MDL welcomes the opportunity to submit on the report produced by the Panel of Expert Advisers (PEA) in relation to its review of Transmission Access and Capacity Pricing (PEA Report).

1. **The PEA Principles**

1.1 When considering options, the PEA will select options that:

(a) promote static and dynamic efficiency in innovation and investment in and use of transmission capacity and alternatives to transmission;

(b) enhance competition in the retail and wholesale gas markets;

(c) improve transparency of market information; and

(d) promote certainty in market and regulatory arrangements, to the extent it is efficient,

(together the PEA Principles).

1.2 MDL supports, and has referred to, the PEA Principles in preparing this submission.

2. **Transmission arrangements in New Zealand - issues**

2.1 MDL has considered the issues raised by the GIC and the PEA with respect to transmission arrangements in New Zealand:

(a) the capacity product definition allows grandfathering, which inhibits the efficient primary allocation of transmission capacity;

(b) there is no price signal for scarce capacity, either in the short or long run;

(c) interruptible capacity rights are not formalised or transparent;

(d) the effectiveness of the secondary market is still unclear but it is thinly traded and non-transparent;

(e) there is a lack of transparency regarding the determination of the amount of commercially available capacity; and

(f) the regulatory regime applying to investment in additional capacity is uncertain.

2.2 MDL believes that there are some additional issues with the current arrangements on the Vector Transmission System (VTS):

---

1 MDL notes a number of these issues only manifest on the Vector Transmission System. For example in relation to 2.1(c) the Maui Transmission System does have a formalised interruptible capacity mechanism. In relation to 2.1(e), the Maui Transmission System capacity limit is notified on a daily basis on the MDL IX.
(a) the allocation of contractual capacity rights to shippers creates “contractual” pipeline congestion when there is no physical constraint on pipeline capacity;

(b) the high price of capacity used by shippers in excess of their booked capacity reservation creates incentives to over-book capacity;\(^2\)

(c) the lack of a binding nominations regime on the VTS; and

(d) the emphasis on point-to-point capacity blocks tends to hinder the tradability of excess capacity.

2.3 MDL acknowledges that there are also some issues with the current arrangements on the Maui Transmission System (MTS). These issues are identified in Section 6 of this submission and MDL looks forward to working through these issues with the GIC and members of the industry in due course.

3. The effect of applying the VTC model, modified by the PEA Straw Man recommendations, on MTS (PEA Straw Man VTC Modification)

3.1 MDL has analysed the effect of applying the PEA Straw Man VTC Modification (PSMVM) on MTS. The findings of this analysis are set out in Appendix A. The analysis shows that adopting the PSMVM on MTS would be likely to generate an artificial capacity constraint (i.e. the pipeline’s contractual capacity would be reached before its physical capacity is), much like that currently being experienced on VTS.

3.2 MTS does not experience these problems now. It would therefore be a retrograde step to apply a model of this kind on MTS. MDL, in consultation with all industry participants, designed the Maui Pipeline Operating Code (MPOC) to optimise the utilisation of the physical capacity of the MTS to the extent possible.

4. Vector’s Northern Pipeline is experiencing contractual congestion

4.1 MDL has compared the capacity utilisation of the Northern Pipeline and the Maui Pipeline between Mokau compressor station and Rotowaro (North MTS). The analysis, set out in Appendix B, reveals that:

(a) there is a correspondence (or comparability) between the capacity utilisation of the Northern Pipeline and the North MTS; and

(b) the North MTS has at least the same level of “physical congestion” as the Northern Pipeline and a higher overall utilisation.

4.2 MDL concludes that the Northern Pipeline is experiencing contractual congestion.

5. The PEA Straw Man

5.1 A goal for the PEA should be to recommend a solution that makes all of the physical capacity of the pipeline available to shippers each day.

---

\(^2\) Gas take in excess of reservation is known as ‘overrun’ in the Vector Transmission Code.
5.2 Even in an efficient system, the frequency of physical congestion (where demand for transmission services exceeds available supply) would need to be high enough to justify the additional investment in capacity. If peak loads that exceed physical capacity are infrequent, there may be insufficient economic justification for building new capacity.

5.3 Given that shippers’ access to capacity may be curtailed even when investment is not yet economically justifiable, a measure of efficiency will be the extent to which the industry can cope with physical congestion that is the inevitable result of efficient investment.

5.4 MDL agrees with the PEA that the design of capacity or transportation rights must be efficient. An efficient design will:

(a) reduce or eliminate the risk that shippers’ contractual rights prevent the full physical utilisation of the daily capacity of the pipeline;

(b) enable the full utilisation of all available physical capacity by all potential shippers (i.e., including new entrants) irrespective of their commitment to long term capacity contracts;

(c) incentivise the industry to arrange itself to minimise congestion costs (i.e. reduce the value of lost load); and

(d) incentivise further investment, but only when the industry’s congestion costs exceed the marginal costs of expansion (i.e., the efficient investment point).

5.5 MDL’s analysis of the available data suggests the efficient investment point has not been reached on New Zealand’s gas transmission systems (see Appendix B). The design of the capacity contract (on whatever system) is crucial in signalling the need for investment. MDL does not consider the PEA Straw Man design has achieved this.

How do you create the incentives for the industry to effectively and efficiently utilise existing physical capacity?

5.6 The design of the capacity allocation mechanism should encourage efficient capacity utilisation so that:

(a) any shipper is able to make nominations in excess of its reserved capacity if physical capacity is available; and

(b) any reserved or priority capacity rights should only apply in respect of a day if nominations are made before a certain deadline. After that deadline all unused capacity should be available to other users (i.e. use it on a day or lose it for the day).

---

3 On the MTS this is the “Changed Provisional” nominations cycle on the day before flow.
Priority rights or capacity reservation

5.7 The current VTS contracts and proposed PEA Straw Man both use a capacity reservation model. This model allocates pipeline capacity to shippers who must pay for that capacity, but do not have to use it. Shippers consider this capacity to be a property right. Associated with this is an ability to prevent any other incumbent or new entrant from using the shipper’s reserved but unutilised capacity. This can lead to contractual congestion if demand (comprising the sum of all reserved capacity plus all interruptible services) begins to exceed the available physical capacity of the pipeline. All of the capacity is paid for, but some of that capacity is not being used efficiently and can only be used if released into the secondary market by the shipper (who may have an economic and competitive incentive not to do so).

5.8 An alternative model to incentivise efficient use of pipeline capacity is a priority right. The MTS’ Authorised Quantity (AQ) creates such a priority right. A priority right is the right for the holder to obtain guaranteed transport of gas up to the level contracted for. If the holder uses less than the priority quantity on a day, the unused quantity is automatically available for use by other shippers on that day.

5.9 MDL believes that a priority right gives shippers any ‘firmness’ required, while still making all of the physical capacity of the pipeline available to shippers each day. AQ is a premium product: a fundamental feature is that it should not cheaper for a shipper to transport their gas with AQ (premium service) than by common carriage or interruptible services (standard service). 4

The need for a nominations regime

5.10 The PEA Report identified that a nominations scheme is required to achieve the required changes on the Northern Pipeline.

5.11 MDL agrees that a nominations scheme is an essential first step in achieving transparency on the Northern Pipeline. Nominations must be binding. MDL agrees with the PEA’s comment that because shippers already provide nominations for the MTS, the incremental cost for shippers of nominating on the VTS should not be high.

5.12 MDL acknowledges the trial of nominations currently being undertaken on portions of the VTS. However, the design falls short in a number of ways, including but not limited to the fact that:

(a) nomination timing is ex-post;
(b) some parties are exempted from providing nominations;
(c) there is no sanction for shippers not matching their physical gas flows to their scheduled nominations; and

---

4 As discussed in 6.4 (a) of this submission, MDL acknowledges this needs to be addressed by MPOC AQ.
5.13 MDL does not consider there are any impediments to implementing a nominations system on the VTS (as further explained in Appendix C which analyses the metering requirements).

Release of unutilised reserved capacity

5.14 On the VTS, a substantial portion of pipeline capacity is allocated to shippers with contractual grandfathered capacity rights. These contracts allow shippers to roll over historical capacity rights indefinitely to ensure firmness of capacity at peak times by paying an agreed price for the capacity reservation.

5.15 MDL has considered the PEA’s suggestion to reduce the impact of contractual congestion by watering down grandfathered capacity rights through a proposed 80% cap on capacity retention. However MDL does not believe that the watering down concept will achieve the desired result unless the issue of overrun fees is also addressed. Overrun fees create an incentive for shippers to reserve a higher level of capacity than is necessary or efficient. Even if 20% of capacity was released to the market each year MDL expects contractual congestion will remain because shippers will still be incentivised to purchase a higher level of reserved capacity than is optimal.

5.16 MDL recognises that some shippers require access to long term capacity for firmness. Rather than having a grandfathering regime based on the previous year’s capacity reservation quantities, MDL believes that shippers should be able to:

(a) bid for long term capacity (or, preferably, priority rights) at the time that such capacity or priority is auctioned. This would also provide a clear signal to the market about levels of investment in the pipeline (and whether further investment in capacity is justifiable); and

(b) choose the proportion of firm and overrun capacity they need driven by real individual interruption risk rather than by excessive overrun penalties.

Avoid the use of overrun fees

5.17 Currently on the VTS there are large overrun charges for shippers who exceed their reserved capacity.

5.18 High overrun fees encourage shippers to hold a much higher level of capacity than is efficient in order to avoid charges on peak days. The table below shows that if a shipper is likely to flow higher than its reserved level more than 1/8th of the time period that it has reserved capacity for, it is more economical for it to reserve capacity at its peak level rather than the lower level that reflects its “normal” demand. MDL’s view is that overrun charges are exacerbating the contractual capacity constraints on the Northern Pipeline. On 7 out of 8 days the extra capacity reserved by shippers may go unused.

---

5 OBA stands for operational balancing agreement – which allocates responsibility for imbalances to interconnected parties.
5.19 This has the consequence of:

(a) increasing the importance and value, and therefore discouraging the release, of grandfathered contracts; and

(b) artificially inflating the demand and price for firm capacity reservation and by so doing:

(i) allocating the cost of congestion onto new entrants which discourages entry into the market; and

(ii) providing all shippers with the same marginal cost of capacity (whereas what is needed for pricing efficiency is that each shipper should be able to bid a price for firm capacity based on its individual assessment of the risk of interruption and the value of any lost load).

**Point-to-point product definition and secondary trading**

5.20 MDL concurs with the view expressed in the Brattle Report that the flexibility offered to shippers in terms of location of injections and withdrawals is important for the development of competition.\(^6\) The PEA Straw Man proposes to retain the point-to-point VTS product. A point-to-point product limits flexibility and inhibits secondary trading because:

(a) a shipper may try to sell capacity that is no longer needed but may find it difficult to find a buyer – the transportation capacity will only have value to another shipper who is interested in precisely the same combination of points; and

(b) it delinks real time gas markets from the sale of transportation capacity because TSO approval is required for any change of point, which means capacity trades are merely provisional and subject to TSO approval criteria and timeframes.

---

5.21 In MDL’s view, route flexibility (using a zonal product) encourages secondary trading and promotes competition because:

(a) new entrants can start out small, establish a market position and grow through innovation and competitive prices;

(b) a liquid secondary market can send valuable market signals. For example if long-term transportation capacity sells for a significant premium in a secondary market it indicates potential congestion and the need for investment in extra capacity (see Diagram 1, Appendix D); and

(c) information transparency is improved, which makes participating in the market more attractive and provides vital information for sound commercial decision-making.

5.22 MDL acknowledges that a point-to-point product does enable the TSO to offer more firm capacity for sale, and therefore there is a trade-off between capacity allocation and secondary market liquidity. However, MDL notes that maximising allocated capacity does not necessarily result in full utilisation of physical capacity. It may have the opposite effect. Allocative efficiency arises from the full utilisation of pipeline capacity, not necessarily from pre-selling the maximum amount of pipeline capacity.

5.23 MDL employs a different model to address the issue. MDL’s runs its curtailment allocation model on the day before gas flows (the “Changed Provisional Cycle”) at an injection point, with capacity assessed on the real pattern of demand (determined by nominations for transport on the day). This enables MDL to be less conservative in allocating capacity and utilise capacity more efficiently.

**Transparency**

5.24 The MPOC requires MDL to provide a great deal of transparency in all of its operations by making the following information publicly available:

(a) indicative available pipeline capacity for each day;

(b) rolling capacity forecast, updated monthly;

(c) line pack, updated hourly;

(d) hourly metering data from each large station welded point;

(e) scheduled quantities at each welded point;

(f) special terms and conditions for any particular shipper or welded party;

(g) standard operating procedures for, and written material instructions to, the commercial operator, technical operator or system operator of the MTS; and

(h) long term records of schedule quantities and metered quantities at each welded point.
5.25 In MDL’s view, this level of transparency should be adopted by all TSOs.

5.26 MDL believes that full discussion and analysis of the current issues on the Northern Pipeline has been impeded by a lack of information.

6. The MTS capacity allocation model

6.1 The AQ product used on the MTS has the following features, as outlined in the MPOC:

(a) a product definition that consists of priority to physical capacity, but not exclusive reservation of that capacity;

(b) a zonal, rather than point-to-point, service;

(c) a binding daily nominations regime;

(d) allocation by auction;

(e) a secondary market for holders of AQ to trading unwanted AQ, in whole or part, and in daily or multi-day increments; and

(f) no overrun charges. The curtailment processes and financial incentives set out in the MPOC encourage full use of authorised capacity and remove any incentives for shippers to bid for more capacity than they need.

6.2 Features and benefits of AQ are set out in Appendix D. The inclusion of this information is intended to enable the PEA and the industry to consider how the capacity allocation issues identified by the PEA Report are dealt with by the MTS.

Proposed improvements to the MPOC

6.3 MDL acknowledges the AQ model set out in the MPOC has not yet been tested as there have been no requests for it. In MDL’s view this is likely to be because MTS shippers have assessed that the cost of curtailment is acceptable.

6.4 However, MDL believes that to be consistent with the submissions set out in this document and the PEA Principles the following improvements to the MPOC AQ model may be needed:

(a) removing the reference to a discount for buyers of long term AQ;

(b) increasing transparency by disclosing the terms of all AQs; and

(c) finalising the auctioning/queuing rules for allocating AQ in consultation with GIC and the industry.

6.5 MDL looks forward to working through these issues with the GIC and members of the industry in due course.
APPENDIX A
OVERLAYING THE PEA STRAW MAN VTC MODIFICATION ON THE NORTH MTS

1. MDL has assessed the implications of overlaying the PSMVM onto the North MTS.

2. The peak flows of each welded point on the North MTS were identified for each year and compared to two alternative levels of physical pipeline capacity (320 TJ and 330 TJ – discussed below). The following table shows capacity requirements if shippers reserve 100% of their peak capacity.

<table>
<thead>
<tr>
<th>Year</th>
<th>Sum of Peak flow</th>
<th>% capacity required to meet peak flows (330TJ)</th>
<th>% capacity required to meet peak flows (320TJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>353464</td>
<td>107.1%</td>
<td>110.5%</td>
</tr>
<tr>
<td>2008</td>
<td>373356</td>
<td>113.1%</td>
<td>116.7%</td>
</tr>
<tr>
<td>2009</td>
<td>328225</td>
<td>99.5%</td>
<td>102.6%</td>
</tr>
<tr>
<td>2010</td>
<td>357367</td>
<td>108.3%</td>
<td>111.7%</td>
</tr>
<tr>
<td>2011</td>
<td>324553</td>
<td>98.3%</td>
<td>101.4%</td>
</tr>
</tbody>
</table>

3. The analysis assumed each shipper would reserve capacity for any volume of gas that it plans to flow over 12.5% of the time (due to the capacity definition and overrun fees). MDL assumed commercially oriented companies would seek to minimise their transmission charges in the context of the 8 times multiplier on overrun charges. Under these broad assumptions the optimum capacity for shippers to book is approximately 90% of their peak capacity for a year.

4. The available physical capacity was calculated using the flow data published on OATIS for the past 5 years. The results are shown on the table below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Sum of Peak Flow</th>
<th>90% Capacity Reservation</th>
<th>Level of 330TJ Capacity Utilised</th>
<th>Capacity Available (330TJ)</th>
<th>Capacity Available (320TJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>353464</td>
<td>318118</td>
<td>96.4%</td>
<td>3.6%</td>
<td>0.6%</td>
</tr>
<tr>
<td>2008</td>
<td>373356</td>
<td>336020</td>
<td>101.8%</td>
<td>-1.8%</td>
<td>-5.0%</td>
</tr>
<tr>
<td>2009</td>
<td>328225</td>
<td>290540</td>
<td>88%</td>
<td>12%</td>
<td>9.2%</td>
</tr>
<tr>
<td>2010</td>
<td>357367</td>
<td>321630</td>
<td>97.5%</td>
<td>2.5%</td>
<td>-0.5%</td>
</tr>
<tr>
<td>2011</td>
<td>324553</td>
<td>292098</td>
<td>88.5%</td>
<td>11.5%</td>
<td>8.7%</td>
</tr>
</tbody>
</table>

5. If the PSMVM capacity reservation rules had been applying on the North MTS during the data period there would have been insufficient capacity in 2008, and the pipeline would have been operating at or very near full reserved capacity in 2007, and 2010.7

---

7 Assuming a pipeline capacity of 330TJ
6. If MDL had been operating under the PSMVM, as an RPO, it would offer capacity at the most reliable level due to the high penalties it would incur should it fail to deliver the capacity promised to capacity holders. For this reason a lower 320TJ capacity allocation limit would be more realistic and possibly still too high.

7. Assuming a capacity allocating limit of 320TJ, there would have been insufficient capacity on the North MTS in 2008 and 2010 and fully allocated capacity in 2007.

8. In summary, if the PSMVM was adopted on the North MTS, MDL would expect the same contractual capacity constraints as are currently being witnessed on the Northern Pipeline.
APPENDIX B
COMPARISON BETWEEN THE NORTHERN PIPELINE AND THE NORTH MTS

1. MDL has analysed the Northern Pipeline and the North MTS in order to understand whether the physical differences between the two pipelines justify a different capacity allocation model on each pipeline.

2. The key findings of this analysis are:
   
   (a) there is a correspondence between the capacity utilisation of the Northern Pipeline and North MTS; and
   
   (b) the North MTS has at least the same level of “physical congestion” and a higher overall utilisation.

3. Background

   Northern Pipeline

3.1 Physical description

   The Northern Pipeline is made up of the segments set out in the table below. Note there is one reducing station (Papakura East) and one compression station (Henderson Road).

<table>
<thead>
<tr>
<th>Pipeline Segment</th>
<th>Nominal Bore (mm)</th>
<th>Length (km)</th>
<th>MAOP (bar g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotowaro - Papakura East Pressure Reducing Station</td>
<td>350</td>
<td>60.8</td>
<td>86</td>
</tr>
<tr>
<td>Papakura East Pressure Reducing Station - Southdown</td>
<td>350</td>
<td>28.4</td>
<td>66</td>
</tr>
<tr>
<td>Rotowaro - Papakura West</td>
<td>200</td>
<td>60.8</td>
<td>86</td>
</tr>
<tr>
<td>Ingram Rd - Glenbrook</td>
<td>150</td>
<td>23.0</td>
<td>86</td>
</tr>
<tr>
<td>Westfield - Henderson</td>
<td>200</td>
<td>35.5</td>
<td>66</td>
</tr>
<tr>
<td>Henderson - Whangarei Oftake</td>
<td>150</td>
<td>145.4</td>
<td>86</td>
</tr>
<tr>
<td>Whangarei - Kauri</td>
<td>100</td>
<td>21.5</td>
<td>86</td>
</tr>
</tbody>
</table>

   The Northern Pipeline has a single intake point at Rotowaro Compressor Station. Along the length of the Northern Pipeline there are 17 offtakes with peak weeks greater than 2000GJ, and 8 small off-takes with peak weeks less than 2000GJ.

3.2 End user demand share

   During the peak week in 2011 the end user demand share for the pipeline was:
   - 55.4% Generation
   - 8.4% Major Industrial Users
   - 18.9% Other Time of Use Metering
   - 16.7% Non-Time of Use Metering

3.3 Interruptible contracts

   The Northern Pipeline also has one interruptible contract from an end user which equates to approximately 3% of demand.
3.4 Operating Capacity

The Northern Pipeline is assumed to have a “Calculates Maximum Operating Capacity” of 217TJ, as derived from Vector’s presentation ‘Northern Pipeline Winter 2010 and Beyond’.

That presentation showed 59% of capacity was held by power stations, 5% by supplementary agreements and 36% was held as reserved capacity by other users. This was stated to equate to approximately 217TJ of reserved capacity. Further capacity release was unavailable. Of the 217TJ of Calculated Maximum Operating Capacity, 100% was assigned to end users through some form of contract.

The presentation’s definition of Northern Pipeline included the Central North section of the pipeline. Hence this is the capacity supplied by the MTS Rotowaro welded point. Flows are taken from the publicly available SQMQ reports for this welded point.

North MTS

3.5 Physical description

The MTS is made up of the segments set out in the table below. There is a single compressor on the MTS at Mokau.

The capacity of the MTS south of Mokau is well within the operating range and capacity issues are therefore unlikely on this section of the MTS. However due to the size and efficiency of the compressors at Mokau, the maximum capacity of the North MTS has been determined to be 330TJ/day (being the point at which MPOC’s curtailment mechanism would be applied). There are standard operating procedures in place as to what actions to take when capacity is nearing full utilisation. Should conditions allow, the model will allow flows slightly above 330TJ.

Along the length there are 6 Receipt point (or intakes), 1 bi-directional and 17 delivery points (offtakes). Of the delivery points, 8 had peak week flows of greater than 2000GJ, and 9 of lower than 2000GJ.

<table>
<thead>
<tr>
<th>Pipeline Segment</th>
<th>Nominal Bore (mm)</th>
<th>Length (km)</th>
<th>Design MAOP (barg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oaouui- Frankley Rd</td>
<td>850</td>
<td>43.9</td>
<td>72.4</td>
</tr>
<tr>
<td>Frankley Rd - Huntly Oftake</td>
<td>750</td>
<td>246.7</td>
<td>72.4</td>
</tr>
<tr>
<td>NP Power Station lateral</td>
<td>500</td>
<td>9.1</td>
<td>49.6</td>
</tr>
<tr>
<td>Huntly Power Station lateral</td>
<td>400</td>
<td>8.7</td>
<td>49.6</td>
</tr>
</tbody>
</table>

3.6 End user demand share

Due to the lack of end users on the MTS (most gas flows into other transmission pipelines from the Maui Pipeline) it is difficult to determine the exact composition of end users. However it is clear the Northern Pipeline has a higher level of commercial and residential end users than the rest of the New Zealand transmission network (including the MTS).
3.7 AQ

AQ has never been sought or purchased on the MTS. Of the 330TJ calculated maximum capacity north of Mokau, 0% is assigned to end users through some form of contract.

**Other Vector Pipelines**

The Frankley Road to Kapuni Section of the VTS is physically very similar to the MTS. Therefore any proposed suggestion for the Northern Pipeline should be compatible with the Frankley Road to Kapuni pipeline.

4. **Analysis - Physical Flow Comparison**

4.1 *There is correspondence between the capacity utilisation of the Northern Pipeline and North MTS.*

(a) In a physical sense the Northern Pipeline and the North MTS are similar pipelines. Whilst the MTS has a number of intakes, the North MTS has a “single intake” at Mokau. The south section of the MTS is different due to its large capacity and multiple intakes and resulting ability to operate like a storage tank. All comparisons here are therefore made between the Northern Pipeline and the North MTS.

(b) The maximum capacities of the pipelines are 330TJ for North MTS, and 217TJ for the Northern Pipeline. Using these values, the graph below shows the capacity utilisation for each pipeline for all years from 2006-2012.
4.2 North MTS has at least the same level of “physical congestion” and a higher overall utilisation.

(a) The graph below shows the highest annual capacity utilisation of the Northern Pipeline against the highest annual capacity utilisation on the North MTS. The physical capacity limits of both the Northern Pipeline and North MTS are reached less than 1% of the days during each year. The comparison shows that the MTS has a higher capacity utilisation factor than the VTS (and this is true across all years from 2006-2012). The VTS does have 2 peak days that are higher than the peak days on the MTS, and above the assumed maximum capacity of 217TJ, but this is 2/365 days per annum (or 0.55% of the year).
APPENDIX C
TIME OF USE METERING ON THE NORTHERN PIPELINE

1. As shown in Appendix B, the Northern Pipeline has significant levels (approximately 83%) of time of use (TOU) metering installed already. It is estimated that with 5 metering upgrades and SCADA installations the Northern Pipeline could achieve over 97% TOU flow information. At a very conservative pre-feasibility costing level (using recent MTS metering upgrades as a base) it is estimated that this level of TOU metering can be achieved for $1 million +/- 50%.

2. Any remaining non-TOU metering could be handled in a similar way to the current small stations on the MTS, as it will be of a similar nature (residential, commercial and small industrial).

3. In MDL’s view the physical characteristics of the Northern Pipeline with some metering upgrades could support a nominations scheme.

---

8 This estimation was based on available information, assuming that direct users have TOU metering and then creating a cumulative total from the smallest users up until the ~17% Non TOU figure. (Gas supply and demand study, a presentation by Concept Consulting, obtained on 17.08.12 at http://gasindustry.co.nz/sites/default/files/u254/18_may_12_stakeholder_workshop_v05.pdf, p 54). From here new metering and SCADA was included for the largest unmetered sites until 97% TOU was achieved. It has been assumed that metering will have to be replaced as well as SCADA installed, due to lack of knowledge with regards to the current arrangements.
APPENDIX D
AUTHORISED QUANTITIES

1. Key Commercial Characteristics of AQ

1.1 The key commercial characteristics of AQ are:

(a) If a shipper’s nominated quantity is within its AQ then that shipper’s nominations will have priority over any shipper’s non-AQ nominations. This provides shippers with AQ firm transport rights when the available capacity is exceeded by demand.

(b) Each AQ applies to one AQ zone (for the MTS, the two zones are north and south of the Mokau compressor station).

(c) Each AQ has a term which is a minimum of one year. The length of the term is agreed between the TSO and the shipper.

(d) Every shipper must agree a gas quantity for its AQ with the TSO but the quantity may be zero.

(e) The TSO warrants to maintain sufficient pipeline capacity to transport all AQ (except when the pipeline is affected by force majeure, contingency events and maintenance).

(f) In the event there is a need for capacity curtailment (as a result of force majeure for instance, or an excess of provisional nominations to capacity) then nominations falling within a shipper’s AQ will have priority over non-AQ nominations.

(g) A minimum of 30% of the capacity of each zone is always available to non-AQ shippers so as not to place excessive congestion risk on interruptible shipper nominations⁹.

(h) AQ is allocated at the primary level by auction.¹⁰ This will allow the demand for priority to capacity to set the price.

(i) AQ can be traded on a secondary market (for any period of one day or more) without the consent of the TSO.

(j) A shipper pays a fee for AQ regardless of whether it is used.

(k) The AQ product achieves high capacity utilisation because to the extent that a shipper’s nominations are less than its AQ at the Changed Provisional Cycle (i.e. the nomination cycle on the day before gas flow) that unused capacity is always available to be used by other shippers in the common carriage regime.

---

⁹ Example using MTS: if aggregate provisional nominations are for 350 TJ/day and capacity reservation is at Vector levels (assume about 90%) of 297 TJ/day out of 330 TJ/day of capacity, then interruptible shippers will need to be curtailed from 53 TJ to 33 TJ, a 38% reduction. On the other hand, if capacity reservation is limited to 230 TJ (70% of capacity), then interruptible shippers will be curtailed from 120 to 100, a reduction of only 16%.

¹⁰ The method of allocating AQ is still to be established on MTS. GIC approval is required for any allocation method proposed by MDL. The solution above has been proposed to align with the PEA’s views as expressed in the Report.
(l) Shippers can modify their nominations on the day of gas flow in one of four intraday cycles and AQ intraday nominations have priority over non-AQ intraday nominations.

2. **The MTS with congestion**

2.1 Should the MTS become more congested then MDL expects that demand for AQ may increase. In that case MDL believes the AQ system has several important benefits:

(a) The ability to bid for long-term priority to transport capacity can provide confidence to shippers or their customers to facilitate long-term investment. This provides dynamic efficiency for pipeline users.

(b) By the same token, if TSOs can sell AQ for long-term periods they will have the confidence to make long term investments in new pipeline capacity and routes. This provides dynamic efficiency for TSOs.

(c) The allocation rules for AQ are still to be determined by MDL. They must also be approved by the GIC. The allocative efficiency for AQ could be maximised through an auctioning mechanism. MDL looks forward to working with the industry to study the best allocation options prior to MDL seeking GIC approval.

(d) Because AQ can be sold in a secondary market, allocative efficiency can be maintained after the primary allocation. Priority to capacity can still go to the shipper valuing it most at any particular point in time, even for a term of only one day.

(e) This ability also removes the need for interruptible capacity contracts. A shipper with AQ can subject itself to the risk of interruption if it is willing to sell, and another shipper is willing to buy, the AQ on the secondary market. This creates portfolio flexibility and provides an essential price indicator to the cost of interruption (which is crucial for assessing the justification for new investment).

(f) Secondary sales of AQ are not limited in duration. A shipper could sell its AQ for the remainder of its term until its AQ Expiry Date. This allows for continuing dynamic efficiency as well.

(g) An important feature of AQ is that it applies to zones, instead of being point-to-point. This facilitates the ability to trade AQ, because other Shippers can use the AQ for different transport routes (using different Welded Points) as long as they are in the same AQ Zone. This would make it easier if there was ever a need for a market, compared with finding a buyer and seller of a specific point-to-point route.

(h) If a shipper does not nominate its full AQ quantity (for a day) then the unused priority capacity for that AQ becomes available (on that day) for use by other shippers under common carriage rules. However, the shipper who holds the AQ still pays the AQ fee. This means AQ is not susceptible to hoarding as there is no incentive for shippers to bid for capacity in excess of their actual needs. It also represents priority capacity on a daily use-it-or-lose-it basis. Therefore AQ has both long-term and short-term congestion management.
(i) If the sum of all nominations exceeds pipeline capacity then those nominations are curtailed until they match pipeline capacity. Shippers’ nominations are reduced using an agreed formula. Shippers with AQ have priority over non-AQ nominations. The result is that shippers (other than first-time shippers) are always allocated at least some of the pipeline capacity they make a nomination for. Curtailment is expected to occur only on a handful of days per year. In MDL’s view, this is a transparent interruptible mechanism which already exists.

2.2 AQ allows each shipper to manage its individual exposure to congestion risk (proportion of non-AQ to AQ). Each shipper is incentivised to select the proportion of its total peak nominations which are made on a non-interruptible basis, and consequently what proportion is made on an interruptible basis. E.g. the dairy industry might take all interruptible because their peak is not coincident with the system peak.

3. Liquidated damages

3.1 Because the MPOC allocates gas to shippers according to their approved nominations, there is no way for shippers to transport more or less gas than they nominate. The MPOC places responsibility for balancing the sum of nominations and physical gas flows (known as operational imbalances) on welded parties.

3.2 If a shipper needs to transport a quantity of gas above its AQ for a day it can submit its nominations for that higher quantity, and if there is sufficient capacity these nominations will be approved. If there is insufficient capacity to transport all nominations the standard curtailment rules will apply to allocate available capacity. This means that if there is capacity available a shipper will not be discouraged from using it by high fees. Encouraging full utilisation of the pipeline’s physical capacity is fundamental to improving allocative efficiency.

4. Dynamic efficiency incentives

4.1 Due to the commercial nature of AQ (i.e. it is paid for even if not used, and it is lost if not used), if an AQ-like mechanism was introduced on the VTS the level of priority capacity held by incumbents would be expected to reduce from the current capacity levels, especially for shippers whose peak is not tightly correlated to the market peak. Shippers holding AQ whose demand for capacity has decreased should seek to sell unused AQ on the secondary market to mitigate losses. If there are no buyers then there will be sufficient capacity to meet shipper demand. If there are buyers then the price will signal that capacity is scarce.

4.2 MDL’s understanding of the investment incentives created by the AQ model are summarised in the diagram below.
Diagram 1

AQ holders

- Market price more than benefit of AQ to AQ holder
  - Sell AQ

- Market price less than benefit of AQ to AQ holder
  - Retain AQ

  - Sufficient supply of AQ
    - Market price of AQ is constant
      - Price greater than MCE
        - INVEST

  - Excess demand for AQ Available
    - Market price of AQ rises
      - Price lower than MCE
## 5. Summary of AQ product

Capitalised terms used in this summary have a corresponding meaning to the same term in the MPOC.

<table>
<thead>
<tr>
<th>Product</th>
<th>A Nominated Quantity that is within a Shipper's AQ will have priority over any Shipper's non-AQ Nominated Quantities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>An AQ gives the holder priority over pipeline capacity in one AQ Zone. There are two zones:</td>
</tr>
<tr>
<td></td>
<td>A – from the Oaonui Welded Point to the inlet of the Mokau compressor station; and</td>
</tr>
<tr>
<td></td>
<td>B – from the outlet of the Mokau compressor station to the Rotowaro Welded Point.</td>
</tr>
<tr>
<td>Term</td>
<td>The term of each AQ ends on the Expiry Date, which is 30 September in any year agreed by MDL and the Shipper. There is no limitation on the length of the term, except that an Expiry Date after 30 September 2020 must be notified by MDL to all Shippers on the MDL IX.</td>
</tr>
<tr>
<td>Volume</td>
<td>Every Shipper must agree an AQ with MDL, which may be zero. MDL will make AQ volumes available to Shippers up to a maximum of 70% of MDL's calculation of the capacity of the MTS in each AQ Zone.</td>
</tr>
<tr>
<td>Firmness</td>
<td>MDL warrants there will be sufficient capacity in the MTS to transport all AQs on any day that is not affected by a Force Majeure Event, Contingency Event or Maintenance (Pipeline Event). To the extent that a Shipper's Approved Quantity on a day is within its AQ, AQ may provide further reliability on a day affected by a Pipeline Event. For example, if the Mokau compressor fails and pipeline capacity is reduced, a Shipper's Approved Nominations that are within its AQ will only be curtailed after all Nominated Quantities that are outside Shippers' AQs have already been curtailed to zero. However, if a Welded Point is affected by a Force Majeure Event all Shippers' Approved Nominations relating to that Welded Point will be treated equally and reduced prorata. This is because an AQ for an AQ Zone only relates to priority allocation of pipeline capacity and does not give Shippers priority to throughput at any particular Welded Point within that zone.</td>
</tr>
<tr>
<td>Flexibility</td>
<td>On a day MDL will only transport gas that has been nominated by Shippers, confirmed by Welded Parties and approved by MDL in accordance with the MPOC i.e. within the capacity of the pipeline. At present the MTS provides some flexibility to Welded Parties in the form of Peaking Limits and Daily Operational Imbalance Limits at each Welded Point. Running Operational Imbalance Limits provide further flexibility. The costs of providing this flexibility are currently borne by Shippers as part of their standard transmission charges. Welded Parties only incur charges if they go outside the pre-set peaking and Operational Imbalance limits.</td>
</tr>
</tbody>
</table>
### Peaking

An Approved Nomination is a daily product. However, there is some flexibility in that a Shipper can seek to adjust its Approved Nomination in four Intraday Cycles: 12am, 8am, 2pm and 8pm. Whether the adjustment will be approved by MDL will depend on a number of factors. First, there must be sufficient capacity (pre-existing Approved Nominations have a higher priority than intraday Nominated Quantities). All Nominated Quantities (including intraday nominations) must be approved by all affected Welded Parties. Each Welded Point has a Peaking Tolerance that allows gas to flow above or below the hourly Scheduled Quantity (i.e., the sum of the Approved Nominations) at that Welded Point.

### Pricing

Shippers on the MTS pay throughput charges. There are two tariffs:

- **Tariff 1** provides MDL with a return on the regulatory asset base.
- **Tariff 2** recovers MDL’s allowable operating costs. Both tariffs are allocated to Shippers’ Approved Nominations. Tariff 1 is charged on Approved Nominations’ volume and distance travelled. Tariff 2 is charged on Approved Nominations’ volume delivered. The MPOC provides that Shippers will pay an AQ Fee (which is calculated at the Tariff 1 rate for the full length of the relevant AQ zone) in relation to every Day regardless of a Shippers Approved Nominations on that Day. The purpose of this is to discourage AQ hoarding so that Shippers only purchase the AQ that they need. There is one issue of the AQ pricing regime that may need to be amended. Currently the MPOC provides that MDL will negotiate a discount off the AQ Fee with each Shipper based on the financial value to MDL of having increased certainty of cash flow during the term of the AQ. MDL believes that this provision may have the unintended, and potentially anti-competitive, consequence of making AQ cheaper for large users. Further, it is not conducive to efficient investment.

### Allocation

Prior to allocating AQs, MDL is required to obtain the GIC’s approval for the queuing rules that it will use for such allocation. There are four broad options 1) first come first served, 2) prorated allocations, 3) historical usage and 4) auction of different types of products (i.e., various combinations of zone, term and volume). MDL does not have a preference for the preferred queuing rules and intends to consult with all affected parties before making a recommendation to GIC.

### Congestion

Congestion on the MTS is managed in the short term through a nominations regime coupled with a priority curtailment mechanism, and in the long-term through an AQ price signal, a developable capacity framework and the customised price path option.

Capacity is allocated on a daily (as distinct from yearly) basis in the form of a Shipper’s Approved Nominations. On days of congestion (i.e., peak demand) MDL warrants to deliver the Approved Nominations of those Shippers with AQ except in the case of FM, a Contingency Event or Maintenance, and non-AQ Approved Nominations will be curtailed based on historical usage down to the
level of available capacity. Those Shippers that want certainty (such as for long-term investment) can therefore purchase AQ in order to maximise their priority in the queue to transport their gas.

Assuming AQ is auctioned and then traded on an open secondary market (which the MPOC allows) a price signal will indicate a need for MDL to consider developing further capacity. If MDL invests in creating new capacity its investment will be caught under the price control regime. To the extent that MDL must anticipate future demand by building excess capacity before new gas comes on stream, the method of calculating MDL’s return from the pipeline may need to be addressed with the Commerce Commission – as noted by the PEA.