

MAHINERANGI WIND FARM PROPOSAL: SOCIAL IMPACT ASSESSMENT

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1 INTRODUCTION

1.1 Purpose

The purpose of this document is to report on the findings of the Social Impact Assessment (SIA) carried out by Taylor Baines and Associates on TrustPower Ltd's (TrustPower) proposed Mahinerangi Wind Farm. The SIA is one of a number of studies commissioned by TrustPower Ltd.

1.2 Objectives of the SIA

The objectives of the SIA are to assess the nature, magnitude and significance of positive and adverse social effects likely to be experienced by various communities that have an interest in the proposed wind farm; to engage the community in this assessment process, and to recommend to TrustPower Ltd appropriate mitigation measures where the potential for adverse effects is identified or where there is a benefit to the community in ensuring the achievement of expected positive effects.

1.3 Statutory framework for the SIA

The Resource Management Act 1991 (RMA) sets out a statutory framework which aims to direct the assessment of whether the proposed project would promote the sustainable management of resources in a way or at a rate that enables people and communities to provide for their social, cultural and economic well being as provided for in section 5 of the Act. The requirement in the Act is to consider the potential effects on people and communities. Thus a social impact assessment is not focussed just at the community level. Generally, SIA is defined¹ as considering effects on individuals, households, groups, sectors of society as well as communities.

Carrying out a social impact assessment within this statutory framework requires attention to a conceptual framework for thinking about social well being, and what are the factors which might contribute to people's experience of social well being. Such a conceptual framework, which has been adopted in a range of other SIA² and social research contexts in New Zealand in recent years comes from social indicators work in the OECD³ and closely parallels the framework adopted by the Ministry of Social Development⁴. The OECD study identified key areas of social life which shape well being:

¹ Burdge, R.J. 2004. The Concepts, Process and Methods of Social Impact Assessment. Social Ecology Press, Middleton, Wisconsin. 2004. p3.

² e.g. Assessment of the effects of project Aqua on local communities and development of community mitigation proposals, for Kurow Aqua Liaison Committee, 2003; SIAs carried out by Taylor Baines & Associates on several wind farm proposals in 2005 and on the Wairau Valley HEPS in 2005; social analyses carried out by Taylor Baines & Associates for assessing the social implications of commercial retail strategy development in Christchurch City between 2003 and 2005.

³ OECD, 1998. Living Conditions in OECD Countries: a compendium of social indicators. OECD Social Policy Studies No.5. Paris.

⁴ e.g. Ministry of Social Development, 2003. The Social Report 2003: Indicators of social well being in New Zealand. Wellington.

- physical and mental health;
- housing, shelter, neighbourhood and living place;
- formal education and lifelong learning;
- income, employment and the quality of working life;
- leisure and recreation, time to enjoy them, and access to quality outdoors/open space;
- public facilities, transport, communications, and access to goods and services;
- quality of the physical environment, a clean environment with aesthetic appeal;
- family life, social attachment, social contact, interaction and support;
- participation in community and society, including participation in organised groups and social activities; and
- personal safety, public safety, autonomy or freedom from too much risk.

In conducting this SIA, consideration was given to whether or not the proposed project is likely to have consequential effects on any of these areas of social life, and for which communities of interest this is most likely to be the case.

1.4 SIA approach

An issues-focussed approach was adopted, in which the assessment focussed particularly on those actual and potential effects and issues which are most critical from the perspective of the stakeholders involved, rather than being encyclopaedic and merely descriptive in nature.

The approach adopted was also staged, with an initial site visit in December 2005, a Scoping visit to gather community profile information and scope likely issues in February 2006, and a main assessment visit by two researchers in September 2006 to carry out the bulk of the interviews.

At the time of the main social impact assessment interview work in September 2006, TrustPowers' Mahinerangi Wind Farm proposal had been public knowledge for some nine months. During that time, TrustPower personnel had conducted their own consultation activities (described in the AEE documentation) including two Open Days⁵ and a number of individual property visits. The original application for resource consents were lodged with ORC, CDC and DCC in June 2006.

The decision to amend the proposal and application was announced publicly after the SIA interviews had been carried out. While the scale of some effects is likely to be affected by the changes which TrustPower have since announced to their project design, the range of social effects and issues is unlikely to alter.

⁵ The first Open Day was held in Outram on 23 February 2006, at which photomontage information based on North Island wind farms was displayed, as well as preliminary technical information made available. The second Open Day was held in Dunedin on 28 March 2006, at which photo-simulations specific to the Mahinerangi Wind Farm proposal were displayed.

SIA draws on a variety of information sources, including the detailed knowledge of many people living in the affected communities. This primary source⁶ of data is supplemented with other secondary sources⁷.

An important source of secondary data for SIA are the assessments made by other consultants investigating this proposal. In this regard, SIA complements other technical assessments, interpreting them in the social context and in the framework of social analysis described in Section 1.3. Of particular interest in this case are the visual assessment, the noise assessment, the traffic assessment and the economic assessment. There is some potential overlap with the economic assessment which has examined the potential effects in terms of benefits associated with electricity supply⁸ to consumers in the Dunedin-based reticulation area as well as direct, indirect and induced employment from construction activities, and to a lesser extent operational and maintenance activities⁹. This SIA interprets these regional benefits in terms of the numbers of people likely to experience gains in wellbeing.

In some cases, as a result of considering potential social consequences, additional mitigation is recommended to that already recommended by other consultants.

1.5 SIA methods

Methods in social assessment are focused around establishing communities of interest and then investigating potential social effects and issues related to these.

Communities of interest are generally defined in terms of factors such as geographic location, landownership and residence, patterns of employment and business relationships, service delivery and access, and recreational patterns¹⁰. Communities of interest for this assessment are discussed in considerable detail in Section 3. As noted previously, the principal social effects for the wider regional community arising from this proposal are associated with their interests as electricity consumers and providers of goods, services and skills for the construction and operation of the proposed wind farm. These effects have been described and quantified in the Economic Impact Assessment and will not be repeated here. Thus the primary focus of this SIA is on the interests of the immediate host community¹¹. Attention is also given to the wider regional recreational interests in the locality.

⁶ Primary data are data gathered by the researchers themselves specifically associated with this proposal.

⁷ Secondary data are from sources gathered by others, either in relation to this project, or in relation to similar projects, or for other purposes altogether, but with relevance to this project.

⁸ Benefits are related to future costs of electricity supply, reduced transmission line losses, increased diversity of sources for electricity generation, and increased security of supply; refer to Brown Copeland & Co Ltd, 2006, pp.9-12

⁹ Refer to Brown Copeland & Co Ltd, 2006, pp.12-13.

¹⁰ Taylor Baines & Associates, 1997. Communities of Interest in the Waitaki Valley: a preliminary assessment. pp.3-10.

¹¹ Described geographically and socially in Section 3.

A combination of demographic analysis and key informant interviews was used to identify these communities of interest. Interviews with community representatives¹² helped to establish the geographical boundaries of the immediate host community for the purposes of targeting subsequent property-level interviewing. In the main phase of social assessment, interviewing covered a high proportion of landowners living within 10 km of the proposed wind farm, encompassing both farming households and other residents. Other interviewees were selected on the basis of their roles as service providers in the host community¹³, or in order to follow up on particular issues raised during the assessment¹⁴. Appendix 1 contains the consultation record for this assessment.

The assessment did not involve 'a survey' in the sense that most people think of surveys. That is to say, we did not have a fixed set of questions which was asked of every single person interviewed. Such a method is very rarely used in social impact assessment work, primarily because it is an inflexible way to investigate potential issues and effects that may vary considerably from location to location. Rather, we adopted the use of semi-structured interviews.

Each interview began with an explanation of the SIA role - being to assess effects, not to advocate for the project - and discussion of the proposed project, with related maps and diagrams. The scope of the interview was then explained, noting that it would cover:

- (i) background information on the local community and their particular interests in the area (i.e. as landowners, residents, work or business interests, community involvements, etc.);
- (ii) any issues and potential effects likely to be of importance to them - both during construction and during on-going operation post-construction;
- (iii) any other issues regarding the assessment process.

The issue of confidentiality was discussed with the interviewee, and appropriate assurances given to enable them to continue.

Each interview was thus driven primarily by the interests of the interviewee, rather than being pre-determined by a fixed set of questions from the interviewer.

The interview material was then analysed thematically by using a text database based on keywords.

¹² e.g. community board members for Strath Taieri, Mosgiel/Outram and Lawrence

¹³ e.g. teachers, school bus driver, rural delivery, police, etc.

¹⁴ e.g. forestry operators, quarry operator, recreational event organisers, etc.

1.6 Structure of this report

Section 2 provides a summary description of the proposed wind farm project, identifying the assumptions used in this assessment and the information basis for discussion during the assessment interviews.

Section 3 provides a description of the communities of interest, how they have been differentiated, and their important attributes.

Section 4 describes and assesses the various social effects, beginning with an overview and then presenting each main impact category in more detail.

Section 5 presents the conclusions of this SIA.

Appendix 1 contains the Consultation record for this SIA;

Appendix 2 contains a description of major events which have occasionally been hosted in the Mahinerangi area;

Appendix 3 presents results from a 2004 national survey by the Energy Efficiency and Conservation Authority (EECA) on public attitudes to wind farm developments in New Zealand;

Appendix 4 presents survey results on noise effects from Taylor Baines Rapid Appraisal (April 2005) and comparison with Shepherd Survey (January 2005).

2 PROJECT DESCRIPTION

2.1 Staged development and land ownership

TrustPower is seeking resource consents for a wind farm north of Lake Mahinerangi, called the Mahinerangi Wind Farm (MWF), the location of which is shown on Figures 1-3 of Volume 1 of the AEE. The wind farm would ultimately have an installed capacity of up to 200 MW. TrustPower indicates that the operation of the proposed wind farm may assist the utilisation of the hydro storage at its nearby Waipori Hydro Electric Power Scheme.

TrustPower's intention is to build the wind farm in stages, most likely of 100 MW each.

TrustPower originally applied to the Dunedin City, Clutha District and Otago Regional Councils for Resource Consents to build a proposed 300 MW wind farm on a mix of private and Dunedin City Council owned land. TrustPower has now decided to apply only for consents related to developing the wind farm on private land.

As a result of the changes, TrustPower withdrew its original Resource Consent applications and submitted revised Resource Consent applications for a 200 MW wind farm to the Clutha District and Otago Regional Councils.

The proposed 200 MW development envelope incorporates 1,723 hectares in parcels of land¹⁵ owned by TrustPower, Landcorp, and three families - the Beattie, Hall and Thomas families - refer to Figure 2 of Volume I of the AEE showing the property boundaries.

2.2 Development envelope, turbine size and turbine numbers

The maximum turbine size will be 3.0 MW¹⁶ with a maximum height of 145 m (to the top of the blade) and the minimum turbine size will be 2.0 MW¹⁷. Thus, depending on the turbine size selected, there would be either 66 of the larger turbines or 100 of the smaller turbines. The two turbine sizes would not be mixed. TrustPower advise that maintaining flexibility over the final choice of turbine size minimises the risk of any one turbine manufacturer exerting upward price pressure on a specified make and model of turbine.

Within the proposed wind farm development envelope, provision will be made for a substation site measuring 50 x 50 m. The elements within the substation will generally not exceed five metres in height. There will also be an operations and maintenance building within the development envelope. This structure is likely to be in the order of 20 x 20 m and no more than one storey in height.

Within the development envelope there will be a network of tracks formed for accessing the individual turbine sites. During the construction phase, these tracks will be up to 12 m in width, reducing to five metres following installation and commissioning of the turbines. Seven metres will be reinstated and revegetated while the remaining five metres will be retained as gravel access tracks.

¹⁵ Refer to Tables 1.1 and 1.5, Volume 1 of the AEE documents

¹⁶ Similar to the turbines being installed at TrustPower's T3 wind farm extension in Manawatu.

¹⁷ Boffa Miskell Ltd Visual and Landscape Assessment, May 2006, p.14.

No turbines are to be constructed within the Black Rock Scientific Reserve, or within an area around Bottle Rock.

2.3 Transmission lines

On the wind farm site itself, all connections between individual turbines and the sub-station will be underground so that no overhead lines are visible within the wind farm.

Power leaving the site from the substation will be carried on transmission poles to be located within or adjacent to the Eldorado Track road reserve, or on private property from where it will connect into the existing Transpower 110 kV transmission line to Halfway Bush on the outskirts of Dunedin. There is also a third option possible of connecting 27 MW of the MWF into Power Station 1 of the Deep Stream Enhancement¹⁸

2.4 Construction activity

Construction activity will be seasonal, allowing for the severity of winter conditions. For the purposes of this assessment of construction phase social effects, it is assumed that the construction phase will extend over a minimum period of two construction seasons with each construction season expected to be restricted to about eight months by winter weather constraints¹⁹.

Construction activity is generally expected to involve five-and-a-half day working weeks. However, TrustPower would like the flexibility to have work on a seven-day-a-week basis if this is necessary to keep all aspects of construction coordinated to schedule or to maintain the safety and integrity of construction works. Nevertheless, it is reasonable to expect that construction activity will take place only during daylight hours.

On site, construction activity will involve the creation of up to 37 km²⁰ of access tracks, lay-down areas for construction materials, excess overburden and turbine components, a temporary concrete batching plant, temporary storm water treatment facilities, site office and staff facilities. Each turbine platform will require some excavation as well as 290 m³ of aggregate and hardfill.

Off site, construction activity will be noticeable for the construction-related traffic that will be generated, particularly on local roads in the vicinity of the proposed site. Table 2 of the Transport Assessment describes the number of heavy vehicle deliveries and the probable origin of these. Heavy vehicle traffic will be associated with general construction activities²¹, bringing in materials for track construction and to supply the concrete batching plant, and for bringing over-dimension or over-weight loads comprising turbine components and transformer components.

¹⁸ Refer p.31 of AEE Vol.I.

¹⁹ Traffic Design Group Transport Assessment, section 7.3.11

²⁰ Assuming the maximum possible 100 turbine sites.

²¹ Bringing in earth-moving and crane equipment, concrete pipes for drainage, fencing materials, sub-station and transmission line materials and consumables.

The over-dimension and over-weight loads will originate from Port Chalmers or Dunedin. In this case, the preferred route is via the State Highway system - the designated route for over-dimension and over-weight loads - leaving SH87 to travel along Mahinerangi Road and then the Eldorado Track, as shown on Figure 5 of Volume I of the AEE documentation.

However, it is possible that aggregate and hard fill could be sourced from quarries much nearer the proposed site, in which case, an alternate route along Black Rock Road and Lee Stream Road may be preferred, depending on the precise location of the rock source. For making concrete and also possibly for dust suppression, it is intended to bring water from Lake Mahinerangi to the site, a route which involves a section of Mahinerangi Road and then the Eldorado Track. Water may also be sourced from the Deep Stream Reservoir currently under construction.

The number of heavy vehicle return trips has been estimated at 11,240. Spread over 16 months at 22 days/month, this corresponds to approximately 70 vehicle movements per day along the route²². Of this total, up to 3,500 will be associated with the carting of hard fill, base-course and aggregate, corresponding to approximately 20 vehicle movements per day.

It is expected that construction worker transport would be on a shared-vehicle basis, totalling some 15 return trips per day. Practically all of this vehicle traffic would originate from within the Dunedin construction labour market, and therefore access the site via SH87 and Mahinerangi Road.

2.5 Employment generated

It is planned that the on-site construction workforce will number up to around 80 employees²³.

The Mahinerangi wind farm site is within the generally accepted one-hour commuting distance²⁴ of major existing labour markets, including the Taieri Plains and Dunedin City.

Once operational, the wind farm would employ up to 8 additional people in operations and maintenance work (Op.cit., section 7.5).

²² Traffic Design Group Traffic Assessment, section 7.3.11.

²³ Traffic Design Group Traffic Assessment, section 7.3.12

²⁴ This expected commuting distance is based on previous experience with major construction projects.

3 DESCRIPTION OF THE SOCIAL ENVIRONMENT

3.1 Introduction

This section provides a description of the social environment for the proposed wind farm and the backdrop against which potential social effects can be assessed.

This includes a description of geographical location, the distances from settlements, the relationship to various catchments and areas of distinctive landscape quality, the historical associations with gold mining, the existing land uses and recreational activities, the composition and character of the local community, and access to services.

3.2 Location and setting of the proposed development envelope

The proposed development envelope is located within a rural area 70 km west of Dunedin by road²⁵. The development envelope covers an area of approximately 1,723 ha generally located along 'Eldorado Plateau' in upland farming country, at elevations between 600 m and 730 m above sea level. The extent of the envelope is some 5-12 km north of Lake Mahinerangi, which is the principal storage lake associated with TrustPower's Waipori HEPS. To the west and north of the site, at higher elevation, are the Lammerlaw and Lammermoor Ranges, and also the Te Papanui Conservation Park.

The development envelope abutts the boundary between Clutha District to the west and Dunedin City to the east; the development envelope being entirely within Clutha District. Access to this general area from the east is via SH87, which runs between Outram and Middlemarch. Access from the west is mainly via the unsealed rural road from Lawrence to Lake Mahinerangi. Neither Outram nor Lawrence have a direct visual connection with the proposed site, while Middlemarch is almost 30 km distant and the Three Mile Lookout near Dunedin is 40 km away.

The site encompasses portions of two main catchments, namely Lee Stream and Lake Mahinerangi catchments.

Access to the site will be from the Eldorado Track which runs through the southern end of the site. A high percentage of the site is used for pastoral agriculture and has at some stage been oversown with exotic grassland species²⁶. Adjacent to the site's northern boundary, the Dunedin City's water conservation area is largely retired from pastoral use and has regenerated with indigenous tussock grassland.

No part of the proposed development envelope is in the Strath Taieri Outstanding Landscape Area, the High Country Outstanding Landscape Area or the Te Papanui Conservation Park.

²⁵ TrustPower Ltd AEE, Volume I, p.9.

²⁶ The Archaeological Assessment (AEE Vol.1p.20) reports that, while European settlement of pastoral leases commenced in the 1850s, much of the change in ground cover currently observable occurred after the sub-division and sale of land by the Department of Lands and Survey during the 1980s.

Principal existing land uses in the proposed development envelope and its immediate environs include farming, science/conservation, and municipal water supply. Forestry is a predominant land use around the eastern and southern sides of Lake Mahinerangi but not on the site itself. The current vegetation coverage of the site reflects the land management practices, including burning and grazing, of the latter half of the twentieth century (op.cit.). There are no permanent dwellings on the site.

The Archaeological Assessment (op.cit., p.20) describes the historical associations of this area with gold mining activities during the second half of the nineteenth century, identifies specific archeological sites and remnants²⁷, mainly around the Lammerlaw Stream and its tributaries, and notes (p.20) the past influence of farm development activities (ploughing and oversowing) in reducing the stock of these sites and remnants.

3.3 Communities of interest

As signalled earlier in this report, communities of interest are generally defined in terms of factors such as geographic location, landownership and residence, patterns of employment and business relationships, service delivery and access, and recreational patterns.

The immediate host community is a relatively sparsely settled rural area bounded (indicatively) by Lake Mahinerangi and the Maungatua Hills to the south, the Te Papanui Conservation Park to the west, Deep Stream to the north and SH87 to the east²⁸. This resident community of interest is predominantly a farming community, including Lee Stream and Clark's Junction. The small fishing settlement at Lake Mahinerangi, which includes three permanently occupied dwellings, amongst a cluster of cribs, as well as several other properties south of the Lake, is also part of this immediate host community.

People in this host community will have the closest experience of the presence of the wind farm; some farming properties will be directly involved through hosting turbines, while others will be immediate neighbours or have views of the wind farm at distances between two and twelve kilometres. Some of these rural residents are also the most likely to be aware of the construction and maintenance activities on the wind farm site, and the traffic associated with construction activities.

Those who receive direct financial returns from the construction activities will potentially include providers of worker accommodation, rock and aggregate supplies, as well as earthmoving, cartage and contract building services. Given the proximity of the site to the greater Dunedin urban area, it is likely that a high proportion of construction workers will

²⁷ Including a quartz crusher, dwelling remains, dams and associated reservoir, water races, sluiced areas and a house.

²⁸ This is a rural area approximately 20 km by 20 km, with a permanently resident population at the 2001 census of fewer than 200 individuals in approximately 70 households. Comparison of Census Night population counts at Census Area Unit level for 2001 and 2006 indicate little overall change.

come from the regional construction labour market^{29, 30, 31}. It is possible that some of these workers may choose to rent local accommodation on a weekly basis in order to reduce the time spent travelling to and from the construction site. Rock and aggregate supplies could possibly be sourced from several local quarries³², as alternatives to sources further away, thereby reducing transport costs. Providers of other construction-related services are most likely to come, via competitive tender, from the regional market for such services.

Those who receive direct financial returns from the operation of the wind farm will be the four private landowners³³ on whose properties turbines are located.

Those employed in the operation and maintenance of the wind farm will require specialist skills and are therefore most likely to come from the regional market for such services.

Aurora Energy Ltd, the Dunedin-based lines company, has 75,000 consumer connections, located in two distinct geographical areas: the largely urban area on the east coast around Dunedin City itself, and the sparsely populated rural area of Central Otago³⁴. Electricity to consumers in the host community area is not carried by the Aurora Network distribution lines. These electricity consumers take a feed from the national grid near Ranfurly.

Department of Conservation staff interviewed describe the Te Papanui Conservation Park as a substantial recreational destination, intended to cater particularly to the urban population of Dunedin. This is confirmed by other recreational users who noted that the Park is at the limit of day trips from Dunedin in terms of the time required to travel there and back.

²⁹ Of the 20 workers presently involved in constructing the Deep Stream hydro electric facility, six come from Blenheim and have rented a house on Mahinerangi Rd, four come from Dunedin or Mosgiel, while ten commute daily from Alexandra.

³⁰ It is likely that a proportion of workers needed for the erection of turbines will come from overseas; for example, from Denmark in the case of Vestas turbines.

³¹ The existing occupations of people living in the immediate host community - refer to Section 3.4 Employment - and the intensiveness of farming activity for those employed in the farming sector suggest it is unlikely that many local residents would be involved in the construction labour force.

³² Two quarries exist on adjacent farming properties (Doherty and Nichol) within the host community area, near the eastern end of Lee Flat/Black Rock Roads

³³ Landcorp and three families.

³⁴ Aurora Energy Ltd website, <http://www.electricity.co.nz/profile.htm>

In broad terms, the geographical extent of these communities of interest is summarised in the following table -

Table 1 Basis for common interests - comparing the Mahinerangi area with the wider regional community

Basis of interest	Mahinerangi area	Wider region
Proximity - immediate host community	✓	✗
Those receiving direct financial returns from construction	✓ Possibly a few through opportunities for providing accommodation, aggregate and rock sources, and cartage services	✓ Mainly from Dunedin and surrounding areas
Those receiving direct financial returns from operation	✓ Four private landowners with turbines	✗
Employment opportunities	✓ Possibly a few construction jobs	✓ Most construction jobs Most O&M jobs
Electricity consumers	✗ Not Aurora Energy customers	✓ Aurora Energy customers
Recreation and tourism	✓ A few recreational users	✓ Most recreational users

3.4 The immediate host community - the Mahinerangi area

A farming community

Typically for New Zealand, the immediate host community is a predominantly farming community, and has been so for generations. Farming properties today combine a legacy of smaller (2000 ha) blocks broken up by the Lands & Survey Dept in the 1970s (in the western and eastern areas) with larger properties which have been in the same families, sometimes for up to four generations (in the central area). Many of the current farmers are aged in their forties and fifties, some with adult children expecting to take over the farming property in due course.

At the time of the Lands & Survey Dept farm settlement scheme of the 1970s, most of the farmland in the Mahinerangi area was in unimproved tussock grassland; thirty years later, relatively little tussock grassland remains below the 600 m altitude. Nevertheless, the conversion of tussock grasslands to improved pasture continues today as an accepted part of farm development. Farming has intensified progressively over the past thirty years: improved pasture to support more intensive grazing; sub-division of paddocks to enable rotational grazing, establishment of wind breaks to improve micro-climates for stock and crops, introduction of new types of stock including deer, fencing off gullies to avoid erosion on steeper land and prevent stock getting into wetter areas. Almost all the trees which can

be seen in the view northwest from the junction of Mahinerangi Road and SH87 have been planted in the last 20-30 years.

There has been considerable development of areas of improved grasslands, replacing unimproved grasslands and areas of tussock, and thereby creating the ability to increase the stocking rates by a factor of two or three³⁵. There are no collective farm water schemes in the area. A number of streams rise on the Eldorado Ridge - Lee Stream, Broad Stream, Canton Stream, Black Rock Stream - and farm stock drink from these. Some farmers have invested in water storage dams in order to alleviate some of the constraints of variable rainfall. In contrast, land owned by Dunedin City to protect municipal water supply has been totally de-stocked.

One of the Doherty farming properties near SH87 has in the past been a local MAF monitor farm, which had a farm discussion group associated with it.

Farm amalgamation has also occurred across the Mahinerangi area. There have been several drivers for this: more stringent financial circumstances forcing improved efficiencies and advantages of increased scale; farm succession and the prospect of sharing farms among several siblings. In some cases, farm amalgamation was associated with a reduction in farm workers living on the property, resulting in a number of farm dwellings that are either empty or rented out to people who commute to work elsewhere.

Some property amalgamations have resulted in properties which span local roads such as Black Rock Road, Lee Flat Road, Settlement Road and Mahinerangi Road. In these cases farming operations involve regular although not always frequent movement of stock across and along some sections of road³⁶.

Landcorp owns two large farming properties near Lake Mahinerangi - Thornycroft Station along Eldorado Track, and Waipori Station on the south and western sides of the Lake. The wind farm development envelope includes some of Thornycroft Station.

Two farms in the immediate host community have operating quarries on them. The Doherty property on Black Rock Road has a quarry which has been operating for some years under a management contract with Blackhead Quarries. So far, its operation has been episodic, with intense periods of activity³⁷ followed by little activity at all for several weeks. Over the past seven to eight years, there have been typically ~700 truck loads of rock taken out of this quarry each year, mainly for roading purposes. At the present time, one truck and trailer unit is carting 5-6 loads per day for TrustPower's Deep Stream HEPS construction. The Nichol property on SH87 has recently gained resource consents to open a quarry.

The area hosts a variety of farm-based recreation. This includes dog trials at Deep Stream in December for maiden/novice dogs, with the open competition at Taieri in March; occasional motor cross events and horse trials take place on one of the Nichol properties,

³⁵ Conversion of land from unimproved tussock grassland to improved grassland species typically results in increasing the stock carrying capacity of the land by between 100% and 200%, based on actual farmer experience in the host community.

³⁶ Discussions during the assessment interviews identified particular farming situations and lengths of road where such stock movements occur.

³⁷ For example, two truck and trailer units might take eight loads per day each for a couple of weeks, followed by no loads at all for several weeks in a row.

while the Pleasure Horseman have staged events on various local farming properties in past years; the good rolling country means the area plays host to visiting Hunt Clubs from South Canterbury to Te Anau³⁸; several farms also provide angler access to streams.

The locality also hosts the Black Rock Scientific Reserve, established in 1970 to monitor the condition of native tussock grasslands after the removal of grazing and burning practices.

The western boundary of the host community area is the Te Papanui Conservation Park. This is a 20,000 ha area of conservation estate formed in 2003 as a result of finalising tenure review on several high country leasehold properties along the Lammermoor, Lammerlaw and Rock and Pillar ranges. Other parts of these properties have been free-held and are still farmed productively.

Lake Mahinerangi

There is no major settlement in the immediate host community³⁹. While the fishing village at Lake Mahinerangi has some dwellings, mostly small cribs, only two have been permanently occupied for any length of time⁴⁰, although a third has been occupied permanently during 2006. The two Landcorp stations flank the Lake on its northern, western and southern margins and Landcorp personnel⁴¹ occupy eight dwellings at various locations on these properties, including a cluster of four dwellings on the original Waipori Station. There are two other properties on the southern shore of the Lake; one occupied house and an adjacent piece of land without a dwelling.

For most crib owners in the fishing village, ownership has been for a decade or longer. Almost without exception the crib owners come from the Dunedin sector. These cribs are all leased on land owned by the Clutha District Council, which is currently seeking to purchase more land on the northern side of the Lake, near the Edgar Stark Bridge, with a view to re-settling some of the crib owners and allowing them to free-hold their titles.

Not many crib owners visit their cribs during the winter⁴²; occupancy for many is very episodic and seasonal. For the majority, the main use is made of the Lake during the Christmas, New Year and January holiday period, and otherwise over long holiday weekends. Principal reasons for visiting are described as *“doing nothing, relaxing, fishing and duck shooting in season, kids swimming in the summer, water skiing; trailer sailors;*

³⁸ Generally on one person's property at a time; they 'drag' scented bait rather than hunt to kill animals; most Sundays from the end of Feb till the end of June.

³⁹ The Lake used to be the site of the Waipori township which was established during the gold rush days of the 19th century and submerged when the Lake was created.

⁴⁰ One household has been in residence for 20 years while another has been in residence for 12 years. Between them there are 5 occupants.

⁴¹ The expanded Waipori Station - an amalgamation of the original Waipori Station with two adjacent farming properties - currently employs 10 staff, three of whom have partners. Junior staff come for 1-2 seasons while senior staff come for 3-4 seasons. At present, no one living in the Waipori cottages commutes to work in town, although this has happened in the past. One partner from Thornycroft Station commutes to work in town.

⁴² Crib Owners Committee members suggested that no more than 10 cribs are occupied regularly on weekends throughout the year.

shooting; sometimes group activities organised with 4WD vehicles⁴³; walking up the Nardoo Stream or to Stony Creek Reserve“. Just about every household in the village owns a boat of some sort. This is considered essential to achieving good access to all parts of the lake, since many of the forestry roads around the Lake are closed to the public. Recreational visitors to the Lake from the Lawrence side tend to visit on day trips, mainly for fishing. Local residents report that *“you don’t tend to see many others around the fishing village; it’s not widely known; access to the Lake is not easy unless you have a boat”*. They also note that there are three commuters who pass through daily on their way to Lawrence.

The Lake Mahinerangi area has a strong historical association with 19th-century gold mining. There are a number of heritage sites, including several heritage covenant areas

Forestry

Two major companies have forest interests in the vicinity of Lake Mahinerangi - City Forests and Wenita. Forests were planted more than 30 years ago and are now being harvested⁴⁴ and replanted. Forest land surrounds both sides of the southern end of the Lake.

City Forests’ Waipori Forest has three harvesting crews working full time, two of which provide logs which are trucked out along Mahinerangi Road, while the remaining trucks use alternative routes on the southern side of the Lake. City Forests indicate that typically there have been 20 loaded movements⁴⁵ per day travelling along Mahinerangi Road, with a daily maximum of no more than 30. Consequently, Mahinerangi Road is sometimes referred to by locals as ‘the log route’. Traffic count data in 2003 from Transit NZ, Dunedin City and Clutha District indicate about 10 heavy vehicle movements per day along Mahinerangi Road, as presented in the Traffic Design Group report at pp.11-13.

Typically, the first trucks⁴⁶ arrive on site between 5.30 am and 6 am; several residents along Mahinerangi Road reporting that they are woken regularly by the first logging trucks each day. The last loaded logging trucks generally depart along Mahinerangi Road by about 4.30 pm. These logging operations generally occur five days per week, occasionally six days per week.

There are no restrictions on logging truck drivers in terms of the hours they operate, and no formal liaison requirements with local farmers concerning stock movements on the road⁴⁷. However, for their own convenience, City Forests has installed road-side markers at half-kilometre intervals along forest roads so that drivers can communicate with each other over radio telephone about their location. City Forests indicate that this appears to work well as a

⁴³ Such as trips to Moss Swamp, Knights Dam or Lake Onslow.

⁴⁴ City Forests have been harvesting for some years, while Wenita’s Maungatua Block is expected to be logged over the next 2-4 years. Wenita indicate that because of the location of their forestry blocks, it is almost certain that the logs will not be carted out along Mahinerangi Road, since a shorter and easier route is likely to be out through Berwick.

⁴⁵ i.e. 20 empty trucks arriving and 20 loaded trucks departing each day. City Forests noted that if all the logs currently being taken out of their Waipori Forests were to be trucked out along Mahinerangi Road, a daily maximum of 40-50 loads would be likely.

⁴⁶ Some trucks carry two loads per day; some carry 3-4 loads per day.

⁴⁷ Interviews suggested that there is only one farm along Mahinerangi Road that is involved in moving stock along the road, and that this occurs typically once a week.

road safety measure along the forest roads. While City Forests note that logging truck drivers have never reported issues with other road users along Mahinerangi Road, it is not uncommon for other road users interviewed to remark on their experience of hazards and discomfort caused by the meeting logging trucks, particularly in the vicinity of blind corners on the road. Some drivers report a general tendency to cut corners; they also report that in dry, dusty conditions, they sometimes have to stop briefly for dust clouds created by large trucks to settle before continuing on safely.

Access to services and organisations

In terms of community facilities in the immediate host community area, the primary school and adjacent community hall at Lee Stream is the most obvious community focal point for children and families, while the pub at Clark's Junction is another important social focus, particularly for men. A local playgroup and Plunket group meet at the Lee Stream Hall. Other services which operate locally are the five-days-a-week Rural Delivery postal run⁴⁸, carrying mail, parcels and newspapers to rural homes, and the school buses collecting children for the Lee Stream Primary School and returning them home⁴⁹. Secondary school-age children must travel each day to Mosgiel or attend one of the boarding schools in Dunedin. A local community newsletter, distributed monthly throughout the RD2 area⁵⁰, has just folded and is likely to merge with the Taieri Pet, produced out of Middlemarch.

Shopping, medical services, farm services, professional services and recreational facilities are all accessed outside the immediate host community area, with Dunedin being within three quarters of an hour's drive at most, and Outram and Mosgiel being considerably closer.

The Police have a permanent presence in Middlemarch, with responsibility covering the Middlemarch area as well as much of the immediate host community as far as Lee Stream. Areas further south, including Lake Mahinerangi and Waipori Falls are the responsibility of the Mosgiel Police.

There is a Volunteer Fire Brigade based in Middlemarch, operating on a pager system. 24/7 coverage of fire and emergency services for this area is provided from the Fire Service in Mosgiel.

Sports clubs and other cultural pursuits are spread around. Rugby and netball are at Outram, while hockey is at Middlemarch. Golf and pony clubs are available at both Outram and Middlemarch. The Rodeo Club is at Outram.

Other pursuits such as gymnastics, swimming and ballet require travel further afield, most likely into Dunedin.

⁴⁸ The Rural Delivery van generally passes through the area between 7.00 am and 9.15 am each weekday.

⁴⁹ Three school buses are contracted from Otago Road Services. The Mahinerangi bus collects 10 children (9 from farming families) from Mahinerangi, Lee Flat, Settlement and Black Rock Runs Roads. The Rocklands bus collects 9 children, three of whom are from farming families along Black Rock Road. The Hindon bus collects 16 children from the Hindon area east of SH87. The Mahinerangi School bus travels on its circuit between 7.45 am and 8.50 am. The afternoon trip is between 3 pm and 4 pm.

⁵⁰ From Horseshoe Station near Outram in the south, to Sutton in the north.

Employment

[Note: At the time of writing, detailed results from the 2006 Census have not been released. Publicly released 2006 census data is only at the Census Area Unit level, and not at the meshblock level. Consequently, the only population trend data available up to 2006 are for larger geographical units than the immediate host community.]

As expected, for a predominantly rural area, most working people are employed in the farming sector⁵¹. However, several recent trends are evident in employment patterns, that are related to changes in farming as well as broader economic change. With the amalgamation of farming properties and the drive for greater efficiencies in farming enterprises, the total number of people employed directly in farming has declined. Because of proximity to the large job market of Dunedin and the Taieri Plains, it is feasible for people to live in the country and commute to their work. Another well-documented⁵² driver for employment change in rural areas over the past two decades has been the need for households to have two income earners in order to sustain viable livelihoods. Thus, increasing numbers of rural households have household members commuting to work. This trend is reflected in the diversity of industry sectors represented in the employment statistics.

At the census in March 2001, two thirds (65%) of host community residents aged 15 years and over were working in the farming sector. This leaves 35% working variously in Health and community Services (8%), Property and Business Services (8%), manufacturing (5%), Accommodation, cafes and restaurants (5%), Transport and Storage (3%) and Wholesale and Retail Trade (3%).

During interviews for this assessment in September, many reported the incidence of people living in the host community but working in places such as Lawrence, Mosgiel and Dunedin. These included occupations such as teacher, auditor, freezing worker, office worker, nurse aid, and so on. In these times, it is of course feasible to live in the country and work at something other than farming (for example, accountancy) without having to commute.

Population - composition and trends

[Refer to note on 2006 census data at the beginning of the previous section on employment.]

The usually resident population of this rural community was recorded as 246 at the 2001 census, down from 300 at the 1991 census, a reduction of some 18%. The only part of the host community area to show an increase in population during this period was the rural area closest to Outram in the south, which saw an increase from 48 in 1991 to 57 in 2001. By contrast, the remaining more remote rural areas from town experienced a decline over this period from 252 to 189 (down 25%). Several people interviewed confirmed this decline in the rural population, attributing it mainly to farm property amalgamations.

⁵¹ Traditionally, statistics for this sector incorporate farmers, farm workers and those providing services to farming, although various statistical sources cover different aspects. Note also that a very high proportion of people reported working at home (44%) compared with 10% nationally or regionally.

⁵² C. Nicholas Taylor, Heather McCrostie Little and Wayne McClintock 1997. *Entrepreneurship in New Zealand farming: a study of farms with alternative enterprises*. Technical Report 97/7, MAF Policy, Wellington. C. Nicholas Taylor and Heather McCrostie Little (1995). *Means of Survival, a Study of Off-farm Employment in New Zealand*. Taylor Baines and Associates, Christchurch

In 2001, the composition of the resident population was distinctively rural in various ways. It was almost exclusively European⁵³, had no multiple-family or non-family households, had no one-parent families, had lower than average proportions of teenagers and people in their twenties⁵⁴, had a low proportion of people in retirement age, but a high proportion of young families⁵⁵, had more people with vocational qualifications, but fewer people with university degrees⁵⁶.

In the period 2001 to 2006, the Census Night population of Middlemarch and the rural Strath Taieri area declined 7% and increased 4% respectively, suggesting there has been little change in the population of the immediate host community over this period. In contrast, the Census Night population of Outram and the Taieri Plains increased by 7% and 12% respectively. In neighbouring Clutha District, the Census Night population of the township of Lawrence grew by 8% while the surrounding rural area of Tuapeka declined by 8%.

The longer-term decline(1991-2001) in resident population in the immediate host community is reflected in the Lee Stream school roll, which has fluctuated between about 40 and 50 students during the past ten years, a level only half that of ten years previously⁵⁷. The school still provides for New Entrants to Form 2 (Years 1-8), with 2.5 teaching positions (including a teaching principal) provided by Ministry funding, supplemented by a half-time position funded by the Board of Trustees.

⁵³ In 2001 - 96% European, 3% Asian ,1% Maori.

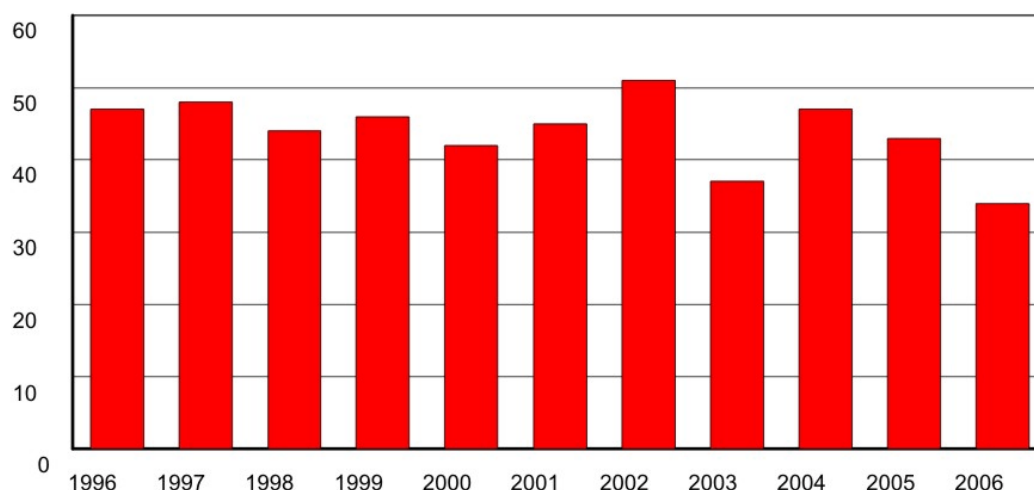
⁵⁴ % 10-19 year olds = 10% locally compared with 15% regionally and nationally;
% 20-29 year olds = 10% locally compared with 14% regionally and 13% nationally; this reflects teenagers away at boarding school or post -secondary training, or seeking jobs in town and living away from home.

⁵⁵ % 65+ year olds = 5% locally compared with 14% regionally and 12% nationally; this reflects the tendency for rural people to retire to town;
% under 9 year olds = 23% locally compared with 12% regionally and 15% nationally; this reflects the number of young families associated with each generation of farming.

⁵⁶ % with vocational qualifications = 28% locally compared with 18% regionally and nationally;
% with degrees = 3% locally compared with 11% regionally and 10% nationally.

⁵⁷ Reported as ~95 in the late 1980s, with a 4-teacher allocation then compared with 2.5 teachers in 2006.

**Figure 2: Lee Stream school roll - 1995-2006
July funding roll data
Sources: Ministry of Education, Lee Stream School**



Lee Stream School has had other influences to contend with as well. The Ministry of Education’s Network Review impacted on full primary schools. The bus carrying country children to Taieri College and Intermediate School travels directly past the school gate. Furthermore, the rising trend, mentioned above, of rural parents commuting to town for second jobs has also had effects. Some commuting parents have chosen to take their primary-age children to school in Outram, and Lee Stream School has not been able to afford to provide an after-school care programme for children whose parents are working in town, or children who have two parents working full time. Nevertheless, the school’s roll projection over the next few years is described as stable.

The school’s own financial resources come from a variety of local activities including a calf-rearing scheme, volunteer labour for catering, and tailing gangs.

Overall community character

Interviews with many local residents highlighted consistently a number of themes, and the fact that the sense of community has changed in the last couple of decades. These changes reflect various influences - the greater mobility with modern 4WD vehicles⁵⁸ and improvements in the quality of the roads, the increasing need for rural families to support themselves with second incomes, the family life-cycle progression which means that as children grow up past primary school age family activities become increasingly oriented towards town.

There is no general social hub in the immediate locality; instead, the tendency is for very localised social interactions to occur on a household basis. Apart from those associated with pre-school and primary school, there are not many local groups to belong to - the farm discussion group has ceased, as has the local branch of WDFW. As a result, for some the

⁵⁸ Even with snows, the roads are clear now by 10 am, rather than remaining blocked for several days, further reducing the sense of rural isolation.

sense of community is based around the school and play group, while for others community interests are more focussed on where recreation and services are; people are pulled towards where they work and where their children go to school.

As rural residents have extended their lifestyles and occupational range beyond the boundaries of the valley, Dunedin has become part of the social world on a regular basis - *“we’ve been dragged 30 km closer to Dunedin”*.

While no longer being experienced by many as a close-knit community, the immediate host community is nevertheless well-established.

Overall, this rural locality now has the appearance of being well developed and engaged in moderately intensive pastoral farming, so that farming is strong. The employment base is becoming increasingly diversified. Despite the fact that social connections are now less focussed locally, many express a strong affinity with the locality.

3.5 The wider regional community

Within the wider regional community, the nearest towns are Outram, Mosgiel, Middlemarch and Lawrence. Of these, Outram and Mosgiel have the strongest associations with the proposed wind farm locality by virtue of being on the main transport route between Dunedin and the proposed wind farm site.

Outram

The township of Outram is 25 km away from the proposed wind farm site and has no direct visual connection with the site. It is the nearest town with farm services and community infrastructure, on the route to Dunedin for many who live in the Mahinerangi area. It is also on the route for construction traffic, particularly over-dimension loads such as turbine components and over-weight loads such as transformers.

Outram is within the labour market area from which construction and operational and maintenance workers for the proposed wind farm are most likely to come. It is also in the Aurora Networks area for electricity distribution.

Mosgiel

The town of Mosgiel is 34 km away from the proposed wind farm site and also has no direct visual connection with the site. It hosts the nearest major supermarket for rural residents in the Mahinerangi area, as well as a range of other commercial and social services, including Taieri College. It is the location of employment for some who live in the Mahinerangi area, including employment in industrial activities.

Mosgiel is within the labour market area from which construction and operational and maintenance workers for the proposed wind farm are most likely to come. It is also in the Aurora Networks area for electricity distribution.

Middlemarch

At a distance of almost 30 km, Middlemarch lies at the northern extremity of the visual catchment for the proposed wind farm. However, it has some existing social connections

with the immediate host community in terms of children's sport and recreation⁵⁹, conveniently linked as it is by SH87.

The population of Middlemarch declined slightly⁶⁰ between 1991 and 2001, reflecting the fortunes of the farming hinterland⁶¹ which experienced even greater declines over this period. The age distribution of the Middlemarch population is skewed somewhat by the exodus of youth and young adults in search of employment. More recent data indicates that the population of the township has continued to decline slightly⁶² even though the population in the surrounding rural area has increased slightly.

Middlemarch has long been a rural service centre for the surrounding farming community, and continues this function today. The rural business sector of the town comprises a shop, pub, garage, postal agency, stock and station agency, three transport firms and several agricultural contractors. Specialist services such as electricians and plumbers are sourced from larger centres such as Ranfurly and Mosgiel.

Population and business decline in the town has been halted by the advent of rural tourism. The Central Otago Rail Trail, which starts - or finishes - at Middlemarch is the primary focus for tourism activity at the present time. It is currently the fastest growing tourism activity in this part of Otago. Operating for eight months of the year, due to climatic constraints on biking, the Rail Trail currently attracts some 6,000 visitors a year, spending approximately \$1.7 million⁶³.

Numerous efforts have been made to build up the general rural tourism infrastructure around the basis of the Rail Trail activity, aiming to create full-time livelihoods and expand viable employment opportunities. These include B&B accommodation, a café, and local heritage tours and farm garden visits. Other attractions include the nearby Sutton Salt Lake and Macraes opencast mine. Tramping on the Rock and Pillar Range northwest of the township caters to another set of interests (see Section 6.5). Recently consents were granted for the establishment of "a bicycle hire service complete with café, accommodation, a cycle museum, mini-putt course and information centre"⁶⁴.

In addition to local employment, about half a dozen Middlemarch residents commute daily to jobs in Mosgiel or Dunedin via SH87, while 3-4 residents are employed at Macraes Mining.

⁵⁹ For example, some children from the Lee Stream community take part in pony club activities at Middlemarch.

⁶⁰ Usually resident population in 1991 was 198, falling to 183 in 2001, a decline of 8%.

⁶¹ Usually resident population of the Silverpeaks Statistical Area Unit in 1991 was 489, falling to 411 in 2001, a decline of 19%.

⁶² Provisional 2006 Census Night data for the Census Area Unit of Middlemarch shows a count of 170 compared with 183 on Census Night 2001. Provisional 2006 Census Night data for the Census Area Unit of Strath Taieri shows a count of 410 compared with 396 on Census Night 2001.

⁶³ ODT, Tuesday 21 February 2006, p.15.

⁶⁴ ODT, Thursday 23 February 2006, p.5.

Middlemarch has a primary school, whose roll has fluctuated over the past ten years between 56 and 76⁶⁵. However there is no secondary school in Middlemarch and secondary-age children must travel to Mosgiel daily or attend boarding school.

Middlemarch is not part of the Aurora Networks area for electricity distribution. It is close enough to be considered within the labour market commuting distance for jobs at the wind farm site.

Lawrence

The town of Lawrence is 19 km southwest of the proposed wind farm site and has no direct visual connection with the site. The town is connected to Lake Mahinerangi by the largely unsealed Waipori Road, and an alternative route up to the Lake from the west is Mitchells Flat Road leading up from Waitahuna.

Heritage tourism based on the Tuapeka goldfields has been a focus of recent economic development. However, local business representatives indicate that most traffic through or out of Lawrence is heading for Queenstown.

Lawrence is not part of the Aurora Networks area for electricity distribution. It is close enough to be considered within the labour market commuting distance for jobs at the wind farm site.

Dunedin

Dunedin, the major regional urban centre, is some 45 km⁶⁶ to the east of the proposed wind farm site. Long-distance views of the proposed wind farm can be seen from the Three Mile Hill Lookout, at a distance of 40 km. It is likely that the Dunedin regional labour market will be the main source of construction workers as well as the Operations & Maintenance workforce. The wider Dunedin urban area is the primary electricity distribution area for Aurora Networks.

Dunedin and its environs is the main source of recreational visitors to the Otago uplands area (see below for more detail).

The employment and electricity consumer effects of the proposed wind farm project have been assessed and quantified by Brown Copeland and Co in the Economic Impact Assessment. The recreational effects are addressed in this Social Impact Assessment.

Recreational users of the area in which the proposed wind farm is located

The principal groups of recreational users identified are trampers and visitors to Te Papanui Conservation Park, and people taking part in one of a number of heritage/recreation or multi-sport endurance events which have made use of the area in the past.

Other recreational activities have been described within the immediate host community.

⁶⁵ July roll data provided by the Ministry of Education (February 2006).

⁶⁶ Straight-line distance to the City Centre.

Trampers and visitors to Te Papanui Conservation Park

Although there are as many as 30 different walking and tramping groups in Dunedin, only five or six are involved in longer walks outside the City boundary. Enquiries during this assessment suggest that in terms of recreational day tripper destinations for walking and tramping, the most popular areas are those closest to Dunedin City itself, namely the Otago Peninsula and the Silver Peaks Hills between SH1 north of the City and the Taieri River gorge⁶⁷. Further afield from Dunedin, yet still within the ambit of day trips, are the areas around Berwick, the Maungatuas and Lake Mahinerangi, around the Rock and Pillar Range, which lies immediately north-east of the Te Papanui Conservation Park. In terms of walking and tramping interests, the Rock and Pillar Range is the more established destination, with tracks and two substantial huts⁶⁸ for overnight stays. These huts are part of infrastructure associated with the ski field established on the Rock and Pillar Range during the 1920s, before the Central Otago ski fields were developed⁶⁹.

Keen walkers are prepared to drive for up to an hour and then venture on 6-hour tramps, sometimes in large groups of 20-30 at a time. However, because of the risk of sudden changes in the weather and exposure to the elements in the Te Papanui Conservation Park, the Maungatuas and Waipori Hills offer more sheltered walking options *“and a safer bet”*.

Department of Conservation (DoC) staff interviewed describe the Te Papanui Conservation Park as a substantial recreational destination, intended to cater particularly to the urban population of Dunedin. They note that while the area of the Park has been accessible to recreational users for many years, when it was made up of segments of high country leasehold properties, it has been established as a Conservation Park only in the last two years. They describe the important values of the Park as associated with a wilderness experience - expansiveness, tussock lands and torrs - and note that the Park is subject to increasing development outside its boundary on several sides. In line with these stated values, ‘man-made’ recreational infrastructure is likely to be kept to a minimum within the park⁷⁰, while promoting on foot a “wander at will” philosophy.

In terms of relative utilization by members of the Otago Tramping and Mountaineering Club (OTMC) on club-organised trips, the Rock and Pillar Range is typically the destination about three times a year, while a day trip to the Te Papanui Conservation Park in March 2006 was the first such visit to that area since it opened two years ago. Another OTMC trip visited the Basin 2005. Traditionally, visits to this area have targeted locations such as Nardoo⁷¹, The Basin, Ship at Anchor, or the Deep Creek Intake. Alternative walks through tussock hill

⁶⁷ For an overview of walking tracks and tramps in the Dunedin area and environs, see the map in Bishop and Hamel, 2002, *From Sea to Silver Peaks: A guide to the Walking Tracks, Beaches, Viewpoints and Special Attractions of Dunedin*. Silver Peaks Press. p.11

⁶⁸ With accommodation for 12 persons in each. Trampers have recently formed two trusts - the Big Hut Trust and the Leaning Lodge Trust - for the purposes of maintaining these facilities.

⁶⁹ Development of the Coronet Peak ski field resulted in the Rock and Pillar ski field being abandoned in 1953.

⁷⁰ DoC is still in the process of developing recreational infrastructure, but expect the infrastructure to be centred on a focal point at the northern entrance, providing for good access/egress and interpretation facilities. Accommodation facilities are not expected, although staying overnight in tents is not disallowed.

⁷¹ However, the OTMC has not organised trips to the Nardoo for many years.

country closer to Dunedin have become scarcer, with the loss of much of this land cover in the Silver Peaks area, due to a combination of DoC reserve management⁷² and the replacement of pastoral farming by forestry.

Numbers of visitors to the Park at the present time are difficult to quantify⁷³, but are expected to grow steadily in future as public awareness increases and as recreational infrastructure in the Park is established. Use of the Park is distinctly seasonal, and strongly weather-related, due to its relative remoteness and the speed with which weather conditions can change and become unsafe.

Qualitatively, departmental staff report that trail bike users are responsible for the greatest numbers of vehicles⁷⁴ at the present time, while 4WD vehicles are responsible for the greatest numbers of people visiting, many of whom are family groups or on organised club events. Smaller numbers of visitors to the Park are engaged in horse riding, mountain biking and walking, but all these access the Park by vehicles⁷⁵. Others include people with interests in botany or natural landscape photography and painting.

Access to the Park can be from several directions⁷⁶. However, it appears from a range of interviewees, that the main route into the Park is via the Old Dunstan Road, which leaves SH87 at Clark's Junction. While the Old Dunstan Road is a long-established route⁷⁷ connecting Dunedin with Central Otago, it is not sealed over the Lammermoor Range and is closed to vehicular traffic for 3-4 months each year in winter. This does not mean that the Park itself is closed to the public during this period. DoC reports that there is some cross country skiing in winter.

Several trampers/hunters interviewed suggested that it is important to retain several entry points to Te Papanui Conservation Park. If entry is confined to the Old Dunstan Road, then many parts of the Park will become inaccessible to day trippers, simply because the distances are too great. Several comments were made to the effect that de-stocking of the Conservation Park has allowed the snow tussock to grow to the extent that walking off the tracks is now difficult in many places. Destinations at the southern and western end of the Park are more readily accessible from the Eldorado Track or the Nardoo Stream entrances. The Nardoo Scientific Reserve was one of the first scientific reserves created in the late 1970s, and is visually separated from the Eldorado Ridge.

The area of the proposed wind farm development envelope is not known as a recreational destination itself, even though the Eldorado Track access to the Conservation Park passes through the western end of the envelope.

⁷² i.e. regenerating bush and scrub is replacing open tussock land in this DoC reserve.

⁷³ No survey data have been discovered and DoC had only recently begun monitoring activities of any kind by the beginning of 2006.

⁷⁴ Typically taking their cars and trailers to the end of the sealed section of the Old Dunstan Road, before riding their bikes into the Park.

⁷⁵ Horse riders 'float' their horses to the Park.

⁷⁶ Via the Old Dunstan Road and Deep Stream catchment; from Lawrence; from Beaumont; via Lake Onslow and via Lake Mahinerangi and the Eldorado Track, and up the Nardoo Stream.

⁷⁷ DoC described it as historically the main access route to Central Otago for people in Dunedin.

Recreational deer and pig hunters occasionally visit areas in the vicinity⁷⁸, using DoC permits. However, the areas are not greatly used since there has never been any difficulty gaining permits.

Other major events

The wider area is noted for hosting several major events occasionally, each involving hundreds of participants. The annual Cavalcade caters for heritage enthusiasts, while the Arrow 24-hour Endurance Race and the Southern Traverse are cross-country multi-sport endurance events.

More detail on each of these events is provided in Appendix 2.

⁷⁸ Stony Creek, Nardoo Stream Reserve, Rocklands Station

4 SOCIAL EFFECTS AND ISSUES

4.1 Scope of effects assessed in the SIA

This social impact assessment has focused primarily on the social effects likely to be experienced by people living within the visual catchment of the proposed wind farm, hitherto referred to as the immediate host community. It also assesses the likely social effects on visitors to the area for recreation.

Other social effects in the wider region are important as well. These are summarised here, based on information provided in the Economic Impact Assessment prepared by Brown Copeland and Co.⁷⁹ While the Brown Copeland assessment expresses its evaluation in economic terms, and provides quantification of the expected effects in some cases, the summary presented here relates these effects to the social wellbeing framework described in Section 1.3 and quantifies potential effects in terms of the numbers of people affected.

Regional social benefits can be expected to accrue to electricity consumers and suppliers of labour and skills in construction services and operational and maintenance services.

The Aurora Network supplies electricity to some 75,000 consumers and Brown Copeland conclude that they can expect benefits through reduced transmission-line losses and reduced supply interruptions⁸⁰ resulting from increased security of supply and increased diversity of supply. These benefits indicate improved quality and access to an essential service, which is an important element of wellbeing. Furthermore, on the basis of expressed preferences⁸¹, it is likely that a substantial majority of these electricity consumers will experience positive associations with using electricity generated from wind.

The other significant social benefit at the regional level is associated with employment. Brown Copeland has assessed that project construction will support 80 on-site jobs and a further 60 off-site jobs⁸² during the period of construction, while the operational wind farm will require the work of 8 additional people in operation and maintenance activities. These are significant positive contributions to the livelihoods of workforce members and their families.

4.2 Overview of potential social effects for the immediate host community

This section aims to provide a summary of the social effects and issues of most concern to people who live or work within the immediate host community.

There is a range of potential social effects associated with construction activities and the future operation of the proposed wind farm. While the potential visual effects (Section 4.3)

⁷⁹ See Sections 6-9, pp.8-15.

⁸⁰ For domestic consumers, supply interruptions are generally at most a brief inconvenience or nuisance. However, for industrial and commercial consumers, "disruption in supply can have significant cost implications" (Brown Copeland, pp.11-12).

⁸¹ Refer to Tables 1,2 and 3 in Appendix 3, based on responses to a national survey commissioned by the Energy Efficiency and Conservation Authority

⁸² Indirect and induced employment; see Brown Copeland Section 7.5, p.13.

are in a literal sense the most obvious⁸³, with consequences for amenity values, landscape change and visitor experience, the potential effects due to the presence of construction traffic (Section 4.5) over two seasons of construction activity appear to be the most universal source of concern for people living locally. These include the potential social effects associated with travel delays, experience of road safety, levels of dust nuisance, potential conflicts with traditional movements of farm stock along rural roads, and the risk of construction vehicles carrying in unwanted weeds and seed sources (Section 4.6).

The potential effects of off-site turbine noise (Section 4.4) once the wind farm becomes operational is a matter of uncertainty for some residents neighbouring the proposed wind farm site, and this is the source of some anxiety. The uncertainty arises, not because the potential for noise effects has not been properly assessed⁸⁴, but rather because residents' confidence in the findings of the noise assessment is challenged by media reports of the experience of windfarm neighbours elsewhere in the country.

Other potential effects of concern during construction (Section 4.6) are associated with the visual aspects of earthworks, risks to water quality in streams which rise on the Eldorado Ridge from earth disturbance as well as imported water sources, and the risk of tussock fires associated with construction activities or worker behaviour. Other potential effects discussed in relation to the operational lifetime of the wind farm are associated with the risk from tussock fires and the risks from outsiders visiting.

The process of project development and consultation has resulted in some degree of social division and tensions in the local community (Section 4.7). However, this is not unusual at this stage of considering a proposal, and is less important than the potential social effect of such community polarisation continuing in the future if the proposal is approved, an issue over which there are mixed views in the local community.

Sections 4.3 to 4.7 that follow discuss each category of potential social effect. The general structure of these sections incorporates a description of community concerns, references to relevant technical assessments and a conclusion expressed in terms of the social wellbeing framework described in Section 1.3 of this report.

Establishing links between the social assessment and the technical assessments is deliberate; they are complementary⁸⁵. This allows for the integration of local knowledge and specialist technical expertise into the resulting assessment of potential social effects.

Use is occasionally made of individual comments from those interviewed during the assessment. This is done to highlight the social nature of the analysis and should not be taken to infer that the views of only a few people have unduly influenced the analysis and conclusions.

⁸³ Because they have been demonstrated through the visual simulations prepared by Boffa Miskell Ltd - refer Volume III of the AEE.

⁸⁴ Refer to the Noise Assessment carried out by Hegley Acoustics - see Appendix 5, Vol.II of the AEE.

⁸⁵ This is not done in order to assert specialist technical expertise on the part of the social assessment team, but rather to ensure coherency. It must be remembered, however, that the technical assessments and the social assessment have been undertaken using their own unique analytical frameworks and methods.

4.3 Visual Impacts

Source of effects, potentially affected people, and concerns expressed:

The primary source of visual effect will be the presence of up to 100 wind turbines in the landscape, occupying places in familiar views. In contrast to the substantial changes in views and landscape which have occurred gradually in this locality with land use change over the past few decades, the wind turbines, which will be visually prominent from some locations, will appear relatively suddenly in their full extent, over the course of approximately two construction seasons.

There are approximately 60 permanently occupied dwellings in the immediate visual catchment of the wind farm. Excluding the four properties on which turbines will actually be sited, it appears that the closest permanently occupied farm dwelling is about 2 km from the nearest part of the proposed development envelope (along Eldorado Track) and that there are 3 dwellings⁸⁶ within 2.5 km of the development envelope and 7 dwellings⁸⁷ within 5 km of the development envelope. The remaining 50-odd dwellings are at distances of between 5 km and 17 km from the development envelope.

Those who visit occasionally and temporarily include crib owners at the Lake Mahinerangi fishing village⁸⁸, those choosing to visit Te Papanui Conservation Park, a few hunters, tourists travelling to or from Middlemarch by road, or along the Old Dunstan Road, and people taking part in occasional organised events such as the Cavalcade or multi-sport events.

Responses from residents in the host community to the wind farm's widespread effect on visual and scenic qualities of the area differ across the spectrum - as Dr Boffa notes at para. 10.2.1, from "visually appealing" to "out of character". Such differences are hardly surprising, given that people's general disposition is known to be similarly diverse⁸⁹.

In the case of those interviewed in the host community, there was a corresponding contrast between adverse and positive expectations from the proposed wind farm. Adverse effects were described in terms of amenity loss resulting from the wind farm dominating and intruding on views - "*a blot on the landscape*"; "*our whole vista will be taken up with turbines*"; "*our view will be destroyed*". Others described changes as "*losing our sense of isolation*" and "*adding an industrial look to the beauty of the area*". Those with a neutral stance on potential visual effects were inclined to make observations such as "*no worse than the pylons we see at the moment*" or "*not a problem; not really in my back yard*". Some residents of the immediate host community acknowledged the potential enhancement of visual amenity values with descriptions such as "*sculptural and beautiful, when in the right place*"; "*spectacular*"; "*visually compatible*"; "*personally like the look of the turbines*". Another made the link to social contact - "*people will come to visit me just to look at the wind farm*".

⁸⁶ Including the dwelling at 2 km distance; all dwellings on farming properties to the south and east of the development envelope.

⁸⁷ Including the 3 dwellings within 2.5 km; includes two dwellings in the Lake Mahinerangi fishing village and one dwelling on the south side of Lake Mahinerangi.

⁸⁸ Of 35 cribs, 3 were permanently occupied at the time of this assessment.

⁸⁹ see Tables 4 and 5 in Appendix 3.

Two related issues were raised in discussion, which have a bearing on local responses to the potential for visual effects. At least half the local residents interviewed expressed concern about the potential for precedent effects in future and the risk that the establishment of one wind farm in their locality could open the door to others being established within an overlapping viewshed, for example another wind farm on the Maungatuas and one near Hindon or Middlemarch. Conversely, some local residents acknowledge that they live with a highly modified view already - with gorse, broom, transmission lines, exotic trees, improved pastures, and so on. One of the features of the existing landscape when the Eldorado Ridge is viewed from most parts of the immediate host community is that it is overlain with numerous signs of human habitation, implying that landscape change actually has a considerable degree of acceptance in the local community. Indeed, most of the landscape change over the past few decades has been driven by decisions of individuals in the local farming community. Dr Boffa confirms this at para. 10.4.1 and notes in 10.4.4 that "views in general are not specifically protected in the District Plan or indeed in the RMA."

While some local residents expressed the view that the change in the character and quality of the local landscape resulting from the wind farm is likely to deter recreational or tourism visitors, this expectation is not shared by those in the tourism and recreation sector itself. Almost without exception, they consider that the presence of the wind farm will, if anything, provide an additional source of attraction or interest for those who are already considering visiting the area for other reasons.

Technical assessment of visual and landscape effects:

The technical assessment of visual and landscape effects has been carried out by Boffa Miskell Ltd and reported in Volume III of the AEE. Dr Boffa points to a number of factors to consider in assessing the potential significance of visual effects. These include -

- views from dwellings,
- dwelling orientation,
- visual screening,
- separation distance,
- the scope for alternative views,
- the scope for mitigation;
- the overall balance between natural and 'man-made' features in the landscape;
- the difference between being 'industrial in nature' and the 'built environment' or 'urban infrastructure' in terms of density and bulk; and
- the importance of distinguishing visibility from visual effect,
- the reversibility of wind farm development.

The visual assessment sets out ten assessment criteria (Vol.II p.23). The conclusions (Vol.II pp.43-45) have been taken into account in the following assessment of social impacts.

Assessment of social impacts:

In a social analysis, it is also relevant to consider the additional factor of dwelling occupancy (permanent residence versus occasional occupation).

Despite the fact that several wind farms have been operating in New Zealand for a number of years, there is little surveyed information of the actual experiences of people who live in the vicinity of such developments.

In 2005, Taylor Baines and Associates conducted a series of Rapid Appraisal interviews with 54 residents of Ashhurst, all between 2 km and 3 km from the nearest turbines on the Te Apiti wind farm⁹⁰, and with 17 rural residents in closest proximity to the Tararua wind farm⁹¹ or Te Apiti wind farm, at distances ranging from 2 km to 5 km from the nearest turbines.

Of the latter group, not one person responded that being able to see the turbines from their properties had had a negative impact on them. Nine (out of 17) indicated that they found the impact pleasant⁹², four indicated no impact at all, and four indicated mixed impacts⁹³. This finding suggests no adverse social impacts have been consequential upon the visual effect, either at an individual household level or at a community level.

To the extent that proximity (separation distance), house orientation, visual screening and topography influence visual impacts, Mahinerangi compares favourably with other existing wind farms - notably Te Apiti and Tararua; separation distances at Mahinerangi are generally greater; indeed the number of dwellings in the immediate visual catchment are substantially fewer, and the dwellings within 2-5 km of the wind farm boundary number in single figures.

Some residents in the immediate Mahinerangi host community may continue to find the visual presence of a wind farm intrusive and objectionable and see this as a loss of their environmental amenity. There appear to be no dwellings nearby (outside the participating properties) where the turbines will be the single visually dominant feature⁹⁴. Two households will experience a substantial change to the main views from their dwellings (see Viewpoints A and B)⁹⁵. These findings are confirmed by Dr Boffa at para.10.7.2. In the latter

⁹⁰ The Te Apiti wind farm was built and is operated by Meridian Energy Ltd to provide electricity into the national grid

⁹¹ The Tararua wind farm (Stages 1&2) was built by the Palmerston North lines company to supply Palmerston North customers, and sold to TrustPower Ltd who now operate the wind farm.

⁹² 'Pleasant' impacts were described in comments such as *"Look at them every morning, gives me useful info about wind direction and strength"*; *"Look good with evening and morning light"*; *"Tranquil to watch and movement adds a dimension"*; *"Interesting to look at - good to know wind direction"*; *"Calming to look at"*.

⁹³ 'Mixed' impacts were described in comments such as *"Not my favourite thing to look at but they're eco friendly"*; *"Not indifferent; negative - can't ignore them; positive - interest, intrigue, something happening there"*; *"They are 'mystical' - prefer to look at them then nuclear plant"*.

⁹⁴ As described in the first bullet point under para. 10.12.1 of Vol.III in the AEE.

⁹⁵ Viewpoints A and B are taken from dwellings on Mahinerangi Road owned by the Reids.

case there is scope for localised mitigation (or partial mitigation) over time with screen planting if the occupants decide that is preferable.

At a community level, as represented when the wind farm is viewed from various public viewpoints such as Viewpoints 11, 12, 13 and 22, in the Boffa Miskell Ltd assessment, it will be an additional element in the community-wide landscape, but not the dominant element, since by and large in these views it appears against a landform backdrop, rather than above the horizon. In this context, the presence of the wind farm will alter the identity of the locality, but not necessarily in a negative manner. While some people will focus on the negative associations with 'industrial activity', others will focus on the positive association with sculptural form, local renewable energy and the absence of greenhouse emissions. The wind farm will become part of the future identity of the locality and community, incorporating both these sorts of associations.

In summary, the visual effects of the wind farm are unlikely to result in established residents leaving - the farming community is well established; it is most unlikely to have any effect on the level of resident population, which has been in gradual decline for some time, due to the viability of farming. To the extent that the proposed wind farm adds to the economic viability of several farming properties, it will help to sustain these farming enterprises and those who rely on them for their livelihoods.

If experience in Manawatu is any guide, the advent of a wind farm in the area is likely to provoke the curiosity of recreationists and tourists, at least for a while. For such visitors, views of the wind farm are intermittent and ever changing as they move through the area. For those who wish to avoid views of the wind farm, the locality (including Te Papanui Conservation Park) will continue to provide extensive opportunities which are not affected adversely by the presence of this wind farm, as confirmed by Dr Boffa at paras 10.5.2 and 10.5.3.

The presence of the wind farm is unlikely to detract from the main water-based recreational pursuits of day trippers or crib owners making occasional and short-term visits to the Lake.

Expectations that a wind farm on Eldorado Ridge will become a primary destination in its own right must be tempered by considerations of relative remoteness, the quality of the road infrastructure and the fact that wind farm land continues to be in private ownership and used for farming purposes. As a pattern evolves over time, mitigation measures can be considered, if necessary, in terms of the location of signage, interpretive materials and off-road parking and viewing areas (refer to Section 15 of Traffic Design Group's assessment). It is more likely that casual visitors would follow the SH87 to viewing points in the vicinity of Clarks Junction because of ease of driving conditions and because it could be part of a round trip to Middlemarch. The possibility of organised public access to the wind farm during occasional 'open day' fund-raising events has been discussed with Lee Stream School.

4.4 Noise Impacts

Source of effects, potentially affected people, and concerns expressed:

The noise source that is of concern to many of those interviewed is the noise from operating turbines associated either with mechanical parts such as gearboxes and generator units

housed in the nacelles or aerodynamic noise associated with movement of the blades through the air.

The people who have expressed concern at the prospect of being disturbed by turbine noise are the closer farming neighbours and permanent residents around Lake Mahinerangi, as well as representatives of the crib owners at the Lake, who visit their cribs on an occasional and temporary basis. This is a somewhat more restricted set of people than those potentially affected by visual effects. By their nature, noise effects are more proximity dependent than visual effects.

People who choose to visit the locality for recreation or pass through it as tourists are unlikely to consider themselves affected by any turbine-related noise they might hear if they venture close enough to the wind farm.

As noted in the Section on Visual Effects, there are approximately 60 permanently occupied dwellings in the visual catchment of the wind farm. Excluding the four properties on which turbines will actually be sited, it appears that the closest permanently occupied farm dwelling is about 2 km from the nearest part of the proposed development envelope (along Eldorado Track) and that there are 3 dwellings⁹⁶ within 2.5 km of the development envelope and 7 dwellings⁹⁷ within 5 km of the development envelope. The remaining 50-odd dwellings are at distances of between 5 km and 17 km from the development envelope. The fishing village at 4.7 km from the nearest turbine has 33 cribs which are occupied only on an occasional basis.

Discussions with host community residents during this assessment almost universally focussed on the issue of uncertainty about potential noise effects - *“will we hear them?”*; *“would be a problem if we were interrupted by turbine noise?”*; *“at what distance can I expect to hear them?”*

The uncertainty expressed by interviewees reflects the view that potential social consequences arising from any actual noise nuisance - should it occur - would be seen as serious in terms of personal health and the quality of the living environment and working environment - *“we wouldn’t want our sleep disturbed, or to be disturbed outside when entertaining”*; *“we don’t want to have to keep our windows closed”*; *“we’re so used to the peace and quiet in this rural area”*; *“would be an issue if we heard it from the house or while out working”*.

Three related issues were raised in discussion, which have a bearing on local responses to potential noise effects. Firstly, unlike visual simulations, noise modelling is technical and more difficult for lay people to interpret. Secondly, residents have difficulty reconciling potentially conflicting information. On the one hand, interviewees said that TrustPower representatives or the noise consultant do not deny that they may hear something some times, but what and how often is not clear, while others have heard extreme stories from Ashhurst and Woodville that do not help to ease their anxiety. Thirdly is the issue of what can be done after the event - *“we’re never going to know for certain until you’ve got the wind*

⁹⁶ Including the dwelling at 2 km distance; all dwellings on farming properties to the south and east of the development envelope.

⁹⁷ Including the 3 dwellings within 2.5 km; includes two dwellings in the Lake Mahinerangi fishing village and one dwelling on the south side of Lake Mahinerangi.

farm there, and what can you do then?"; "what can TrustPower do about it if we do end up hearing them?"

Technical assessment of noise effects:

The technical assessment of noise effects has been carried out by Hegley Acoustic Consultants and reported in Appendix 5, Volume II of the AEE. Mr Hegley points to a number of factors to consider in assessing the potential significance of noise effects. These include -

- separation distance, since noise abates with distance,
- the typical pattern of wind direction⁹⁸,
- contributions to the existing noise environment, particularly from farm activities and wind generated noise;
- the relationship between wind speeds at the proposed wind farm site and background noise levels at potentially affected residences;
- the influence of wind direction and different wind conditions between the wind farm site and the receiving site; also the fact that higher noise levels are received downwind than upwind;
- the sound power from wind turbines reaches a maximum at wind speeds of just over 9 m/s; sound power levels reduce at wind speeds less than 9 m/s and also at wind speeds greater than 9 m/s;
- during calm weather conditions (at wind speeds of less than 2.5 m/s) the turbines will be either stationary or will idle without generating any power. Under these conditions which coincide with the minimum noise environment, there will not be any noise from the turbines;
- in high wind speeds (equal or greater than 25 m/s), turbines are shut down to prevent possible damage to the equipment.

The technical assessment addresses the requirements of NZS6808:1998 Acoustics - The Assessment and Measurement of Sound from Wind Turbine Generators. It also notes the general duty to avoid unreasonable noise expressed in section 16 of the RMA. The conclusions of the technical assessment (p.38) have been taken into account in the following assessment of social impacts.

Assessment of social impacts:

In a social analysis, it is also relevant to consider the additional factor of dwelling occupancy (permanent residence versus occasional occupation), an individual's sensitivity to noise, and the likely frequency of occurrence of circumstances that even have the potential to create adverse effects since any noise effects are intermittent in character.

As noted in the Section on Visual Effects, in 2005 Taylor Baines and Associates conducted a series of Rapid Appraisal interviews with 54⁹⁹ residents of Ashhurst, all between 2 km and 3 km from the nearest turbines on the Te Apiti wind farm, and with 17 rural residents in closest proximity to the Tararua wind farm or Te Apiti wind farm, at distances ranging from

⁹⁸ Mr Hegley has incorporated a set of wind rose data for the area (see Fig.21, p.32) which demonstrates that for over 50% of the time, the wind blows from the 240°-300° sector (i.e. westerly quarter).

⁹⁹ Of the 54 people interviewed, 49 lived in the contiguous, built-up area of Ashhurst at distances of between 2.5 km and 3 km from the nearest turbine in Te Apiti, while 5 lived along River Road, a rural road on the river terrace east of Ashhurst at a distance of 2 km from the nearest turbines.

2 km to 5 km from the nearest turbines. (Refer to Appendix 4 for a summary of survey results.)

At a similar time¹⁰⁰, a resident of Ashhurst¹⁰¹ carried out another survey of town residents enquiring, amongst other things, about their experience of noise effects. Although the people targeted in these Ashhurst surveys all lived in a more urban setting¹⁰², the responses are instructive because the respondents all lived between 2.5 km and 4 km from the nearest turbines at the Te Apiti wind farm. Also, there is a high degree of agreement between the two sets of results, which are set out in Table 4 of Appendix 4.

Given the locations of dwellings in the Mahinerangi case, their relatively small numbers in close proximity, and the reported experience elsewhere in the country, there is not a high probability that rural residents neighbouring the proposed Mahinerangi wind farm will experience adverse effects and social consequences as a result of noise from the turbines. The distribution of wind directions, the separation distances to dwellings in the downwind direction and the widespread existence of trees providing some degree of wind shelter militate against this.

There is no doubt that uncertainty about potential noise impacts creates a degree of anxiety, and that is what a number of residents have expressed already, at the prospect of a wind farm nearby. The actual experience of intrusive noise would be more likely to cause people to move out of an area than the actual experience of visual effects.

In the case of the Mahinerangi proposal, Mr Hegley is confident that the turbine noise levels generated by the maximum number of turbines of the maximum size will meet the requirements of the NZ Standard¹⁰³ "with a factor of safety" (p.38).

Mr Hegley notes the requirements to monitor noise under NZS6808: 1998 in order to verify the findings of the noise modelling undertaken for the technical assessment or for investigating noise complaints if they should arise. Such monitoring is indicated by Mr Helgey (pp.35-36). Given the degree of anxiety which has been expressed, this is an appropriate measure.

Because of the relatively low density of rural settlement in this area, it is very unlikely that off-site noise effects will have any effect on overall population trends and community viability.

¹⁰⁰ The two surveys were carried out within three months of each other - Shepherd (January 2005) and Taylor Baines (April 2005).

¹⁰¹ Dr Mike Shepherd, senior lecturer in the Geography Department of Massey University, Palmerston North.

¹⁰² Ashhurst is a township of some 1,000 dwellings, situated just over 10 km north-east of Palmerston North, near the western entrance to the Manawatu Gorge.

¹⁰³ NZS6808:1998, Acoustics - The Assessment and Measurement of Sound from Wind Turbine Generators.

4.5 Construction Impacts

As noted in Section 4.2 the potential effects due to the presence of construction traffic over two seasons of construction activity appear to be the most universal source of concern for people living locally. These include the potential for social effects associated with travel delays, experience of road safety, levels of dust nuisance, conflicts with traditional movements of farm stock along rural roads, and the risk of construction vehicles carrying in unwanted weeds and seed sources.

It is worth noting however that interviewees' comments generally reflected the view that such potential traffic-related effects are amenable to satisfactory mitigation to a considerable extent.

The technical assessment of traffic effects has been carried out by Traffic Design Group (TDG) and reported in Appendix 4, Volume II of the AEE.

Travel delays and road safety:

Source of effects, potentially affected people, and concerns expressed:

The risk of travel delays and potential effects on the safety of other road users arises because heavy traffic generated during the construction phase will increase existing heavy traffic volumes¹⁰⁴ on local roads (refer TDG, 9.2.1, p.29).

Combined with established behaviour of existing road users¹⁰⁵ and their experience of heavy vehicles, this leads to concerns over the potential for delays and the potential for increased levels of hazard. The concerns expressed relate particularly to situations in the vicinity of 'blind corners' and in dry conditions when vehicles generate clouds of dust, sometimes making it necessary to drive at much slower speeds.

To some extent, the potential exists for all users of Mahinerangi Road and Black Road Road/Lee Flat Road to experience the increase in traffic numbers along these local roads. However, the issue as expressed by local residents does not appear to be one of road capacity constraints; rather it is about the potential for occasional situations of traffic conflict

¹⁰⁴ At present, Mahinerangi Road carries between 50 and 95 vehicles per day (TDG, Table 1, p.11), of which 10 were recorded as heavy vehicle movements (TDG, section 3.3, p.13). If all the heavy vehicle traffic generated by the wind farm construction travelled along Mahinerangi Road, this would add, on average, a further 70 heavy vehicle movements per day. If hard fill, base-course and aggregate are sourced from a quarry on Black Rock Road, then heavy vehicle movements along Black Rock Road and Lee Stream Road would typically increase by 32 per day, reducing the increase in heavy vehicle traffic along most of Mahinerangi Road by the same number.

¹⁰⁵ The Traffic Assessment (Section 9.2.2) notes that drivers on unsealed roads typically position their vehicle within the carriageway based on their perception of the risk of conflict with approaching vehicles, and their ability to react where necessary. At lower volumes, this leads to vehicles tracking closer to the centre on straighter sections of road where the forward visibility is good, tracking to the left when forward visibility is limited, and tracking along the shortest path on bends where visibility is good. Numerous interviewees confirm the tendency of drivers to track towards the centre of local roads to avoid deeper drifts of metal, a condition which tends to discourage overtaking as well.

and risk to arise, and the greater risk to the occupants of smaller vehicles in conflict situations with heavy vehicles.

The existing traffic pattern on these local roads is anything but uniform over time. The greatest likelihood for situations of traffic conflict and risk to arise is during the relatively busier time of the day. By implication, those most likely to be affected are the commuters living at Lake Mahinerangi, Eldorado Track and Settlement Road and the 13 children living along two affected school bus routes, their bus drivers who have responsibility for their safety, and the rural delivery driver - all most likely to be on the local roads before 8.45 am. With the increased frequency of heavy vehicle movements, regular road users could encounter several additional heavy vehicles every day¹⁰⁶.

Technical assessment of travel delay and road safety effects:

The Traffic Design Group adopted a Level of Service approach to assessing road capacity. Their report points to a number of factors to consider in assessing the potential significance of traffic effects. These include -

- the section of route on SH87 from Outram to Lee Stream is of a standard that provides safe and efficient traffic carrying capacity well above the existing traffic volumes;
- Mahinerangi Road forms part of the Clutha District's heavy vehicle network as defined by the District Plan¹⁰⁷;
- limited research is available that indicates whether there is potential for a reduction in road safety as traffic volumes increase on rural unsealed roads with low traffic volumes;

- parts of Mahinerangi Road and Eldorado Track will require geometric improvements to accommodate the over-dimensioned vehicles¹⁰⁸; these changes will improve carriageway width and forward visibility;
- it is appropriate to consider how the requirements of Land Transport (Road User) Rule 2004¹⁰⁹ can be encouraged during the construction period;
- consultation with the school has identified that they have a concern that the safe operation of the school bus and safety of children waiting for the school bus will be adversely affected by the construction traffic. On the unsealed sections of road this may include the potential for dust and stones being thrown up by the trucks.

Traffic Design Group concludes (Section 17, p.56) that construction traffic will result in minor inconvenience to a small proportion of road users over a limited period of time, and that improvements to the local roads will have a positive long-term impact.

¹⁰⁶ Both drivers of the school bus and rural delivery service noted that they encounter heavy vehicles every day, even at present vehicle frequencies.

¹⁰⁷ Traffic Assessment, Section 8, p.28.

¹⁰⁸ Figure 14 of the Traffic Assessment shows 24 locations on Mahinerangi Road and 19 locations on Eldorado Track

¹⁰⁹ eg. keeping left, maintaining safe following distances, driving at speeds appropriate to the available stopping distances, and only overtaking where safe to do so.

Assessment of social impacts:

The potential for delay through occasional disruptions may give rise to more risk taking by some drivers, particularly in situations when people have fixed deadlines to meet, such as arriving at work on time or arriving at school on time; that is to say, generally in the mornings. The potential consequences of delay include longer travel times, adverse repercussions for lateness at work or school, or accidents. These risks are of concern to the rural residents of the host community. This concern reflects the significance of road-based mobility in terms of access to services and social connectedness for people living in relatively isolated rural areas.

At the community level, the risk to be avoided or reduced is the risk, however slight, that experience of such adverse effects and the prospect of the situation continuing over a period of two years could result in people who have chosen to live in the rural host community area and commute to work in places like Lawrence, Outram, Mosgiel and Dunedin being sufficiently discouraged to stop commuting or leave the community altogether. If this involved the loss of primary school children from the area, even temporarily, it might have further implications for Lee Stream School, although these might possibly be offset by new arrivals occupying the same rented dwellings.

However, these risks can be mitigated.

Traffic Design Group recommends the development and implementation of a Construction Traffic Management Plan (CTMP) to mitigate against occasional disruptions. Specific measures anticipated could include -

- advice to all construction-related drivers to enable following vehicles to pass safely, and general driver education in courteous driving practices;
- providing road users with information relating to expectations of traffic volumes at varying times;
- that a safe and comfortable driving surface be maintained (equivalent to the road surface condition immediately prior to the commencement of construction), and also ensuring the unsealed surface close to the carriageway is well maintained for regular use;
- the provision of temporary signage indicating the presence of heavy vehicles;
- the provision of in-vehicle radio systems (extended to include the school bus and the forestry trucks) to enable positions on the road network to be identified.
- minimising heavy vehicle movements during times when the school bus is operating.

In the context of this SIA, these measures are positively endorsed. Traffic Design Group acknowledges that the construction traffic route is used by a wide range of road users. Consequently, one further element of mitigation is recommended to complement the above: the establishment of a Community Liaison Group¹¹⁰ as a mechanism for local community input to the Construction Traffic Management Plan and the process of adaptive management implied by this.

¹¹⁰ Note that this form of mitigation is appropriate for addressing other potential social effects and issues, as discussed elsewhere in the report.

Dust nuisance and related risks:

Source of effects, potentially affected people, and concerns expressed:

Vehicles on unsealed roads in dry conditions generate dust, which under windy conditions is experienced as travelling for several hundred metres downwind. The increase in vehicle numbers during the construction period will increase the incidence of dust-generating events.

Three aspects of concern were expressed by the residents interviewed. People living in dwellings near the construction routes¹¹¹ may experience occasional episodes of nuisance due to dust blowing into outside living spaces, through open windows or onto washing hung outside, when wind is strong enough and blowing from a particular direction. There is the potential for occasional loss of residential amenity and in extreme cases an impact on people with respiratory conditions.

Whenever it is dry and windy, dust generated by passing traffic will be deposited on adjacent pastures¹¹². Several farmers interviewed for this assessment raised the issue of the potential to affect pasture growth and animal productivity, if sufficient dust accumulates.

Road users experience dust clouds at close quarters, requiring drivers to slow down¹¹³ in the interests of safety. This can occur especially when there is little or no wind.

Technical assessment of traffic-related dust nuisance effects:

The TDG assessment focusses on the driver safety issue and acknowledges (p.31) that additional construction related vehicles on the unsealed roads have the potential to generate dust that may reduce driver visibility. TrustPower has subsequently engaged Kingett Mitchell to undertake further expert assessment of potential dust nuisance effects, the results of which will be taken into consideration in finalising this assessment.

Assessment of social impacts:

The consequences for visibility are one factor contributing to the potential for travel time delays, as well as the more immediate implications for safety. However, these will be addressed for the most critical situations through the mitigation suggested previously. In this regard, TDG states (p.31) that if reduced visibility as a result of dust does become an issue at times of higher site traffic generation, it is recommended that contingency measures be incorporated in the Construction Traffic Management Plan such as dust suppression

111 About five households along Mahinerangi Road and Eldorado Track; two households in permanently occupied dwellings in the Fishing Village at Lake Mahinerangi. There are no dwellings along the unsealed section of Lee Flat Road which do not have substantial screening by established trees.

112 About 7 farming properties along Mahinerangi Road and Eldorado Track, and another couple of farming properties along the unsealed section of Lee Flat Road.

113 One of the school bus drivers reported the need to stop completely on occasions in order to wait for the return of safe driving conditions.

methods¹¹⁴. It is recommended that this would be a matter for Community Liaison Group consideration.

Para 5.9.3 of Vol.I of the AEE (p.84) notes that dust control measures, in accordance with best-practice approaches, will be put in place throughout the construction activities.

Conflicts with the movement of farm stock:

Source of effects, potentially affected people, and concerns expressed:

Since some farming properties are not contiguous parcels of land or are divided by local public roads, farmers move mobs of sheep or cattle along the roads or across the roads from time to time as an integral part of their grazing management. Farmers expressed concern that the potential for conflict over the movement of farm stock along local roads may affect their autonomy in the way they manage their farming enterprises. Six farmers interviewed confirmed that sheep become extremely agitated when heavy vehicles move past them. The presence of heavy vehicles associated with construction is likely to increase the frequency of such incidents occurring. Farmers concerns are associated with the consequent potential for incurring individual costs in maintaining and repairing fences and stock yard infrastructure damaged by agitated stock.

It should also be noted that there is considerable potential for travel time delays for the construction vehicles, if the issue is not managed constructively. Thus it will be in the interests of all parties through the Construction Traffic Management Plan to minimise the potential for conflict.

Technical assessment of travel delay and road safety effects:

TDG's report acknowledges (p.32) that several farmers have expressed their concern about the effect that increased traffic volumes related to construction activities may have on their ability to continue their practice of moving stock along the road carriageway¹¹⁵. The report notes Local Authority expectations for the use of public roads for moving farm stock and points out the degree of mutual interest amongst all users of the road reserve in minimising situations of conflicting use, a principle acknowledge by all the farmers interviewed.

Assessment of social impacts:

While the consequences of potential conflict over stock movements are not necessarily trivial for farmers who will be affected, in terms of added complications to farm management responsibilities and the risk of damage to fences, the frequency with which it is likely to occur need not be great if the issue is managed properly. Indeed, some stock movement is for winter feed management and may therefore occur when construction has been halted or reduced for the winter.

¹¹⁴ TrustPower's AEE document (at Section 5.5.2) refers to 'the dampening of roads through the use of water tankers'.

¹¹⁵ From the interviews, it appears that up to three farmers with land along Mahinerangi Road, one farmer with land along Eldorado Track, and three farmers with land along Black Road/Lee Flat Road have established patterns of moving their stock across or along various stretches of local roads.

TDG envisages further consultation with farmers over these matters as part of developing the Construction Traffic Management Plan. Mutual co-operation and negotiation to minimise inconvenience and cost to either party would most likely involve agreements over timing of stock movements and scheduling of vehicle movements. A local precedent for this kind of arrangement already exists in the form of an established informal local protocol by which farmers keep their stock off the roads to avoid delays for the school bus and rural delivery vehicles. Effective lines of communication will be essential, and are incorporated in general mitigation measures mentioned elsewhere in this report.

Given the finite time period over which construction occurs, there has been no suggestion by farmers that this is a significant risk to farm viability.

4.6 Other potential construction-related effects

A number of other construction-related effects were raised as concerns during interviews for this assessment. They include the visual aspects of earthworks potentially affecting views from neighbouring farming properties; risks from earth disturbance to water quality in streams which rise on the Eldorado Ridge potentially impacting on use of these streams by several farmers for stock water; the risk of introducing more weed sources and thereby potentially increasing weed control costs to several neighbouring farmers, and the risk of tussock fires associated with construction activities or the presence of construction workers or maintenance workers.

These potential effects have been addressed in other technical assessments and by mitigation offered by TrustPower, as noted in the following brief summaries.

Visual effects of construction earthworks:

Dr Boffa concludes in his assessment (para.5.3, p.14), that 'given the rolling and relatively flat nature of the landforms within the wind farm envelope, and the siting of the access tracks on ridges and spurs, the physical and visual effects of earthworks and the appearance of the tracks following landscape rehabilitation will be no more than minor.'

Risks to water quality in streams:

Concern was expressed that construction activities will adversely affect streams by introducing sediment and thereby impairing their use for stock water purposes, adding to individual farm costs and stock management requirements.

The Kingett Mitchell assessment reports previous research which indicated that periods of increased sediment loadings in the pasture streams were attributable to stock damage and associated bank erosion (AEE Vol. II, Appendix 3, p.34). They note (p.54) the potential risks of construction-related sediment moving into watercourses, but conclude that standard best-practice design and proposed mitigation, along with downstream monitoring of construction and fill site discharges particularly following rain events, will be minor or less than minor.

Previous interviews with three of the four landowners involved in Meridian Energy's Te Apiti wind farm in Manawatu, as well as the Compliance Team Leader for Horizons¹¹⁶ without

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Horizons is the Manawatu Wanganui Regional Council.

exception confirmed their complete satisfaction with the high standards of construction management¹¹⁷ and the absence of any significant off-site effects.

Risk of introducing more weed sources

Several local farmers expressed concern over the risk that gorse and broom seeds might be carried from the verges of Lake Mahinerangi by trucks carting water to the concrete batch mixing plant, because of the potential to create additional weed control costs for them.

This risk may be avoided altogether, or substantially reduced, since application has also been made by TrustPower to obtain water for concrete-making purposes from the Deep Stream diversion which TrustPower is presently constructing, thus providing an alternative source of water. Further relevant mitigation measures already committed to by TrustPower (Vol.I, p.iv) include the implementation of standard best practice to minimise weed invasion and a commitment to monitor, and where required control weeds for four years after construction is completed.

The increased risk of tussock fires:

Several farmers mentioned the existing risks in isolated locations from tussock fires which can occur spontaneously¹¹⁸. Their concern was that the risk of such tussock fires will be increased by the presence of greater numbers of people on site, the earth-moving activities during construction, or the presence of electrical components in the operating wind farm. The AEE¹¹⁹ notes that similar concerns have been expressed by the Department of Conservation.

The AEE further sets out TrustPower's response in terms of developing and implementing a Fire Management Plan, in consultation with relevant fire experts and the Department of Conservation and prior to construction commencing. As part of this Fire Plan, permanent site personnel will be trained in fire responsiveness while all personnel entering the facility will be provided with fire safety information. Consequently, it could be argued that overall the fire risk will even be reduced, due to the regular presence of trained personnel offering a greater degree of surveillance for fire risks than currently exists, and the presence of water storage on site during construction activities. The existence in the immediate vicinity of the wind farm site of the Deep Stream reservoir will provide further resources for fire fighting in the long term.

¹¹⁷ In the case of land slippage and sediment run-off, the construction management was described as 'exceptional', noting the extreme storm events which occurred during the construction period in February 2004, remembered for the devastating floods experienced in the Manawatu.

¹¹⁸ In other words, even without human intervention, as a result of natural causes in situations where ungrazed or lightly grazed snow tussocks have grown very large.

¹¹⁹ At Volume 1, Section 5.9.2, p.83.

4.7 Social division and community engagement issues

During the host community interviews for the SIA, issues were raised about the process of community engagement experienced so far and about a perceived imbalance in the distribution of benefits and costs within the immediate host community and the way this has resulted in tensions within the host community. These issues are summarised here because they have a bearing on the tenor of individual and community responses to this proposal.

TrustPower's consultation process:

TrustPower has devoted substantial time and resources to consulting a wide range of interested parties since December 2005. TrustPower's consultation process is described in detail in its AEE documentation¹²⁰. The consultation process has been programmed over several phases between December 2005 and December 2006 and targeted regional and district-level agencies, local landowners and crib owners and a variety of other groups and organisations with potential interests in the proposal, as well as members of the wider regional community.

Consultation activities involved letter mail-outs, distribution of information brochures, phone calls to stakeholders¹²¹, stakeholder meetings and associated site visits, public information and consultation evenings, and the circulation of draft technical reports¹²². Since the revised applications were lodged, TrustPower has held four further public information and consultation evenings¹²³.

Throughout this period, TrustPower has adopted an 'open door' policy, under which anybody who wished to discuss any aspect of the proposal has been welcome to contact any member of the TrustPower team, as well as the technical experts engaged for the project.

Continuing its programme of consultation, TrustPower has already initiated consultation on the details of a Construction Traffic Management Plan, which it intends presenting at the hearing.

Community engagement issues:

Many members of the immediate host community who were interviewed do not believe they have been engaged as a community; rather they have been dealt with as individuals or individual households¹²⁴.

¹²⁰ AEE Volume 1, Section 4.

¹²¹ Detailed in Vol.1, Section 4.2.2

¹²² Detailed in Vol.1 Section 4.2.3

¹²³ Detailed in Vol.1 Section 4.2.4

¹²⁴ We note that TrustPower did hold joint meetings on several occasions with several related households.

The fact that some local residents perceive there has not been real community-level engagement so far has polarised some sections of the community¹²⁵ and polarised attitudes to the proposal. This has engendered a degree of negativity towards the proposal that probably would not otherwise exist. These kinds of community responses have been encountered elsewhere, both in New Zealand¹²⁶ and abroad¹²⁷.

Social division:

The perception amongst some local residents that the benefits and costs of the proposed wind farm are distributed unevenly within the host community is a factor which exacerbates local polarisation and leads to a degree of social tension and division.

The proposed wind farm project will provide certain and recognisable financial benefit to a few local households¹²⁸ as well as benefits to thousands of electricity-consuming households in the region, household income for 140 individuals in the regional construction and services labour market, and on-going household income for eight individuals maintaining the wind farm. Even though some local households may benefit in other ways, such as house rental income during construction, permanent roading improvements, and fund-raising opportunities for the Lee Stream School, the nature and extent of these possibilities is less evident or less certain, and their distribution amongst local households also uneven.

Social divisions and tensions have become evident in both private and public settings, as reported during the interviews. These involve cases of strained inter-personal relationships amongst families, friends and neighbours. There have also been occasions when the conflicting attitudes and positions of parents have been voiced by children at the Lee Stream School, creating undesirable tensions in that setting. In a more public way, some have formed new alliances, as in the case of the Upland Landscape Protection Society, but the host community as a whole is by no means unanimous in support of this group.

¹²⁵ As evidenced, for example, in the formation of a group such as the Uplands Landscape Protection Society, with its varying degrees of support or opposition locally.

¹²⁶ Berg, C 2003. Minimising Community Opposition to Wind Farm Developments in New Zealand: Opportunities in Renewable Energy Planning. Msc Thesis in the Institute of Geography, Victoria University of Wellington, June 2003.

¹²⁷ Cited in Damborg, S 1998. Public Attitudes Towards Wind Power. Danish Wind Industry Association: A 1996 study by Wolsink found *“that people in areas with significant public resistance to wind projects are not against the turbines themselves, they are primarily against the people who want to build the turbines. Often the local people are kept out of the decision making process.”* Another European study by Erps in 1997 reinforced the significance of such process-related issues. Erps concluded that *“the attitudes towards the developer, local decision makers, and the decision process have significant influence on the public attitude towards the project. At the same time the study suggests that a participative approach in the siting procedure has a positive effect on the public attitude towards the project, and thus leads to a decrease in public resistance. What matters is involvement of the local population in the siting procedure, transparent planning processes, and a high information level.”*

¹²⁸ On the basis of turbine-related revenues, the proposed wind farm will provide income to 4 landholders, one of which is Landcorp and a second is non-resident but has a crib on the property. The potential trickle-down effect of this revenue to the local community is therefore relatively small. One other local landholder may gain additional income for several years if rock is sourced from a local quarry.

Not everyone in the local community is concerned about the fact that a few households will earn revenue from the wind farm while the majority will not - but more of those interviewed did express this concern than did not.

In the context of energy projects, wind farms are unusual in respect of the fact that wind farm operators generally do not need to own the land on which turbines are proposed. Typically for 95% of the land involved within a wind farm development envelope, existing land uses can continue as before. Leasing the remaining 5% of the land is therefore common practice. Furthermore, there has never been any expectation under the RMA that applicants are required to benefit financially all individuals or households within a community.

Mitigating social tensions:

Instead of being an adverse social effect, this situation could be remedied and indeed reversed. There is a case for some form of social mitigation to address these challenges to social cohesion in the local community. It should focus on enhancing social capital by establishing a group of representatives of the local community to co-operate over meaningful tasks associated with the project.

The establishment of a Community Liaison Group (CLG) has the potential to benefit the local community in several ways¹²⁹. It would be a new forum for community representation in the rural community, and thus a mechanism for promoting social cohesion. Through its responsibilities and tasks, the CLG also has the potential to ensure good outcomes from the proposed wind farm project for its rural constituencies. Such a Community Liaison Group would comprise representatives of the main interests in the resident Lee Stream/Lake Mahinerangi community, along with the project manager. The primary focus of the CLG would be to provide an active, on-going forum for the exchange of information between the community, TrustPower and TrustPower's construction contractors. Its specific functions could include (1) building effective working relationships and mutual trust, especially during construction; (2) promoting the flow of information in all directions between the parties involved, in order to try to anticipate and resolve any potential issues before they arise; (3) evaluating monitoring activities and results on a periodic basis; (4) overseeing a pro-active Community Complaints Procedure, ensuring appropriate responses are forthcoming, and thereby maintaining the confidence of all parties in the effectiveness of such a procedure.

It can be expected that such a group would meet bi-monthly or quarterly in the early stages of construction. Its participation in completing the initial Construction Traffic Management Plan could be one of its first tasks.

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The value of establishing Community Liaison Group-type arrangements has been demonstrated in several other infrastructure projects in other parts of the country - for example, for the Redvale regional landfill north of Auckland, the Canterbury regional landfill at Kate Valley, north of Christchurch, and the Ashburton District Council's waste water treatment plant. A similar group and process established near Ashhurst at the time of the Tararua 3 wind farm extension has been instrumental in forging a local sense of community and mutual commitment.

5 Summary and Conclusions

At the regional level, there is little doubt over the net benefits to electricity consumers and suppliers of labour, skills and construction services, as described in Section 4.1 and quantified in the economic assessment. For regional tourism and recreational interests, experience elsewhere and local expectations suggest that the presence of the wind farm will provide an additional point of interest, but probably not a major local destination in its own right, as has so far been the case for the wind farms in Manawatu.

At the local level, there will be both benefits and adverse effects. Up to four local households will receive direct financial benefits from the wind farm proposal, a few others may be able to benefit financially during the construction period through providing rental accommodation or construction labour, while Lee Stream School will be able to benefit from an additional source of revenue, based on hosting public 'open days' - a relationship which has been positive in existing wind farm host communities elsewhere. Potential off-site environmental effects - visual and landscape, noise, construction traffic and other construction-related effects - tend to affect different groupings of people and households within the local community, largely dependent on location.

With the mitigation proposed, individual households should be protected from the potential risks of adverse effects. This social impact assessment has recommended the additional mitigation measure of establishing a Community Liaison Group. Experience elsewhere indicates that such a provision is effective in enabling the host community to have a role in monitoring actual effects, keeping the community informed of progress, and responding to project-related issues which may arise for members of the host community from time to time. It is also a mechanism which requires the proponent to engage with local residents as a community.

The effectiveness of mitigation measures often rests upon good communication channels between various interests. For this reason, a number of measures are recommended, covering a range of potential situations, both pro-active and responsive. They include -

- (1) the establishment of a formal Community Complaints Procedure,
- (2) the distribution of a project newsletter throughout the 2RD area,
- (3) identifying the TrustPower Project Manager as the primary local liaison person representing TrustPower and its construction contractors.

It is recommended that a formal Community Complaints Procedure be established, and be subject to audit by the Community Liaison Group. As part of the Community Complaints Procedure, a log will be kept of all complaints which will include the following details: date and time; complainant name and contact details; nature of complaint including cause and effect (if known); and actions taken within 24 hours.

Another measure is recommended to provide timely information to members of the immediate host community. A project newsletter could be used to inform local residents of the timing of forthcoming significant events in the construction programme, and to remind them of the details of other liaison arrangements such as the Liaison Group, Complaints Procedure and contact telephone numbers for project personnel, including the Project Manager.

Comparing the situation of existing wind farm host communities¹³⁰ with that of the Mahinerangi host community supports a conclusion that the proposed Mahinerangi wind farm will not have adverse social consequences at a community level. With risks managed in the manner recommended, it is unlikely that off-site effects will result in population loss. The school's financial resources should be strengthened and the social capital of the local community enhanced by the workings of the Community Liaison Group.

With the combination of regional benefits, local benefits and other local mitigation measures, including arrangements for actively involving members of the immediate host community in a role which incorporates elements of monitoring and adaptive management, this project can be viewed as enabling local and regional communities to provide for their social well being. That is to say, the project will deliver net social benefits to local and regional communities.

¹³⁰ The rural community along Fitzherbert East Road at distances between 2 km and 5 km adjacent to the Tararua wind farm and the urban community of Ashhurst at distances between 2 km and 4 km adjacent to the Te Apiti wind farm.

Appendix 1: Record of consultation

This information has been collated from researcher field notebooks and consultation logs. The latter contain details of time, place, method and also a log of unsuccessful efforts to contact people.

Meetings were attended by Nick Taylor with the following organisations during the initial visit of the consultants team to Otago in December 2005

Kai Tahu
Dept of Conservation
Dunedin City Council

The following organisations were consulted by James Baines during the Scoping visit, 21-23 February 2006

Tuesday, 21 February
Dept of Conservation
Strath-Taieri Community Board
Middlemarch Tourism
NZ Police, Middlemarch
Clarks Junction Hotel

Wednesday, 22 February
Dunedin City Council, Planning
Otago Tramping & Mountaineering Club
Tourism Dunedin
City Bus Newton
Taieri Aero Club

Thursday, 23 February
Clutha District Council

Thirteen residents from Mahinerangi, Lawrence and Waitahuna had discussions with James Baines during the Open Day held at Outram, 23 February 2006 and the second Open Day held in Dunedin, 28 March 2006

The Main Assessment visit, 4-7 September 2006 involved interviews with 34 farming residents of the Mahinerangi area, personnel associated with Lee Stream School, four permanent residents of the Lake Mahinerangi Fishing Village and three other crib owners, representatives of two forestry companies, seven representatives of outdoor recreation groups or major events which have passed through the Mahinerangi area, community board representatives from Mosgiel and Lawrence, and three local business operators.

Appendix 2: Major events which have occasionally been hosted in the Mahinerangi area

The Cavalcade

The annual Cavalcade event, organised by the Otago Goldfields Heritage Trust¹³¹, is described as a mixture of recreation, re-enactment and tourism. First organised in 1991, the event culminates at midday on the first Saturday of March when all the trails¹³² converge on the host town. There are now typically 500 people involved, along with 300 horses and 20 wagons. The shortest trail might take 3 days, while the longest trail could take up to 9-10 days.

During the 14 years it has been running¹³³, settlements or townships closest to the Mahinerangi area have been Gabriels' Gully (near Lawrence) in 1994, Middlemarch in 2002, and Wetherston (near Lawrence) in 2005. When the Cavalcade was hosted at Wetherston in 2005, a walking trail was organised starting from Outram. This walking trail involved ~80 people who stayed the first night in the Reid's woolshed on Mahinerangi Road, then moved on to Lake Mahinerangi and Post Office Creek, staying another night in a woolshed on one of the Landcorp properties.

Each trail is organised by a trail boss, assisted by 'wranglers' who act as guides and helpers.

Annual turnover has totalled approximately \$200,000 in recent events; money which goes to pay landowners for accommodation, as well as local community groups who provide catering services for all meals during the trail.

Cross-country multi-sport endurance events

Two cross-country, multi-sport endurance events have made use of this general area in the past. They are the Arrow 24-hour Endurance Race and the Southern Traverse.

Arrow sponsors ten 24-hour endurance events throughout the country each year. The first Otago event was held in near Dunedin 1996¹³⁴ and again in 2003 when the route was focused geographically around Warrington, Hindon, Waikouaiti and the coast north of Dunedin.

The organiser indicated that they choose a different location each year, but might return to one location every 4-5 years. Locations are chosen to provide interesting challenges for the competitors, unique terrain, not necessarily tracked, and visually attractive.

¹³¹ The stated purpose of the Otago Goldfield Heritage Trust is to create awareness and promote the gold towns and trails of Otago - <http://nzsouth.co.nz/goldfields/frames.html>

¹³² Three types of trail are involved - horse riding trails, horse-drawn wagon trails, and walking trails.

¹³³ Other host towns include: Cromwell (1991), Alexandra (1992), Arrowtown (1993), Naseby (1995), Cardrona (1996), Cromwell (1998), Ophir (1999), Roxburgh (2001), Waikaia (2003), Kurow (2004), Patearoa (2006); planned for Clyde (2007).

¹³⁴ Other Otago Arrow 24-hour races have focused on the Clyde Dam, Roxburgh Dam, Old Man Range and Alexandra (2006); the Wanaka-Queenstown area (2005).

Since 1996, the event has twice passed through the area close to the proposed wind farm site. In 2002, the event began with a mountain-bike section from Clark's Junction along the Old Dunstan Trail, across the Lammermoors and Lammerlaws to the Glendhu Forest. The second stage involved kayaking the length of Lake Mahinerangi to the power station. The third stage involved running through the Waipori Forest, while the fourth stage involved kayaking along the Waipori and Taieri Rivers to the Taieri River Mouth. The 2004 event started on the Clutha River below Roxburgh, passed through Beaumont, over the Lammerlaws, across Lake Mahinerangi and down the Waipori River.

Recently, the 2006 Manawatu event was staged, passing through the Manawatu Gorge in close proximity to established wind farms.

The Southern Traverse is a 5-6 day multi-sport endurance event, attracting competitors from as many as 10-12 countries. Organisers generally try to have the event reflect the rugged back country of New Zealand, with the publicity photographs tending to highlight the more remote parts of the back country. So far, the Southern Traverse has always been held in the South Island¹³⁵. Since the first annual event in 1991, ten out of 15 events have been linked to Queenstown. Other locations have included Nelson (1999), the Canterbury high country (2000), twice on the West Coast (Hokitika in 2004 and Westport in 2005), and Dunedin (2003). Several hundred competitors and support crews are typically involved in each event.

The Course for the 2003 event out of Dunedin¹³⁶ began with a 3 km run from the Octagon to the Otago Yacht Club followed by a 22 km kayak stage up Otago Harbour and 16 km of coasteering from Aramoana to Warrington. Stage 3 involved trekking for 27 km from Warrington to Evansdale and then to Whare Flat. Stage 4 was 50 km on mountain bikes from Whare Flat to Outram, followed by Stage 5 kayaking 35 km along the Taieri River to Lake Waipori and Berwick. Stage 6 involved 50 km of mountain biking from Berwick to Lake Mahinerangi through the Waipori forest, while Stage 7 involved most of a day (or night) trekking 70 km across the Lammerlaws and Lammermoors, accessing the area via the Lammerlaw Stream. Stage 8 returned to Lake Mahinerangi with 25 km of kayaking while Stage 9 involved 14 km of trekking through the Waipori Forest. Stage 10 involved 40 km of mountain biking from Lake Mahinerangi to Berwick followed by Stage 11, kayaking 27 km from Lake Waipori, along the Taieri River to the Taieri Mouth. The final two stages involved 20 km of mountain biking through the Otago Coast Forest and coasteering 12 km from Brighton to St Clair.

The Dunedin course in 2003 involved several stages in close proximity to urban settlement and several stages through moderately settled rural land. This course therefore contrasted with most of the other courses where the route was generally through much more remote back country.

¹³⁵ However, the organiser indicated that requests have been received from places in the North Island.

¹³⁶ <http://www.southerntraverse.com>

Appendix 3 Extract from EECA survey of public attitudes to wind farms in New Zealand

In 2004 the Energy Efficiency and Conservation Authority (EECA) commissioned a national survey which explored attitudes to various forms of electricity generation and in particular attitudes to wind farms being established locally. These responses could be said to reflect the attitudes of wider regional residents, and to encompass the circumstances that might be experienced by those living in the wider regional community. Data for All New Zealand is included for comparative purposes.

Table 1 *“Approve or disapprove of wind power for New Zealand to generate electricity”*

Responding Group	<i>“approve/strongly approve”</i>	<i>“neither approve nor disapprove”</i>	<i>“disapprove/ strongly disapprove”</i>	<i>“unsure”</i>
All NZers	82%	12%	5%	1%
Non-metropolitan NZers	83%	11%	4%	2%
South Islanders	84%	10%	6%	0%
Rural NZers	86%	9%	4%	1%

Table 2 *“Type of electricity generation you MOST prefer to meet future needs”*

Responding Group	<i>wind</i>	<i>hydro</i>	<i>geoth.</i>	<i>coal</i>	<i>gas</i>	<i>other</i>	<i>unsure</i>
All NZers	41%	41%	5%	4%	3%	3%	3%
Non-metropolitan NZers	40%	44%	3%	3%	4%	3%	3%
South Islanders	41%	41%	3%	7%	3%	1%	4%
Rural NZers	40%	41%	4%	6%	1%	4%	4%

The survey also tested levels of support and opposition to several scenarios using the following question - *“how would you feel about having a wind farm built in your local area under the following conditions?”* Responses in Table 2 could be said to reflect the circumstances likely to be experienced by residents of the wider regional community.

Table 3 ***“If you could not see or hear the windmills form your house”***

Responding Group	<i>“in favour/strongly in favour”</i>	<i>“neither in favour nor against”</i>	<i>“against/ strongly against”</i>	<i>“unsure”</i>
All NZers	76%	14%	9%	1%
Non-metropolitan NZers	81%	13%	5%	1%
South Islanders	83%	9%	7%	1%
Rural NZers	72%	13%	12%	3%

Tables 4 and 5 summarise responses to two scenarios that could be said to encompass the range of circumstances that might be experienced within the immediate host community at Mahinerangi.

Table 4 ***“If you could not hear them but see them as distant windmills on the skyline from your house”***

Responding Group	<i>“in favour/strongly in favour”</i>	<i>“neither in favour nor against”</i>	<i>“against/ strongly against”</i>	<i>“unsure”</i>
All NZers	66%	19%	14%	1%
Non-metropolitan NZers	68%	20%	11%	1%
South Islanders	71%	13%	15%	1%
Rural NZers	60%	22%	16%	2%

Table 5 ***“If you could not hear the windmills but could see them across the road from your house”***

Responding Group	<i>“in favour/strongly in favour”</i>	<i>“neither in favour nor against”</i>	<i>“against/ strongly against”</i>	<i>“unsure”</i>
All NZers	40%	25%	34%	1%
Non-metropolitan NZers	40%	28%	31%	1%
South Islanders	43%	23%	34%	0%
Rural NZers	38%	23%	38%	1%

Appendix 4 Survey results on noise effects from Taylor Baines Rapid Appraisal (April 2005) and comparison with Shepherd Survey (January 2005)

The summarised raw data from the Taylor Baines survey are shown in Tables 1 and 2. Table 1 summarises data on the number of people hearing turbine noise while Table 2 summarises data on the frequency of hearing turbine noise. The Taylor Baines Ashhurst survey contained a small sample of residents¹³⁷ living closer than the rest of the township at 2 km from the nearest turbines. When compared with the rest of Ashhurst, their responses indicate the influence of distance on the likely experience of turbine noise (see Tables 1 and 2).

Table 1: Responses to questions on noise effects

	Contiguous Ashhurst Eastern fringe	River Road/Saddle Road
Total number interviewed	49	5
Number interviewed who could hear turbines on their property	19	5
Pleasant impact	2	0
No impact	14	2
Mixed impact	1	0
Negative impact	2	3
for 'negative impact' responses:		
degree of impact - high	1	2
degree of impact - moderate	1	1
degree of impact - low	-	-

Table 2: Responses to the question on how often noise effects are experienced

	Contiguous Ashhurst Eastern fringe	River Road/Saddle Road
Total number interviewed	49	5
Number interviewed who could hear turbines on their property	19	5
Frequency of hearing - every day	1	0
Frequency of hearing - a few days each week	3	0
Frequency of hearing - once a week	2	2
Frequency of hearing - occasionally (1-2Xper month)	4	2
Frequency of hearing - less than occasionally	8	1
Frequency of hearing - not sure	1	0
Never hear the turbines at all	30	0

¹³⁷

From all five households along River Road.

Even though they are more likely to experience negative impacts, they do not necessarily hear the turbine noise more often¹³⁸. It is evident from the range of comments that the intensity of impact on people’s sense of well being is highly individualistic, reflecting different thresholds of acceptability in response to a similar noise source.

Table 3 Responses from the 17 rural residents covered by the Taylor Baines Rapid Appraisal interviews are tabulated below.

Number of responses	Typical description of impact	Frequency of occurrence
6 - never hear the turbines at all	n/a	n/a
5 - hear but no impact	n/a	occasionally (1 or 2 times/month)
4 - hear, with mixed impacts	<i>“sounds like a drone or train” “alerts me” “learn to shut off and not notice it, except when particularly loud we comment on it; really do not take much notice - no different to the sound of wind going through the trees”</i>	occasionally (1 or 2 times /month to several times/year)
2 - hear, with negative impacts	<i>“Irritating noise - carries on; a raging sea, similar to the ocean” “Peace is broken; impact on countryside quietness”</i>	few days/week in downwind conditions

¹³⁸ Of the three respondents reporting negative impacts, one had heard the turbines on two occasions in a year, one hears them once or twice a month, while the third hears them typically once a week.

Table 4 Comparative responses on noise impacts for respondents living within the contiguous, built-up area of Ashhurst (2.5 km-4.0 km from nearest turbine).

Dr Shepherd's results n=77		Taylor Baines' results n=49 ¹³⁹	
% respondents who found turbine noise intrusive at times and considered it impacted upon their quality of life	5%	% respondents who experienced moderately or highly negative impacts from turbine noise	4%
% respondents who noticed turbine noise occasionally but were not bothered by it	28.5%	% respondents who noticed turbine noise occasionally but experienced no impacts from this	28.5%
% respondents who had not noticed any turbine noise at all	66.5%	% respondents who had not noticed any turbine noise at all	61.5%
		% respondents who noticed turbine noise and experienced pleasant impacts	4%
		% respondents who noticed turbine noise and experienced mixed impacts	2%

These two surveys both indicate that 1-in-20 respondents, living between 2.5 km and 4 km of the nearest turbines, have experienced a negative impact on their well being. Just under 30% of respondents notice turbine noise occasionally but are not bothered by it, and almost two-thirds have never heard any turbine noise at all. Thus, while a significant minority in relatively close proximity do hear the turbines, very few of these have experienced a significant loss of amenity, and none of those interviewed suggested that sleep disturbance had ever been an issue for them or anyone in their household.

¹³⁹

For comparability between the two sampling areas, the Taylor Baines results for the contiguous, built-up area of Ashhurst have been used.