 2030 is requested to coincide with the expiry of water permit CRC950930.2.

3.0 CONSULTATION

No consultation has been undertaken as no persons are considered to be adversely affected by the proposed take.

4.0 DESCRIPTION OF THE ENVIRONMENT

Taylors Stream is a tributary of the Ashburton River.

The pond is sited entirely within the applicant's property, which is located on Ashburton Staveley Road. The pond will be visible from the road.

The nearest dwelling (excluding the applicant's) is located over 1km away on the other side of Taylors Stream.

The land is flat! There are no other topographical features.

The highest groundwater level within 2km of the dam site is -0.19m. (This was recorded in well K36/0473, 12.34m in depth). BMW Contracting Limited has been on site and test pits dug to ascertain the water level. The highest water level in the dam site is -1.3m.

Taylors Stream runs adjacent to the property. There are also a number of springs on the property (as shown on ECan's online GIS). None of the springs are located in the dam footprint.

The dam will have the following dimensions:

Inside batters	4:1
Outside batters	3:1
Crest width	3m

The dam will be constructed using a mixture of clay silt and gravel, and will be compacted properly. Topsoil was removed to ensure a good bond between the foundation and the structure.

The dam will be filled under gravity from a race. Water will be supplied to the pond using a spillway inflow, which will be concreted to ensure that erosion does not occur.

Rip Rap will be placed around the entire inside of the dam and the crest and downstream batters will be grassed.

It is very unlikely that the dams will be overfilled as the filling of the dams is via manual operation, rather than rainfall.

If, in the unlikely event, it is overfilled, water would be pumped out the dam and used.

5.0 ASSESSMENT OF ACTUAL AND POTENTIAL EFFECTS

The following effects are considered relevant to the proposed activity.

5.1 Effects of take on other water users

When water is abstracted from a river system, the reliability of the water resource to downstream users of that resource can be compromised. What this means is that downstream water permit holders could be restricted via minimum flows more often than in the past. It also may mean that the reliability of the water resource as a source of stock drinking water or domestic water is reduced.

The PNRRP specifies a B permit trigger level of 14, 000 L/s, with no allocation limit. There are three other consented B permit users on the Ashburton River system at this time, with three currently in process, totalling 1341 litres per second.³

A harvesting trigger is also proposed for Taylors Stream ensuring that the tributary itself is also in "high" flow, and that existing users on the tributaries are not affected. This is 3, 000 litres per second immediately upstream of the confluence with the South Branch of the Ashburton River. These triggers were determined with Fish and Game and Mr Graeme Horrell, Surface Water Scientist for Environment Canterbury.

³ Alford Forest Dairies – 200 L/s; Tayler Smith Holdings – 200 L/s; GA Lowe – 341 L/s; C & D Shannon – 200 L/s; Westward Ho – 200 L/s; GA Lowe – an additional 200 L/s.

One of the consents already granted is also on Taylors Stream (Tayler Smith Holdings) but this is located over 5km upstream of this take, and therefore, and at high flows, this take will not interfere with their ability to abstract water.

Therefore, the effects on other users are minor.

5.2 Cumulative effect of take

As water will only be taken during times of high flow, the applicant considers the cumulative effect of the take will be de minimus.

However, it is noted that Fish and Game as part of their submission on the PNRRP stated that the B permits should be capped. Fish and Game proposed a cap for A and B permits of 60% of the natural mean of the Ashburton River, which is 14, 300 litres per second. The PNRRP allocates 11, 800 litres per second to A permit water, which is considered to be fully allocated. This leaves 2, 500 litres per second to B permits.

As stated earlier in this report, there is currently 1341 litres per second either consented or in process for B permit water. This application is for a further 500 litres per second bringing the total up to 1, 841 litres per second, within the limits of the proposed cap. This leaves a further 659 L/s available.

Given this, cumulative effects are considered to be minor.

5.3 Effect of taking water on aquatic ecosystems

When water is abstracted from a river system, there is always the possibility that the abstraction may have a significant adverse effect on the aquatic species present in the river. These effects could be as follows:

- Higher water temperatures.
- Lower oxygen levels.
- Less access to riparian margins for breeding.
- Impeding fish passage through lower water levels within the river.
- Reducing fish habitat.

There are currently two methods used to mitigate these effects. One way is by setting a minimum flow for the whole river system, usually at the bottom of the catchment. The other way is by using a residual flow below the abstraction point.

In this case, a maximum flow has been set! Given that water will only be taken during times of high flows, it will not impact on aquatic ecosystems.

5.4 Effect of take on amenity values

When water is abstracted from a river system, the volume of water contained within the river system downstream of the abstraction point is reduced. This can cause less water to be available to the recreational users of the river. This can also lead more of the riverbed being exposed, and for longer periods of time. This can impact on the natural character and amenity values of the river.

Water will be abstracted during times of high flow, and therefore, the take will not cause the river to look "low".

Given this, effects on amenity values are minor.

5.5 Effects of dam failure

When a dam fails, a large wave of water flows downstream. This sudden rise in water levels can mean that people downstream of the failed dam can experience a loss of property, stock, and even life. Also, the ecosystem downstream of the dam can be significantly damaged.

Any dam failure could result in damage to pasture, fences, localised scour, sediment deposition, and routed flood-wave through the applicant's property.

Under NZSOLD guidelines, the dam is considered to be in the **low** risk category. This means that the risk to life is low, with minimal damage (environmental and economic) possible as a consequence of failure. The likelihood of loss of life is considered exceedingly small given the rural nature of the site, and the size of the dam.

For a full breach to develop, this would take 2 to 4 hours as has been shown in a number of case studies (average time of 2 hours 20 minutes based on work done by Stephen E Coleman, Darryl P Andrews and M. Grant Webby in the Journal of Hydraulic Engineering, Sept 2002 entitled Overtopping breaching of nonconhesive homogenous embankments), giving them time to draw the reservoir down via pumping to minimise the effects.

Robin Fell at the ANCOLD conference entitled Dams: the implications of ownership in 2002 did a survey of 14, 700 dam failures on large dams (>15m high) and found that only 0.83% of all embankment dams failed. This is pretty small! And these dams are only 13% of the height!

The most likely causes of a dam failure for a pond of this type are piping (internal erosion) or overtopping causing a breach. These are easily mitigated! Piping is easily identified through monitoring of seepage through the embankment, and overtopping is just about impossible in a dam with no catchment – you shut the inflow off, and pump out!

Robert Goldie of RJ Hall has done some general calculations. For an 80, 000 m³ paddock pond, time to affect the breach was 6 minutes, lasting 15 – 20 minutes. Peak flow was 100 m³/s with a 10m breach width. This resulted in velocity of 2 m/s at 300m from the dam, and a water depth of 200mm. He also showed that by 300m, as a result of the downstream surface being "rough" (i.e grass as opposed to concrete), the flow was well and truly sub critical!

With respect to overtopping, the effects are nil unless it affects a breach. For overtopping to affect a breach, there would need to be a "dent" in the downstream slope and water would need to be concentrated at this point for a long period of time to erode enough material for it to fail. Time wise, this is at least a week and the likelihood of a paddock pond being overfilled for a week is nil!

There are no dwellings within 1000m of the pond site.

Given the proposed mitigation (as detailed in section two of this report), the applicant considers that any adverse effects of dam failure will be minor.

5.6 Other Potential Effects

With the damming of water, other effects are also considered. These are:

1. Effects on ecological values;
2. Effects on groundwater quality and quantity;
3. Effects on amenity values;
4. Effects on surface water.

As the pond is "out of stream", and the water is sourced from an irrigation scheme, the effects on ecological effects is irrelevant to this consent.

In this case, the groundwater is shallow and therefore the pond will be built entirely above ground to ensure that the dam will not intercept groundwater. Given that the pond is filled by river water, groundwater quality from seepage through the base of the dam will not be affected.

Amenity values will not be altered by the pond. It is entirely within the applicant's property and the bund will be grassed to "blend in" with the natural rural environment. Given this, I believe that effects on amenity values are minor.

The pond is situated by Taylors Stream, and in the event of a dam failure, water would enter Taylors Stream. However, this would have the effect of a small fresh and would not impact on the surface water body in any way. The physical structure of the dam is at least 10m from the active edge of Taylors Stream, and therefore will not interfere with the natural river.

There are springs on the property, but none of these are in the dam footprint, and therefore, will not be affected.

5.7 Effect of take and use on tangata whenua values

The site of the proposed abstraction is within the rohe of Arowhenua Runanga. The applicant considers the effects of the proposed take on tangata whenua values may be less than minor given that the application is for storage and harvesting, which Runanga are in support of.

5.8 Effect of the use of water

The use of water when applied to soil for irrigation purposes can, depending on the type of landuse, the intensity of the landuse and the inputs of contaminants to the soil from the landuse, degrade water quality. This degradation of water quality may have adverse effects on other groundwater users and as a consequence of groundwater contamination, on surface water resources.

The existing landuse is dairy grazing, and has been for three years. This is an intensively farmed property that is predominantly border dyke irrigation.

The land will be irrigated using spray irrigation, with some border dyke remaining. This is considered to be an efficient form of irrigation and also reduces the possibility of leaching, and as the land use is not changing, a significant increase in the level of contaminants entering groundwater is not expected. A swing to predominantly spray irrigation is an improvement on the status quo.

The taking of water in excess of that required for the intended use may contribute to water levels being unnecessarily reduced. This lowering may have adverse effects on other groundwater users; particularly where water availability is an issue. In addition, it may result in elevated water levels down gradient of the area being irrigated, which may in turn cause a reduction in productivity and possibly surface flooding.

The applicant is proposing to spray irrigate 672 hectares of pasture on a three day rotation. The soil over the property is a mixture. Approximately 76ha is a medium soil (Mayfield Shallow Silt Loam, AWHC = 95mm), 38ha is heavy soil (Taitapu Deep Silt Loam, AWHC = 150mm), with the remainder being considered light soils (Hororata, Rangitata, Mayfield and Waimakariri Stoney Silt Loams, AWHC = 25mm-65mm). With the majority of the property being light soils, a gross target application depth of 6mm/ha/day is proposed. This requires a rate of 467/s to be taken from the dam. The maximum gross depth applied will be between approximately 18 millimetres gross per 3 day return period (or 14.4mm with 80% efficiency). This is an efficient use of water and satisfies the 50% AWHC criteria.

6.0 SUMMARY

The applicant requests that the application to take, dam and use water proceed non-notified pursuant to s.94 given that:

- The assessment of environmental effects being minor;

- That no persons are likely to be adversely affected by this activity;
- The activity being consistent with the objectives and policy's in the Regional Policy Statement, and Part II of the Resource Management Act,

And are granted with the requested duration.

APPENDIX ONE -- MAP

APPENDIX TWO - SCHEDULE WQN9 CALCULATION

([UPDATE DETAILS](#)) ([NEW SEARCH](#) | [PREVIOUS SEARCH](#))

([COMPANY DETAILS](#) | [FORMER DIRECTORS](#) | [CHARGES - PPSR](#) | [HISTORIC ADDRESSES](#))

Company Number	1577105	View Certificate Of Incorporation
Company	ALFORD PARK LIMITED	(EMAIL CERTIFICATE)
Incorporated	15-NOV-2004	View Online Extract
Current Status	REGISTERED	(EMAIL EXTRACT)
Entity Type	Company	
Constitution Filed	Yes	
Annual Return Filing Month	May	

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Previous Names

No Previous Names on record

Address Details

Registered Office

Hubbard Churcher & Co
Chartered Accountants
39 George Street
Timaru

Address for Service

Hubbard Churcher & Co
Chartered Accountants
39 George Street
Timaru

Directors

Name	Date Appointed:
ARMER, Colin Charles 13C Ocean Beach Rd, Mount Maunganui	15-NOV-2004
HUBBARD, Allan James 6 Morgans Road, Timaru	15-NOV-2004
PYE, Alan John B Block Flat 7, Level 4, 78 Park Tce, Christchurch	15-NOV-2004

Share Parcels

Total Number of shares	3,000	
Number of Shares	1,000	
Shareholder(s)	1234958 - LIVESTOCK HOLDINGS LIMITED	Hubbard Churcher & Co, Chartered Accountants, 39 George Street, Timaru
Number of Shares	1,000	
Shareholder(s)	1234958 - LIVESTOCK HOLDINGS LIMITED	Hubbard Churcher & Co, Chartered Accountants, 39 George Street, Timaru