Department
for Environment
Food & Rural Affairs

Report on measures for 2016 exceedance of the Target Value for Benzo[a]pyrene in Northern Ireland non-agglomeration zone (UK0043)

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Any enquiries regarding this publication should be sent to us at

Air Quality and Industrial Emissions
Department for Environment, Food and Rural Affairs
Ground Floor, Seacole Building
2 Marsham Street
London, SW1P 4DF

Email: air.quality@defra.gsi.gov.uk

With technical input from Ricardo Energy & Environment

www.gov.uk/defra

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1. Introduction

1.1 Context

Under the EU Directive 2004/107/EC[1], the target value (TV) for Benzo[a]pyrene (B[a]P) is an annual mean concentration of 1 nanogram (one billionth of a gram (10^{-9})) per cubic metre (m^{-3}) of ambient air or lower. The Directive requires that Member States report on measures in place to address the exceedance of the TV and that all reasonable measures that do not entail disproportionate cost should be taken to ensure this target is not exceeded.

2016 is the first reported exceedance of the TV in the Northern Ireland non-agglomeration zone since the TV came into force after 31 December 2012.

1.2 Status of zone

This is the report on measures required for exceedances of the TV for B[a]P within the Northern Ireland zone identified within the 2016 UK air quality assessment. Exceedances within this zone were identified on the basis of measurement data with model results providing supplementary information. This exceedance was reported via e-Reporting dataflow G[2] on attainment and Air Pollution in the UK[3].

Table 1 summarises the spatial extent and associated resident population for the exceedances identified in this zone, as reported via e-Reporting. An assessment to determine the spatial extent of the exceedance situation and population exceeding the TV was not available at the time that the exceedance was reported.

Table 1. Area exceeding B[a]P target value in 2016 and associated population for zone UK0043

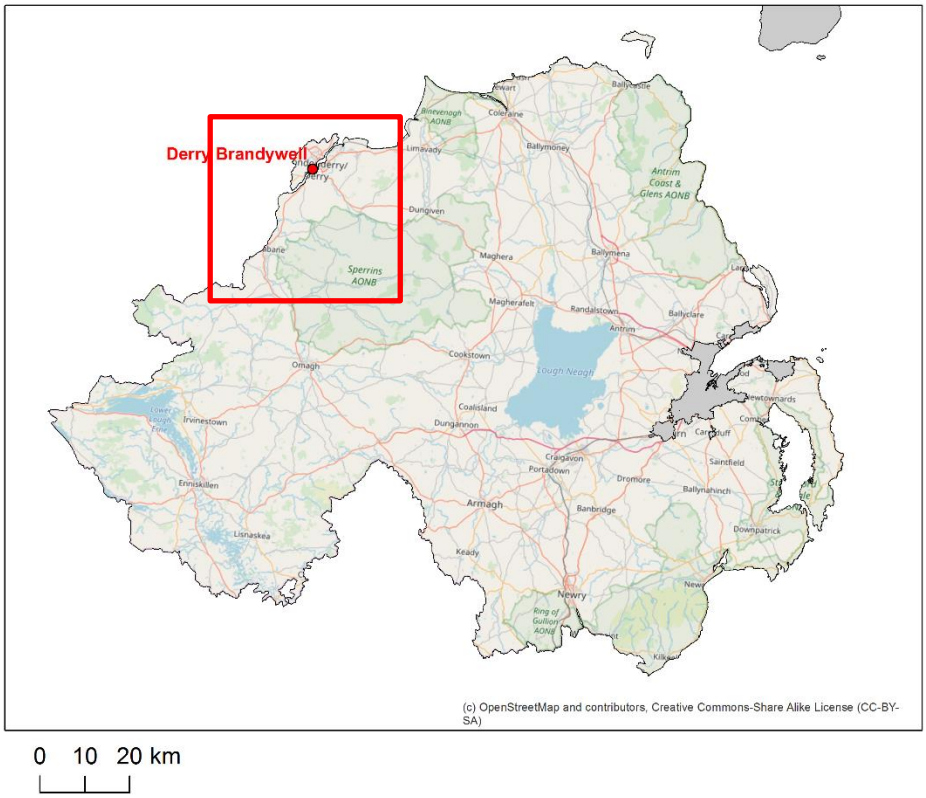
Zone code	Zone Name	Area exceeding TV (km^2)	Population exceeding TV
UK0043	Northern Ireland	None reported	None reported

[1] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:023:0003:0016:EN:PDF
[2] http://cdr.eionet.europa.eu/gb/eu/aqd
[3] http://uk-air.defra.gov.uk/library/annualreport/index

Figure 1a shows the location of the exceedance in the context of the zone as a whole. Figure 1b shows the part of the zone including the exceedances in more detail.

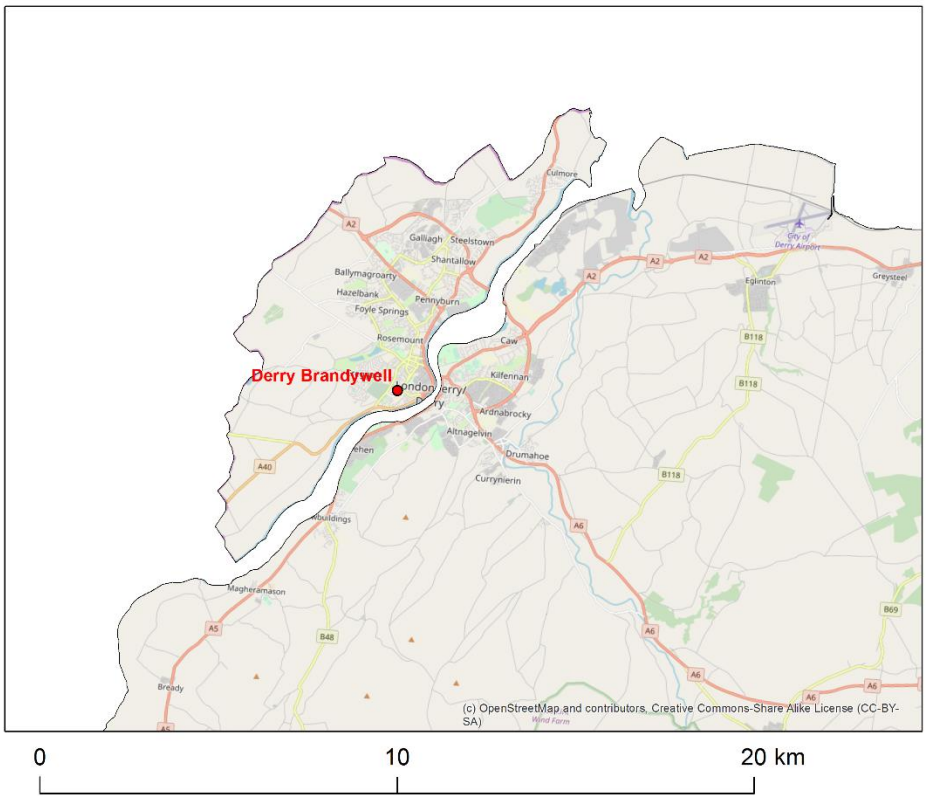
Figure 1. Location of exceedance of the B[a]P target value during 2016 in zone UK0043 Northern Ireland. The location of the exceeding monitoring station is marked red.

a) The whole zone



0 10 20 km

b) The exceedance locations at higher spatial resolution



An initial source apportionment was carried out and this analysis identified one exceedance situation within this zone

- Northern Ireland [B[a]P_UK0043_2016_1] related to domestic emissions

This following section details the exceedance situation in the zone including a description of the exceedance situation, maps, information on source apportionment and a list of measures already taken or to be taken. Information on measures is reported within e-Reporting dataflow K[4].

[4] http://cdr.eionet.europa.eu/gb/eu/aqd

2 Exceedance situation Northern Ireland [B[a]P_UK0043_2016_1] related to industrial emissions

2.1 Description of exceedance

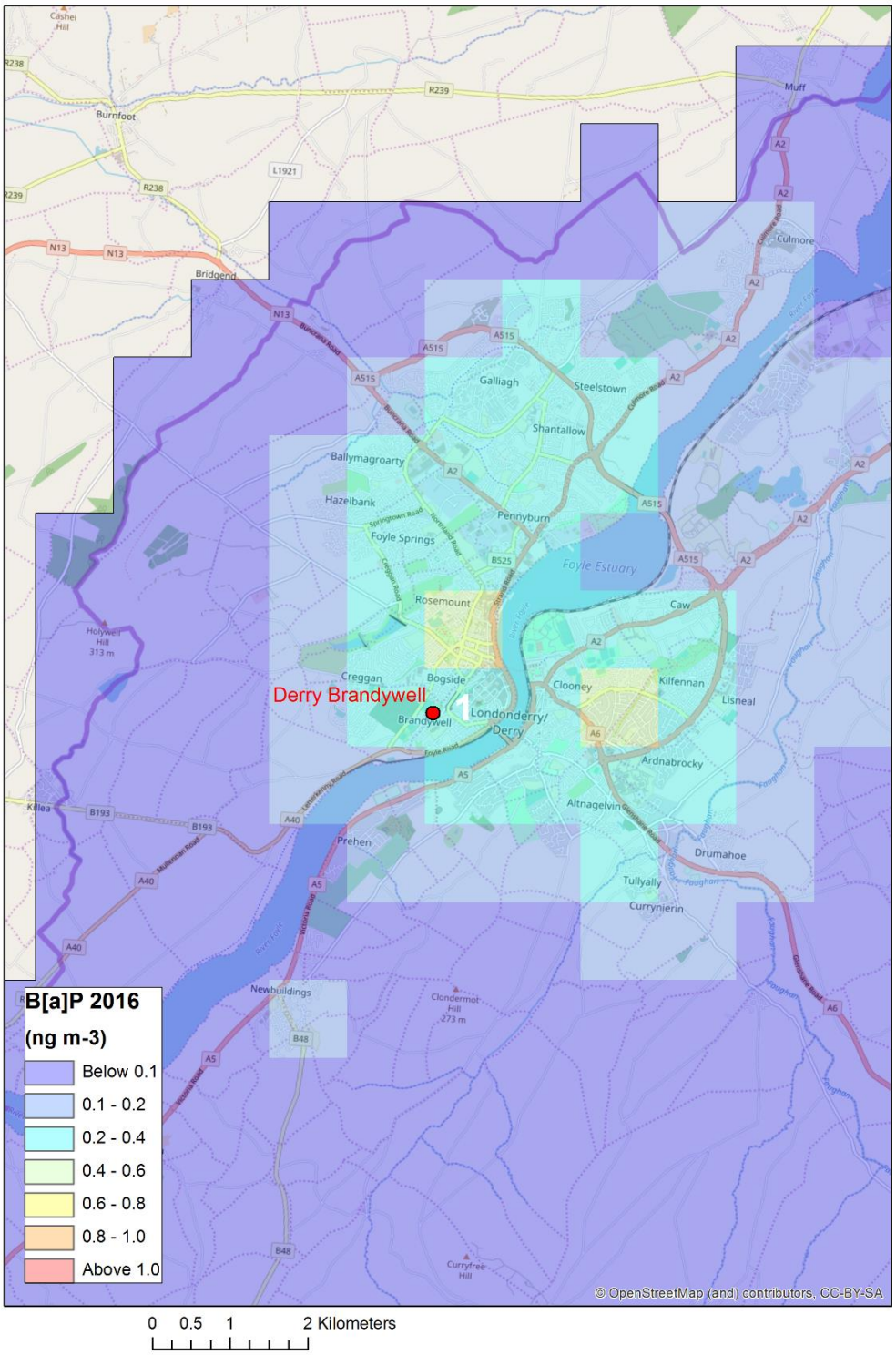
This exceedance situation has been identified by measurement at the Derry Brandywell monitoring station. Figure 2 shows the location of the exceedance situation in more detail. The exceeding grid square is numbered in Figure 2 and in subsequent tables for easy reference. An assessment to determine the spatial extent of the exceedance situation and population exceeding the TV was not available at the time that the exceedance was reported. The resident population within the 1 km grid square in which this monitoring station is located is 4,895.

Table 2 lists the measured concentrations of B[a]P in this zone since 2008.

Table 2. Measured annual mean B[a]P concentrations in Northern Ireland zone UK0043 from 2008 to 2017 (ngm^{-3}). (Percentage data capture is shown in brackets).

Station (EoI code)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Ballymena Ballykeel (GB0934A)	2.5 (94)	1.6 (93)	2.0 (98)	1.1 (99)	1.0 (100)	0.82 (100)	0.79 (100)	0.64 (100)	0.52 (100)	0.64 (100)
Derry Brandywell (GB0944A)	1.3 (98)	1.1 (88)	1.9 (98)	0.95 (89)	0.87 (94)	0.91 (97)	0.85 (100)	0.86 (98)	1.3 (100)	0.86 (100)

Figure 2. Exceedance situation Northern Ireland [B[a]P_UK0043_2016_1]. The location of the exceeding monitoring station is marked red



2.2 Source apportionment

Table 3 provides a breakdown of the main emission sources (source apportionment) that have contributed to the grid squares in this exceedance situation, highlighting the significant contribution from domestic combustion sources. The penultimate column is the total from all emission sources. The values in this column have been rounded to 1 decimal place for consistency with the values used in the compliance assessment. The values in the other columns have not been rounded. The other shaded columns are the subtotals for the regional, urban background and local contributions.

Figure 3 shows the month by month variation in measured B[a]P concentrations at monitoring sites in Northern Ireland during 2016. The highest measured concentrations coincide with the colder months of the year. This is consistent with domestic combustion being the dominant source of the measured concentrations at Derry Brandywell.

The source apportionment presented in Table 3 has been derived from the model results for the 1 km grid square that contains the Derry Brandywell monitoring station suggests that the contribution from domestic combustion is approximately 95% of the total. The model result under-predicts the measured concentration at this location. It is therefore likely that the contribution from domestic combustion is considerably larger and of the order of 95% of the measured concentration of 1.3 ngm^{-3}.

Figure 3 Monthly variation of measured B[a]P concentrations at monitoring stations in Northern Ireland and average regional temperatures in 2016.

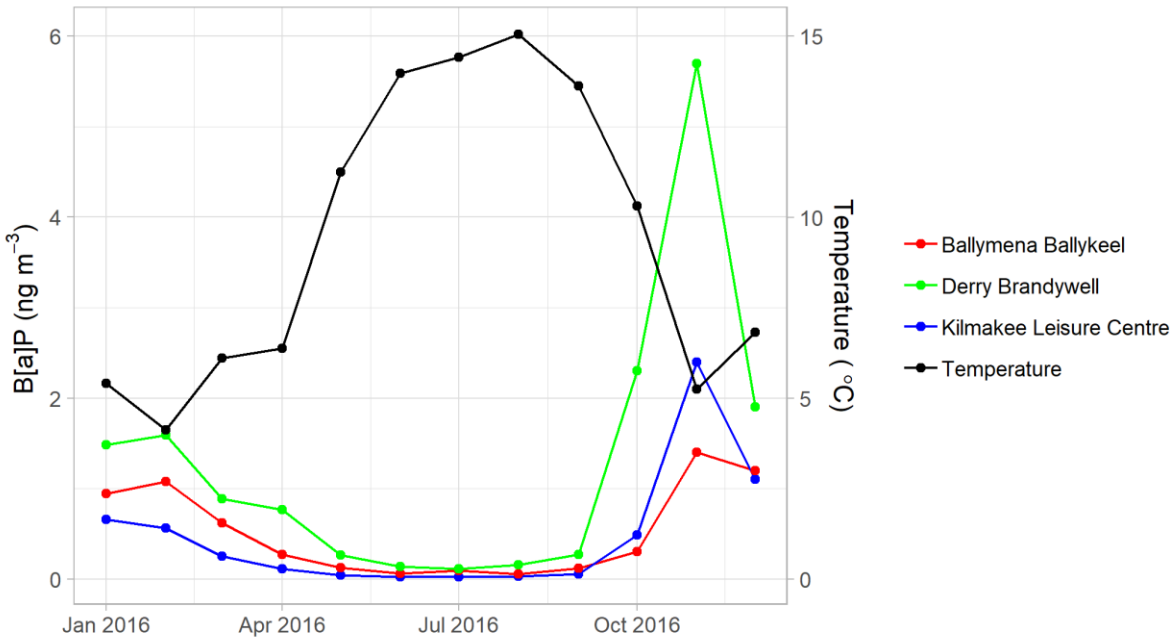


Table 3. Source apportionment for exceedance situation Northern Ireland [B[a]P_UK0043_2016_1]. Annual mean B[a]P concentration (ngm^{-3})

Grid square number	OS easting (m)	OS Northing (m)	Zone	**a) Regional background: Total**	**b) Urban background increment: Total**	Urban background increment: Traffic	Urban background increment: Industry including heat and power production	Urban background increment: commercial and residential	Urban background increment: Shipping	Urban background increment: Off road mobile machinery	Urban background increment: Other	**c) Local increment: Total**	Local increment: Industry including heat and power production	**Total for all emission sources (a+b+c)**	Resident population
1	59500	579500	43	n/a	0.393	0.001	0.003	0.379	0.000	0.000	0.010	n/a	n/a	0.4	4895

2.3 Measures

The exceedance area lies within Derry City & Strabane District Council and officials from the Department of Agriculture, Environment and Rural Affairs are working with council officials to address the issues around the B[a]P exceedance and its predominant source (solid fuel, in particular coal burning).

The Council is running a campaign to raise awareness around Smoke Control in time for the 2018 heating season. The campaign involves a leaflet, a press release and a letter to fuel retailers.

The campaign will raise awareness of the health impacts of air pollution caused by solid fuel burning and of the requirements under law to comply with Smoke Control legislation.

The Department has also made available funding to enable the Council to undertake a comprehensive door-to-door fuel use survey to be carried out in the 2018/19 financial year in key areas. This survey will give a clearer picture of the extent of solid fuel burning and the survey results will assist Council/Department to come to an informed decision on progressing the Smoke Control strategy with the possibility of declaring Smoke Control Areas, in which there are restrictions placed on the burning of certain fuels.