

METER ERROR REPORT**FINAL**

Reconcile?	Y
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Safety Issue?	Y/N
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Thesis Report No.	
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1. EXECUTIVE SUMMARY

SITE NAME	Braishfield A	
LDZ	SO	
START DATE (actual)		
LAST GOOD DATE	30 th September 2010	
END DATE	30 th June 2011	
SIZE OF ERROR (No reconciliation required if under 0.1%)	0.1044% under-registration	
ESTIMATE – Y/N?		
ROOT CAUSE	Failed validation check for low DP and ADC transmitter	
ANALYSIS	Recalculation of volumes using corrected low DP and ADC	
METER TYPE	Orifice	
AUTHOR	H. Colbourne	
CHECKED BY	B. Kirkman	
ACCEPTED BY SGN NETWORK		
RECONCILIATION	Distribution	Transportation

2. BACKGROUND

Braishfield A has a single orifice plate meter stream using a gas chromatograph for CV determination and PTZ correction.

The differential pressure (DP) across the orifice plate is measured using two DP transmitters. One low ranged up to 50 mbar and one high ranged up to 500 mbar. The correct transmitter is automatically selected by the flow computer, switching up at 47.5 mbar and switching down at 45 mbar. A third standby DP transmitter is provided for discrepancy checking.

During the annual validation the CP4b (ADC (Low DP) Check) test failed on 29th June 2011 and CP11a (Low DP Transmitter Check) test failed on 30th June 2011, both subsequently passing following re-calibration.

3. ERROR QUANTIFICATION AND IMPACT

The low DP ADC transmitter and the low DP measurements were corrected for the 'As Found' errors shown in Table 1 and 2 when the recorded measurement was in the appropriate range. The high DP measurement was not corrected.

Corrected DP (mbar)	CP11a Error (% span)	CP4b Error (% span)	Combined Error (% span)
0	-0.20905	-0.0531	-0.2622
12.51	-0.257	-0.0539	-0.3109
25.01	-0.34785	-0.0546	-0.40245
37.52	-0.39425	-0.0670	-0.46125
50.03	-0.4007	-0.0950	-0.4957

Table 1 – LDP As Found errors (30th September 2010 to 29th June 2011)

Corrected DP (mbar)	CP11a Error (% span)	CP4b Error (% span)	Combined Error (% span)
0	-0.20905	0.0007	-0.2084
12.51	-0.257	-0.0052	-0.26215
25.01	-0.34785	-0.0019	-0.349725
37.52	-0.39425	-0.0011	-0.39535
50.03	-0.4007	-0.0001	-0.400825

Table 2 – LDP As Found errors (29th June 2011 to 30th June 2011)

The flow rates and daily volumes were recalculated using the measured DP and the corrected DP. The error was calculated on a daily basis as the difference between volume totals using measured and corrected DP.

The overall error is an under-registration of 0.1044 %.

4. CAUSES

Low DP transmitter and Low DP ADC transmitter check failed during routine validation.

5. RECOMMENDATIONS AND LEARNING

Failures of this type will occur occasionally, if the same checks fail regularly then it suggests a fundamental problem with the equipment being tested and repairs or replacements should be made.

The start of the error cannot be identified therefore the total error to be reconciled should be halved in accordance with the Offtake Arrangements Document. Appendix A shows the daily correction factors, which have already been halved. On 29th June 2011 RBD data was not recorded for a period of 3 hours. A correction factor has been applied to this day based on the average of the correction factors for one day before and one day after this date (i.e. average of 28th and 30th June 2011).

REFERENCES

HPMIS Database

BraishfieldA_SO011_Data.xls – calculation spreadsheet

BraishfieldA_SO011_Summary.xls – results spreadsheet

VERSION HISTORY

<i>Version</i>	<i>Changes</i>	<i>Author</i>	<i>Date</i>
O	<i>Original</i>	<i>H.Colbourne</i>	<i>25/03/2013</i>

DISTRIBUTION

Scotia Gas Networks

APPENDIX A – Daily Correction Factors

The daily correction factors shown below have been halved in accordance with the Offtake Arrangements Document because the start date of the errors are unknown.

*On 29th June 2011 RBD data was not recorded for a period of 3 hours. A correction factor has been applied to this day based on the average of the correction factors for one day before and one day after this date (i.e. average of 28th and 30th June 2011).

Gas Day	Daily Correction Factor
30/09/2010	1.001522
01/10/2010	1.007243
02/10/2010	1.000000
03/10/2010	1.000000
04/10/2010	1.027324
05/10/2010	1.001689
06/10/2010	1.002371
07/10/2010	1.002182
08/10/2010	1.000000
09/10/2010	1.000000
10/10/2010	1.001109
11/10/2010	1.002656
12/10/2010	1.002750
13/10/2010	1.002177
14/10/2010	1.001774
15/10/2010	1.001985
16/10/2010	1.001378
17/10/2010	1.000539
18/10/2010	1.001483
19/10/2010	1.001141
20/10/2010	1.001858
21/10/2010	1.001297
22/10/2010	1.001366
23/10/2010	1.002805
24/10/2010	1.002280
25/10/2010	1.001213
26/10/2010	1.000483
27/10/2010	1.002859
28/10/2010	1.000000
29/10/2010	1.000000
30/10/2010	1.002445
31/10/2010	1.000991
01/11/2010	1.001974
02/11/2010	1.002615
03/11/2010	1.002293
04/11/2010	1.002694

Gas Day	Daily Correction Factor
05/11/2010	1.002705
06/11/2010	1.001376
07/11/2010	1.002170
08/11/2010	1.001310
09/11/2010	1.000421
10/11/2010	1.000301
11/11/2010	1.000448
12/11/2010	1.000367
13/11/2010	1.002046
14/11/2010	1.001215
15/11/2010	1.000030
16/11/2010	1.000038
17/11/2010	1.000334
18/11/2010	1.000922
19/11/2010	1.000843
20/11/2010	1.000431
21/11/2010	1.000391
22/11/2010	1.000245
23/11/2010	1.000331
24/11/2010	1.000223
25/11/2010	1.000020
26/11/2010	1.000000
27/11/2010	1.000000
28/11/2010	1.000000
29/11/2010	1.000000
30/11/2010	1.000000
01/12/2010	1.000000
02/12/2010	1.000000
03/12/2010	1.000000
04/12/2010	1.000139
05/12/2010	1.000005
06/12/2010	1.000000
07/12/2010	1.000000
08/12/2010	1.000000
09/12/2010	1.000000
10/12/2010	1.000315

Gas Day	Daily Correction Factor
11/12/2010	1.000588
12/12/2010	1.000349
13/12/2010	1.000045
14/12/2010	1.000142
15/12/2010	1.000033
16/12/2010	1.000005
17/12/2010	1.000000
18/12/2010	1.000000
19/12/2010	1.000000
20/12/2010	1.000000
21/12/2010	1.000042
22/12/2010	1.000317
23/12/2010	1.000000
24/12/2010	1.000000
25/12/2010	1.000000
26/12/2010	1.000131
27/12/2010	1.000000
28/12/2010	1.000000
29/12/2010	1.000409
30/12/2010	1.000372
31/12/2010	1.000133
01/01/2011	1.000448
02/01/2011	1.000011
03/01/2011	1.000000
04/01/2011	1.000000
05/01/2011	1.000113
06/01/2011	1.000101
07/01/2011	1.000000
08/01/2011	1.000000
09/01/2011	1.000000
10/01/2011	1.000000
11/01/2011	1.000000
12/01/2011	1.000125
13/01/2011	1.000449
14/01/2011	1.000000
15/01/2011	1.000444
16/01/2011	1.001651
17/01/2011	1.000772
18/01/2011	1.000073
19/01/2011	1.000000
20/01/2011	1.000013
21/01/2011	1.000000
22/01/2011	1.000019
23/01/2011	1.000268
24/01/2011	1.000299
25/01/2011	1.000076

Gas Day	Daily Correction Factor
26/01/2011	1.000373
27/01/2011	1.000004
28/01/2011	1.000000
29/01/2011	1.000000
30/01/2011	1.000000
31/01/2011	1.000000
01/02/2011	1.000000
02/02/2011	1.000490
03/02/2011	1.000818
04/02/2011	1.000499
05/02/2011	1.000894
06/02/2011	1.000014
07/02/2011	1.000000
08/02/2011	1.000000
09/02/2011	1.000886
10/02/2011	1.000017
11/02/2011	1.001576
12/02/2011	1.000879
13/02/2011	1.000061
14/02/2011	1.000346
15/02/2011	1.000005
16/02/2011	1.000134
17/02/2011	1.000087
18/02/2011	1.000000
19/02/2011	1.000047
20/02/2011	1.000006
21/02/2011	1.000000
22/02/2011	1.000000
23/02/2011	1.000191
24/02/2011	1.001908
25/02/2011	1.001744
26/02/2011	1.000006
27/02/2011	1.000059
28/02/2011	1.000005
01/03/2011	1.000071
02/03/2011	1.000000
03/03/2011	1.000000
04/03/2011	1.000575
05/03/2011	1.000236
06/03/2011	1.000603
07/03/2011	1.000509
08/03/2011	1.000344
09/03/2011	1.000167
10/03/2011	1.000200
11/03/2011	1.000511
12/03/2011	1.002061

Gas Day	Daily Correction Factor
13/03/2011	1.001878
14/03/2011	1.000218
15/03/2011	1.002489
16/03/2011	1.000667
17/03/2011	1.000067
18/03/2011	1.000000
19/03/2011	1.000592
20/03/2011	1.001754
21/03/2011	1.001539
22/03/2011	1.002250
23/03/2011	1.002376
24/03/2011	1.001473
25/03/2011	1.002459
26/03/2011	1.001733
27/03/2011	1.001064
28/03/2011	1.001231
29/03/2011	1.000437
30/03/2011	1.000026
31/03/2011	1.000340
01/04/2011	1.001616
02/04/2011	1.002222
03/04/2011	1.001744
04/04/2011	1.001537
05/04/2011	1.001104
06/04/2011	1.002442
07/04/2011	1.002633
08/04/2011	1.003196
09/04/2011	1.003178
10/04/2011	1.026612
11/04/2011	1.002498
12/04/2011	1.001990
13/04/2011	1.000605
14/04/2011	1.000646
15/04/2011	1.002383
16/04/2011	1.001942
17/04/2011	1.002506
18/04/2011	1.002065
19/04/2011	1.002800
20/04/2011	1.000000
21/04/2011	1.000000
22/04/2011	1.003137
23/04/2011	1.002840
24/04/2011	1.002926
25/04/2011	1.001880
26/04/2011	1.002906
27/04/2011	1.002977

Gas Day	Daily Correction Factor
28/04/2011	1.002916
29/04/2011	1.003040
30/04/2011	1.000000
01/05/2011	1.000000
02/05/2011	1.000000
03/05/2011	1.003637
04/05/2011	1.002101
05/05/2011	1.002913
06/05/2011	1.002316
07/05/2011	1.000000
08/05/2011	1.000000
09/05/2011	1.000000
10/05/2011	1.001905
11/05/2011	1.000000
12/05/2011	1.000000
13/05/2011	1.000000
14/05/2011	1.000000
15/05/2011	1.001827
16/05/2011	1.003720
17/05/2011	1.012094
18/05/2011	1.000000
19/05/2011	1.000000
20/05/2011	1.003059
21/05/2011	1.000000
22/05/2011	1.000000
23/05/2011	1.002748
24/05/2011	1.002703
25/05/2011	1.003017
26/05/2011	1.002976
27/05/2011	1.002255
28/05/2011	1.000000
29/05/2011	1.000000
30/05/2011	1.000000
31/05/2011	1.000000
01/06/2011	1.002392
02/06/2011	1.002085
03/06/2011	1.000000
04/06/2011	1.001804
05/06/2011	1.000000
06/06/2011	1.000000
07/06/2011	1.000000
08/06/2011	1.000000
09/06/2011	1.015434
10/06/2011	1.002559
11/06/2011	1.001357
12/06/2011	1.000000

Gas Day	Daily Correction Factor
13/06/2011	1.000000
14/06/2011	1.000000
15/06/2011	1.000000
16/06/2011	1.000000
17/06/2011	1.000000
18/06/2011	1.000000
19/06/2011	1.000000
20/06/2011	1.000000
21/06/2011	1.000000
22/06/2011	1.000000
23/06/2011	1.000000
24/06/2011	1.000000
25/06/2011	1.000000
26/06/2011	1.000000
27/06/2011	1.000000
28/06/2011	1.003614
*29/06/2011	1.003347
30/06/2011	1.003079