Your Reference:
Our Reference: MIN43683.03

Mr N Laurie
The Clerk of the Parliament
Queensland Parliamentary Service
Parliament House
tableoffice@parliament.qld.gov.au

Dear Mr Laurie

Re: Proposed Millmerran to Middle Ridge Transmission Line

I refer to your letter of 14 March 2003, addressed to the Honourable Terry Mackenroth MP, Deputy Premier, Treasurer and Minister for Sport, forwarding a copy of the petition lodged in the Queensland Legislative Assembly, objecting to Powerlink Queensland's (Powerlink) high voltage powerline proposal from Millmerran to Middle Ridge. As energy matters are now within my portfolio responsibilities, I have been forwarded a copy of the petition.

I also refer to the letter of 11 November 2002 from Deputy Premier to you in response to an e-petition tabled on 22 October 2002 regarding the same matter. I have also previously provided this information to the Power Down Under (PDU) community group and to people who have written to the Queensland Government expressing their concerns regarding the proposed Millmerran to Middle Ridge transmission line.

Further to the information previously provided to the Queensland Parliament by the Deputy Premier, the following information is provided to address the petitioners' concerns.

The Need to Augment the Transmission Network in Southern Queensland

Powerlink publishes an *Annual Planning Report* (approximately mid year) which is available on its website (www.powerlink.com.au) and outlines forecast loads and network capability on the whole Queensland electricity system.

Powerlink has also published a document *Emerging Transmission Network Limitations Darling Downs Area 2002* which is also available on its web site.

Electricity demand in southern Queensland as a whole is currently growing at approximately 3.8% per annum. However, demand in the Darling Downs area has grown at approximately 4.75% per annum for the past six years and steady growth is forecast to continue.

The load in the region served by the Middle Ridge substation on the Darling Downs over the current summer was 277 MegaWatt (MW) on 4 December 2002. By the summer of 2004-05, this load is predicted to be 292 MW. Were the existing Tarong to Middle Ridge transmission line to be out of service for any reason, then the 110 kiloVolt (kV) lines from Swanbank would not meet the Darling Downs load. To give you an idea of the impact of this situation, due to a bush fire on 25 October 2002, the Tarong to Middle Ridge transmission line was out of service for approximately five and a half hours. On that occasion (due to other works on the network) load shedding was required in the Ipswich area. I am advised that, even if the network is operating at full capacity, a similar outage (to the bush fire caused outage) in the summer of 2004-05 would result in substantial load shedding on the Darling Downs.

In accordance with the requirements of the National Electricity Code, Powerlink must meet a reliability standard which requires that the full demand must still be met with any one element of the transmission network out of service.

The request of the petitioners to abandon Powerlink's proposal has been noted. Powerlink has advised there will not be sufficient power in 2004-05 in the event of an outage of the existing Tarong to Middle Ridge line, which supplies power to the Middle Ridge substation serving the Darling Downs region. If we are to have electricity in our communities for our homes, farms and businesses then it must be transmitted from power stations to those communities. As the elected Minister with responsibility for Energy, I am not prepared to allow a situation to develop whereby communities are affected by power outages as a result of transmission issues and I will do all I can to support adequate electricity transmission into the Darling Downs in the period 2004-05 and beyond.

In addition, Powerlink has estimated that, based on medium load growth projections, the existing transmission grid would not provide a secure and reliable electricity supply to the Logan/Brisbane South/Gold Coast area by 2009.

Factors Considered in Developing Planning Options

Planning Framework

Under the integrated planning framework of the National Electricity Market, Powerlink has to consider all known needs for the development of the network in the region. Powerlink evaluates these needs over a period of 15 years. Powerlink must select the solution which delivers the lowest cost to electricity consumers and provides the most electricity market benefits.

The supply options, therefore, must meet the needs of the Darling Downs by 2004-05 and the Logan/Brisbane South/Gold Coast area by 2009.

The petitioners have also requested Powerlink investigate possible alternative routes for the proposed powerline. Powerlink has provided details of several alternative routes that have been investigated to augment the transmission network supplying southern Queensland.

Powerlink's advised solutions

In October 2002, Powerlink advised it had considered two options, both utilising high voltage alternating current (HV AC) overhead powerline. These two options were included in the Deputy Premier's letter of 11 November 2002. Since November 2002, Powerlink has considered several additional options and has also been able to provide more detailed costings of all options, including undergrounding.

Solution A – Millmerran to Middle Ridge and then Middle Ridge to Logan. This option involves a new line from Millmerran to Middle Ridge and relevant substation works at each end by 2004-05 giving a total cost for this section of $71.3 million. A new line from Middle Ridge to Logan is required by 2009. The new line and the associated substation works give a total cost of $60.4 million for this stage. Therefore, the total cost of Solution A is $131.7 million ($71.3 million plus $60.4 million).

Solution B – Tarong to Middle Ridge and then Millmerran to Logan. This option involves a new line from Tarong to Middle Ridge plus associated substation works by 2004-05 giving a total cost for this section of $46.8 million. A new line is then required from Millmerran to Logan by 2009, costing $113.2 million for the line and the associated substation works. Therefore, the total cost of Solution B is $160 million ($46.8 million plus $113.2 million). Upgrading the current transmission line between Tarong and Middle Ridge is not possible. This line needs to remain operational as it is the major line supplying electricity to the Darling Downs region. Construction of a second transmission line between Tarong and Middle Ridge will require acquisition of another easement and will further impact on communities along this easement.

Powerlink has advised that Solution A meets both of the supply augmentation needs at the lowest total cost to electricity consumers, and offers other benefits such as fewer kilometres of new lines, fewer new easements, increased diversity of supply routes into Middle Ridge and greater electricity market benefits.

Other suggested options

Powerlink has also considered alternative routes suggested by the community to augment power to southern Queensland. These include:

Solution C – upgrading the Queensland New South Wales Interconnector (QNI) between Braemar and Tarong (new line plus substation augmentation for $75 million) and a new line from Tarong to Murphy's Creek/Middle Ridge ($46.8 million, including relevant substation works).

This suggestion is only a partial solution – it addresses the supply to Middle Ridge but it does not address the Logan need by 2009. This would require a new line to Logan, either from Millmerran as per Solution B ($113.2 million) or from Tarong as per Solution D below ($180 million). Solution C (assuming a new line from Millmerran to Logan) has an estimated total capital cost of $235 million ($75 million + $46.8 million + $113.2 million), which is much higher than Solutions A or B.

Solution D – which involves using the long term future 500 kV easements from Halys (near Tarong) to Springdale (near Gatton) and to Logan ($180 million, including relevant substation works) plus a new line from Tarong to Murphy's Creek/Middle Ridge ($46.8 million, including relevant substation works).

Within the 15 year timeframe, this would also require the section of QNI between Braemar and Tarong to be upgraded ($75 million). The total estimated capital cost of this solution (which would meet both needs) is $301.8 million ($180 million + $46.8 million + $75 million), again much higher than Solution A or B.

Underground transmission lines

Powerlink has also investigated the costs of several options to underground the Millmerran to Middle Ridge transmission line. As the proposed overhead HV AC transmission line between Millmerran and Middle Ridge will have a capacity of 800 MW, any underground line would need to have the same capacity.

One option to underground involves a conventional HV AC underground line of 800 MW capacity.

Another option considers the newer technology high voltage direct current (HV DC) Light system manufactured by ABB. The HV DC Light systems installed so far by ABB have a capacity of about 200 MW, and consequently four such systems are needed to deliver a total transfer capability of 800 MW. Each HV DC system requires a large AC/DC converter station at each end because the rest of the grid is an AC system. The costs for these DC systems include the costs of the converter stations. The costs for the HV DC Light systems were provided by ABB.

The comparison excludes substation works which are common to all options.

- overhead HV AC line $ 43 million
- underground HV AC line $ 486 million
- four HV DC Light underground systems $ 500 million

Thus, the cost of undergrounding the same route compared to the overground option is an additional $443 million. In terms of the Smart State agenda, this is 74 times the State's contribution to the annual operating budget of the Queensland Institute of Medical Research, or roughly twice the State's contribution to the annual capital works budget of Education Queensland. To divert monies from purposes such as these, when there is no medical evidence to justify such an action, would be an inefficient use of public funds.

The options suggested by the community and the underground option do not satisfy the Australian Competition and Consumer Commission (ACCC) Regulatory Test which requires Powerlink to select the least cost option.

The petition also states factors such as social, environmental, land usage, aesthetic and health impacts should be given proper consideration. The impact of the proposed Millmerran to Middle Ridge transmission line on environmental, community, cultural and socioeconomic factors will be formally considered in an Environmental Impact Assessment (EIA). Powerlink has engaged Environmental Consultants to conduct a comprehensive EIA. The consultants selected by Powerlink for the preparation of the EIA for this project are competent professionals with experience in assessing the impacts of overhead transmission lines. The consultants selected are C&B Consultants, one of Queensland's leading land management and development consultancies specialising in project management, planning, environmental services, surveying, mapping and GIS services. They have more than 40 years experience and their expertise extends into a full range of industries and sectors including industrial and commercial development, infrastructure and construction and residential development. For more information about the C&B group, please refer to their website at www.cbgroup.com.au. They were selected from a recently constituted pre-qualified panel of environmental consultants.

At this stage, Powerlink has proposed the draft EIA be prepared and issued for public comment in May 2003 and be available on Powerlink's website. Any comments on the draft document received from government agencies, non-government bodies and community members will be considered and included in the final EIA. The final EIA report provides detailed information and recommendations on a preferred transmission line route. The EIA process also investigates how any potential negative impact can be avoided or minimised.

The final EIA report will also contain an Environmental Management Plan (EMP) which outlines ways to minimise any potential environmental impacts. The EMP will document detailed work plans to be implemented during construction of the transmission line.

The petition also alphabetically lists several concerns held by residents regarding the proposed transmission line. Each of these concerns has been addressed by the Deputy Premier in response to the e-petition and also by myself on numerous occasions to individuals and community representatives of PDU.

Powerlink has previously advised that compensation will be paid to directly affected property owners at the time of easement acquisition. Appeal mechanisms exist for property owners if they are dissatisfied with Powerlink's valuation and compensation offer.

If a property owner is unhappy with the valuation, Powerlink will meet the reasonable costs for their own valuation and legal advice, provided that agreement on valuation can be subsequently reached with Powerlink. Reimbursement of these professional fees paid by the property owner will be made when the compensation claim is settled.

If agreement on compensation cannot be reached, either party can refer the matter to an independent arbitrator, the Land Court, for a decision. That decision is binding on the parties and the Court will also determine who pays the associated professional costs.

To offset social and visual impacts of a new transmission line on the wider community, Powerlink proposes to set up a Community Offsets Program to fund initiatives identified by the relevant local communities. Details of the proposed Community Offsets Program will be made available to the local councils and communities in due course.

The Queensland Government is aware of concerns within the community regarding the possibility of adverse health effects from exposure to electric and magnetic fields (EMFs). I reiterate the advice provided in the Deputy Premier's letter of 11 November 2002 stating that the Government relies on the opinion of expert medical review panels, rather than individual researchers, for its advice on health matters, such as the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

ARPANSA is a Federal Government agency (within the portfolio of the Commonwealth Minister for Health and Ageing) charged with responsibility for protecting the health and safety of people and the environment from the harmful effects of radiation. In its April 2002 information sheet, *The Controversy over Electromagnetic Fields and Possible Adverse Health Effects*, ARPANSA concludes:

"On balance, the scientific evidence does not indicate that exposure to 50 Hertz (Hz) EMFs found around the home, the office or near power lines is a hazard to human health."

The full text of this document can be obtained on the ARPANSA website at www.arpansa.gov.au.

The National Health and Medical Research Council (NHMRC) of Australia published *Interim guidelines on the limits of exposure to 50/60 Hz EMFs*. These guidelines are based on recommendations of the International Commission on Non-Ionising Radiation Protection. The exposure limit to 50 Hz magnetic fields for 24 hours per day, set out in the NHMRC interim guidelines is 1,000 milliGauss (mG).

All transmission and distribution lines in Australia are designed to produce ground level EMFs much lower than the levels recommended in the interim guidelines.

Powerlink's policy of "prudent avoidance" (i.e. doing whatever is reasonable to minimise exposure to EMFs) when designing new electricity infrastructure involves locating the towers within the powerline easement to maximise the distance between the powerline and the nearest habitation, configuring the powerline conductors to reduce EMFs and increasing the height of the conductors above the ground.

The strengths of EMFs rapidly decrease with increasing distance from a transmission line. In mathematical terms, if the distance doubles, the field strength reduces by a factor of four. This relationship is illustrated in the following example.

For the type of high voltage transmission line proposed for Millmerran to Middle Ridge, the strength of the magnetic field, under full load conditions, would typically be:

At ground level at a point X directly under the powerline and where the powerline comes closest to the ground (usually midway between adjacent towers)	100 mG
At ground level 20 m from X and at right angles to the direction of the travel of the powerline	24 mG
At ground level a total of 30 m from X	10 mG
At ground level a total of 40 m from X	5 mG
At ground level a total of 100 m from X	<0.5 mG

The required easement width for the proposed 330 kV transmission line from Millmerran to Middle Ridge is 60 metres. The magnetic field strengths at the edge of the easement under full load conditions will typically be 10 mG.

Further, for your assistance, I detail below for comparison purposes the EMFs which are associated with household appliances.

The average magnetic fields in Australian homes range from 0.5 mG to 5 mG. These magnetic fields are produced by domestic appliances, fixed wiring in the home and extension leads. The table below shows some typical values of magnetic fields from domestic appliances measured at normal operating distances from the appliances.

Magnetic Field Source	**Typical Measurement (in mG)**	**Range of Measurements (in mG)**
Hairdryer	25	10 – 70
Electric Blanket	20	5 – 30
Electric Stove	6	2 – 30
Computer Screen	5	2 – 20
Electric Kettle	3	2 – 10
Refrigerator	2	2 – 5
Television Screen	1	0.2 – 2

A comparison of the above values shows, for instance, that a person operating a computer would be exposed to magnetic fields comparable to those experienced by a person standing 40 m away from the powerline.

Powerlink is a member of the Electric and Magnetic Fields Advisory Committee (EMFAC) of the Electricity Supply Association of Australia (ESAA). As a member of EMFAC, Powerlink has access to the latest information published by scientific review panels.

In order to allay public concerns and raise general awareness about EMFs, Powerlink has provided information on the news and information page of its website at www.powerlink.com.au. Additional government and industry websites also provide information about EMFs, including the ARPANSA website at www.arpansa.gov.au and the ESAA website at www.esaa.com.au.

I note you are required to publish my response on the Parliamentary website. Accordingly, my office will email an electronic version of my response to you.

Yours sincerely

PAUL LUCAS MP
Minister for Innovation
and Information Economy
Minister with responsibility for Energy