

Damhead Creek 2 PARCA ExCS Informal Notice - Appendix 1

19 April 2017

Our Ref: 2017 - Damhead Creek 2 - PARCA

This Appendix relates to the proposed substitution of NTS Exit Capacity from Shorne, Farningham and Tatsfield NTS Exit Points to Damhead Creek 2 power station¹.

1. Recipient selection:

The PARCA application in respect of Damhead Creek 2 power station at Middle Stoke for Enduring Annual NTS Exit (Flat) Capacity triggered a PARCA Exit Window. During that PARCA Exit Window no further application was received.

2. Donor selection:

Substitution from individual donor NTS Exit Points was assessed by reducing the capacity at the most favourable NTS Exit Points that had Substitutable Capacity. The most favourable donor NTS Exit Points will normally be the furthest downstream NTS Exit Points from the recipient NTS Exit Point as measured by pipeline distance.

For the purposes of the NTS Exit Capacity Substitution analysis, five (5) sequences of NTS Exit points were analysed to determine the best exchange rate.

The exit points identified as potential donor sites were as follows;

Exit Zone	NTS Exit Point	Obligated Capacity (GWh/d)	Unsold Capacity (at 1st October 2016)(GWh/d)
South East	Coryton	38.6	38.60
	Farningham	135.12	48.50
	Horndon	46.41	13.10
	Shorne	67.06	18.78
	Tatsfield	221.74	28.97

The pipeline distances to the potential donor NTS Exit Points are:

¹ Middle Stoke (Damhead Creek, aka Kingsnorth Power Station) NTS exit point as per the National Grid Gas PLC Gas Transporter Licence in Respect of the NTS.

² To accommodate a wider tolerance which was requested for reservation for the Damhead Creek 2 power station, and maintain best exchange rates, the capacity reservation has been split into two tranches. The best exchange rate in the analysis was at Shorne. However, Shorne does not have enough unsold capacity to satisfy the upper tolerance. Hence the first tranche is substitution from Shorne. This gives Scottish Power the flexibility to reserve lower capacity levels up to 17,941,083 kWh/d (the maximum that can be substituted from Shorne). For the upper tolerance (28,193,017 kWh/d), the best exchange rate is at Tatsfield and Farningham. Hence, the second tranche is substitution from these two exit point, and gives

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From	To	Pipeline distance (km)
Middle Stoke (Damhead)	Coryton	23.86
	Farningham	29.44
	Horndon	27.92
	Shorne	14.92
	Tatsfield	54.47

As a result of these analyses, capacity will be reserved in two tranches², the final NTS Exit Points selected were as follows;

a. *Tranche 1 : For capacity reservation up to 17,941,083 kWh/d*

NTS Exit Point	Type	Recipient / Donor	Current Baseline (kWh/d)	Proposed Baseline (kWh/d)	Remaining unsold capacity (kWh/d)
Middle Stoke (Damhead)	DC	Recipient	95,336,184	113,277,267	0
Shorne	DN	Donor	67,060,000	48,279,307	0

In accordance with paragraph 62 of the methodology the individual donor NTS Exit Point to recipient NTS Exit Point exchange rate was determined and is as follows:

Donor NTS Exit Points	Exchange Rate Recipient : Donor
Shorne	1 : 1.0468

b. *Tranche 2 : for the additional capacity reservation of 10,251,934kWh/d. This gives flexibility to vary the capacity requirement from 17,941,084kWh/d up to the upper tolerance of 28,193,017kWh/day*

² To accommodate a wider tolerance which was requested for reservation for the Damhead Creek 2 power station, and maintain best exchange rates, the capacity reservation has been split into two tranches. The best exchange rate in the analysis was at Shorne. However, Shorne does not have enough unsold capacity to satisfy the upper tolerance. Hence the first tranche is substitution from Shorne. This gives Scottish Power the flexibility to reserve lower capacity levels up to 17,941,083 kWh/d (the maximum that can be substituted from Shorne). For the upper tolerance (28,193,017 kWh/d), the best exchange rate is at Tatsfield and Farningham. Hence, the second tranche is substitution from these two exit point, and gives flexibility to reserve capacity up to the maximum requested

<i>NTS Exit Point</i>	<i>Type</i>	<i>Recipient / Donor</i>	<i>Current Baseline (kWh/d)</i>	<i>Proposed Baseline (kWh/d)</i>	<i>Remaining unsold capacity (kWh/d)</i>
Middle Stoke (Damhead)	DC	Recipient	95,336,184	123,529,201	0
Tatsfield	DN	Donor	67,060,000	57,058,113	8,778,806
Farningham	DN	Donor	135,120,000	134,869,953	48,246,546

In accordance with paragraph 62 of the methodology the individual donor NTS Exit Point to recipient NTS Exit Point exchange rate was determined and is as follows:

<i>Donor NTS Exit Points</i>	<i>Exchange Rate Recipient : Donor</i>
Tatsfield	1 : 1.0508
Farningham	1 : 1.0562

3. Network analysis: Supply & demand scenario

- Substitution analysis was conducted for the Gas Year 2020/21 as the first year of the enduring exit capacity period for which substitution could be effected, based on our understanding of the customer's required timescales at that point in time.
- The analysis starting point is our 2020/21 1-in-20 peak day demand network. From this a South East sensitivity network is created, taking the most onerous credible demand levels for power stations and DN offtakes from sold and forecast levels for the South East exit zone as detailed in Section 5, and with Isle of Grain supplies reduced to a credible minimum.
- The substitution network is created from the South East sensitivity network, with the potential donor distribution network NTS Exit Points in the area increased to obligation in accordance with the Methodology, as these were deemed to have a reasonable probability of being donors.
- Middle Stoke (Damhead) NTS Exit Point was set at the level of prevailing Obligated Exit Capacity in 2020 (95,336,184 kWh/d).

4. Enhanced Network

System enhancements for the substitution network were as follows;

- Pipeline reinforcement Tatsfield to Morningthorpe
- Cambridge compressor flow modification

5. Exit points set at obligated, sold or otherwise:

- All South East Direct Connect sites are set at obligated level, with the remaining Direct Connects being scaled back from the forecast so that the aggregate total matches the forecast total.
- Sites increased to their obligated level as part of the South East sensitivity network are the potential donors (DN offtakes) listed above; none of these sites had already been set to their obligated level.

- All other DN NTS Exit Points are at Sold level as booked through the annual NTS Exit (Flat) Capacity application processes.

6. Flow adjustments:

- Flow adjustments were made in accordance with Paragraph 45 of the Methodology.
- Flow adjustments are detailed in Section 3 above, the substitution network demand is 517 GWh/d, which is higher than the 1 in 20 peak demand (including sold capacity levels at DN NTS Exit Points).

7. Remaining unsold NTS Exit (Flat) Capacity at the donor NTS Exit Points:

If substitution is effected as stated in this notice on 1st October, 2020, the remaining unsold Annual NTS Exit (Flat) Capacity at the donor exit points is shown in the following tables.

Tranche 1

Donor NTS Exit Points	Type	Unsold capacity at donor exit points in kWh/d (Post-2020) Middle Stoke Damhead capacity reservation)
Shorne	DN	0

Tranche 2

Donor NTS Exit Points	Type	Unsold capacity at donor exit points in kWh/d (Post-2020) Middle Stoke Damhead capacity reservation)
Tatsfield	DN	8,778,806
Farningham	DN	48,246,546

8. Summary of network analysis key parameter changes:

- The donor/recipient offtakes are sufficiently far from compression/pressure reduction facilities that no significant parameter changes were required between substitution networks.

9. Exchange Rate Validation

In order to validate that the above donor list and the sequence of substitution provides the best exchange rate, five different donor sequences were assessed, for the 17,941,083 kWh/d and the 28,193,017 kWh/d capacity reservations. These are listed, with their respective exchange rates, in the following tables:

For capacity reservation up to 17,941,083 kWh/d

Sequence 1

Donor Exit Point (s)	Capacity Donated (kWh/d)	Capacity Received (kWh/d)	Exchange Rate (Recipient : Donor)
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Tatsfield	18,793,666	17,941,083	1 : 1.0475
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Sequence 2

Donor Exit Point (s)	Capacity Donated (kWh/d)	Capacity Received (kWh/d)	Exchange Rate (Recipient : Donor)
Farningham	18,783,000	17,941,083	1 : 1.0469

Sequence 3 (preferred)

Donor Exit Point (s)	Capacity Donated (kWh/d)	Capacity Received (kWh/d)	Exchange Rate (Recipient : Donor)
Shorne	18,780,693	17,941,083	1 : 1.0468

Sequence 4

Donor Exit Point (s)	Capacity Donated (kWh/d)	Capacity Received (kWh/d)	Exchange Rate (Recipient : Donor)
Coryton	20,806,250	17,941,083	1 : 1.1597

Sequence 5

Donor Exit Point (s)	Capacity Donated (kWh/d)	Capacity Received (kWh/d)	Exchange Rate (Recipient : Donor)
Horndon	13,102,331	11,117,817	1 : 1.1785
Coryton	7,964,417	6,823,267	1 : 1.1672
Total	21,066,748	17,941,083	1 : 1.1742

For capacity reservation above 17,941,083 kWh/d up to 28,193,017 kWh/d

Sequence 1 (preferred)

Donor Exit Point (s)	Capacity Donated (kWh/d)	Capacity Received (kWh/d)	Exchange Rate (Recipient : Donor)
Tatsfield	28,967,250	27,566,175	1 : 1.0508
Farningham	662,083	626,842	1 : 1.0562
Total	29,629,333	28,193,017	1 : 1.0509

Sequence 2

Donor Exit Point (s)	Capacity Donated (kWh/d)	Capacity Received (kWh/d)	Exchange Rate (Recipient : Donor)
Farningham	29,633,992	28,193,017	1 : 1.0511

Sequence 3

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Donor Exit Point (s)	Capacity Donated (kWh/d)	Capacity Received (kWh/d)	Exchange Rate (Recipient : Donor)
Shorne	18,780,693	17,911,942	1 : 1.0485
Coryton	12,001,783	10,281,075	1 : 1.1674
Total	30,782,476	28,193,017	1 : 1.0918

Sequence 4

Donor Exit Point (s)	Capacity Donated (kWh/d)	Capacity Received (kWh/d)	Exchange Rate (Recipient : Donor)
Coryton	32,850,685	28,193,017	1 : 1.1652

Sequence 5

Donor Exit Point (s)	Capacity Donated (kWh/d)	Capacity Received (kWh/d)	Exchange Rate (Recipient : Donor)
Horndon	13,102,375	11,117,817	1 : 1.1785
Coryton	20,003,717	17,075,200	1 : 1.1715
Total	33,106,092	28,193,017	1 : 1.1743