Public Health England

Protecting and improving the nation's health

Environmental monitoring following the Grenfell Tower fire

Data update

23 November 2017

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health, and are a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

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Published November 2017
PHE publications
gateway number: 2017205

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Overview

Public Health England (PHE) has been assessing and monitoring air quality in the area surrounding Grenfell Tower since the start of the fire on 14 June. Initial risk assessments carried out in conjunction with partner agencies, focussed on the smoke plume which rose upwards rapidly and was carried in a northerly direction by the wind. This meant that there was a low risk of impact on local air quality from the fire. Assessment of data from The London Air Quality Monitoring network was used to confirm the initial risk assessment that levels of particulate matter were low, and remained so over the next 10 days.

PHE started additional monitoring of air quality close to Grenfell Tower on 24 June 2017.

Results to date have shown that levels of particulate matter remain low and no asbestos fibres have been detected in areas surrounding Grenfell Tower, therefore current evidence suggests the risk to public health from air pollution remains low.

PHE is monitoring for pollutants that have both short and long term effects to be sure we understand if there is a risk to public health. Some of these results take longer to collect.

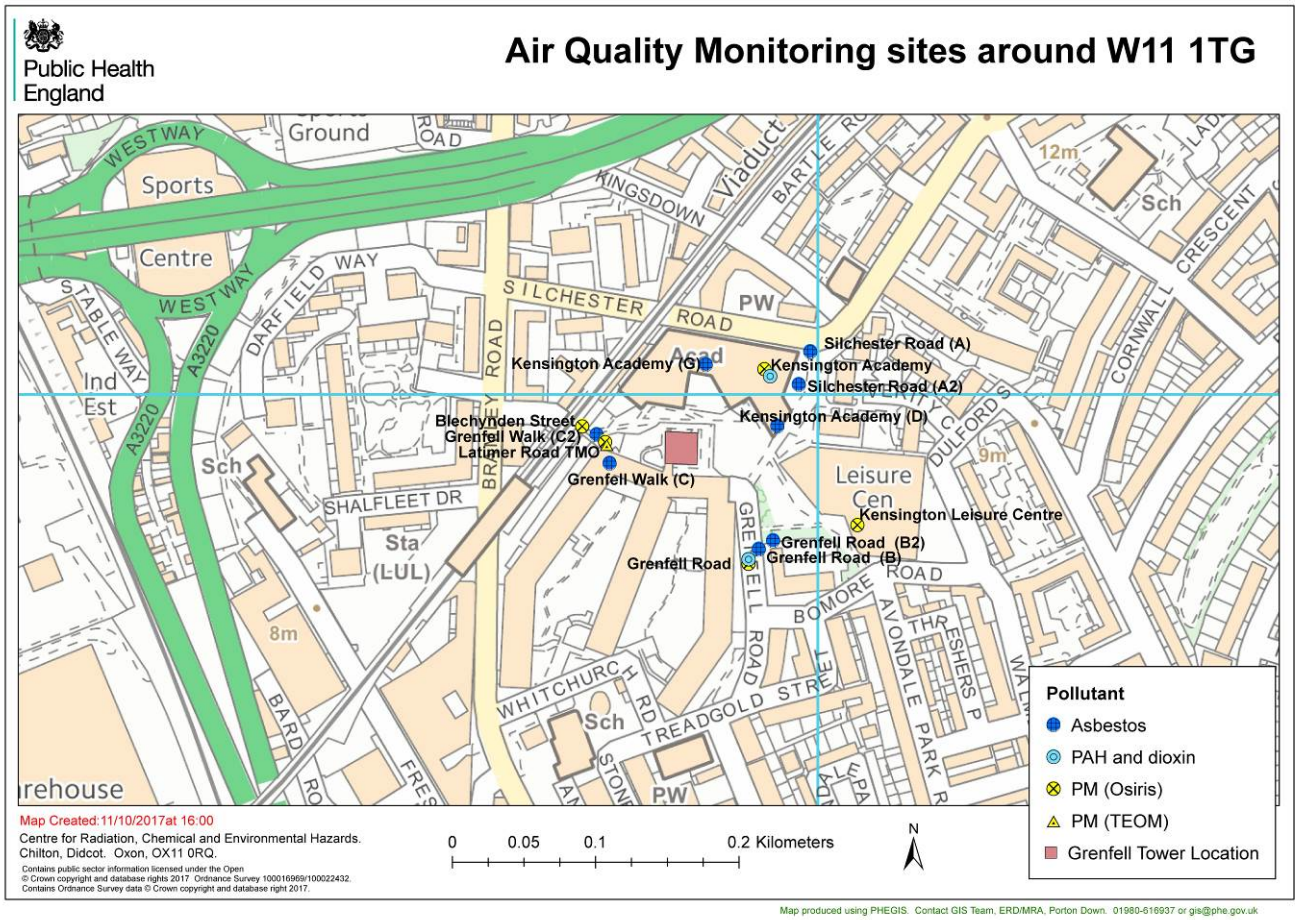
Results to date for dioxins, furans and dioxin-like polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs) are equivalent to background levels for London.

The monitoring strategy has been reviewed and agreed with partners within a multi-agency monitoring group. The samples are collected and analysed by an independent environmental company and the results are assessed by PHE specialist environmental public health scientists.

The environmental monitoring data is shown on the following pages alongside an explanation of the data in terms of potential impacts on health.

The information will be updated regularly as more monitoring data becomes available.

Monitoring locations



The map will be updated regularly as certain monitoring locations, for example for asbestos, will be moved around the site to ensure good coverage based on site activities.

Background to monitoring

PHE has been assessing and monitoring air quality in the area surrounding Grenfell Tower since the fire started. During the initial stages of the fire the main focus for the assessment was on the smoke plume, which rose upwards rapidly and was carried in a northerly direction by the wind.

The London Air Quality Monitoring network was used to assess impacts from particulate matter (PM_{10}) within the smoke plume on air quality in the surrounding area and further away. Further details of the Air Quality monitoring from the closest fixed air quality monitor in North Kensington can be found in Appendix 1.

PHE has reviewed the evidence on the contents of smoke plumes after fires. Although each fire will have specific characteristics, there are common chemicals which are usually released in smoke, such as particulate matter which can be used as a marker for other emissions.

PHE has commissioned monitoring for particulate matter, asbestos, dioxins and polycyclic aromatic hydrocarbons (PAH). The fire is not the only source of these contaminants, there are other sources in the environment for example due to traffic and industrial sources.

However, it is important to ensure that the fire has not resulted in significantly higher levels of these chemicals in the local area and to also ensure that as work progresses on the site, this does not result in notably elevated levels of these contaminants.

Monitoring timeline

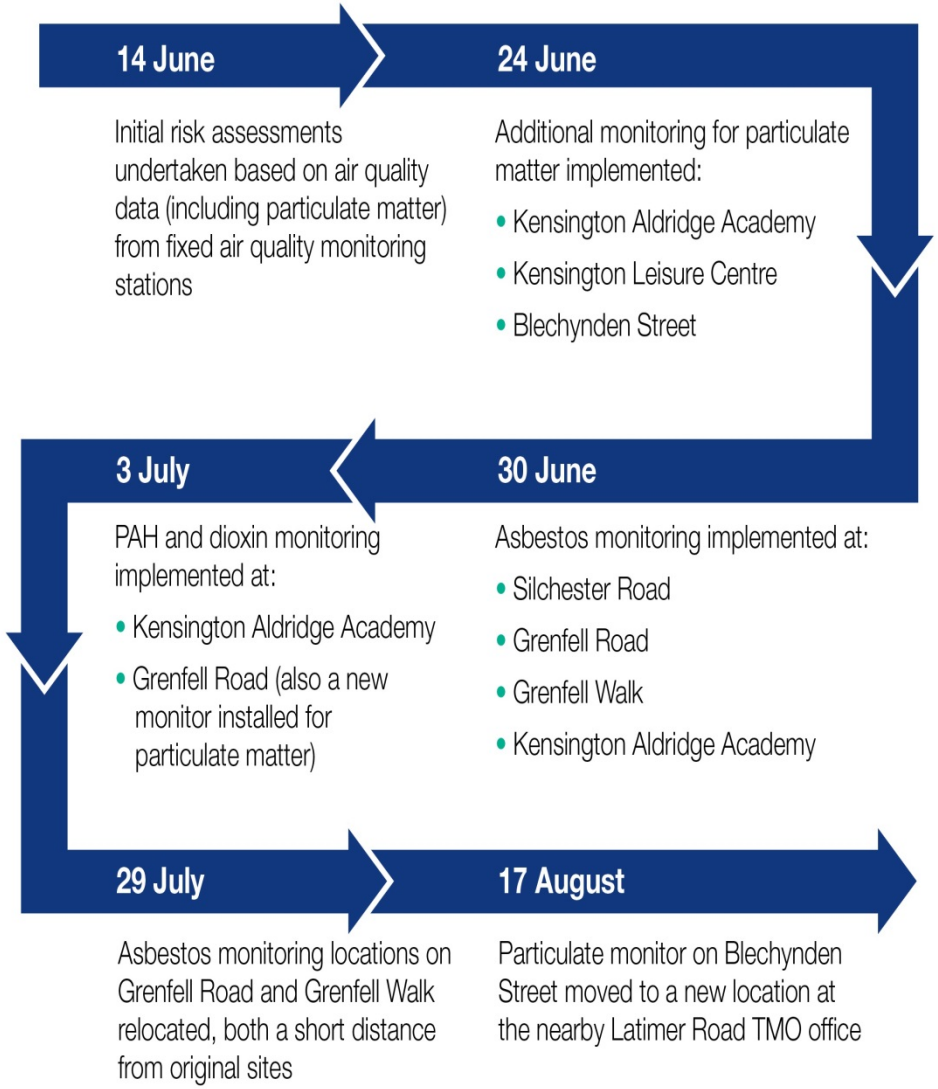
To supplement the initial risk assessments and plume modelling made on 14 June and the information available from the London Air Quality Monitoring Network (see Appendix 1) PHE introduced monitoring for particulate matter in close proximity to Grenfell Tower on 24 June at three locations (Kensington Aldridge Academy; Kensington Leisure Centre and Blechynden Street); a fourth monitoring site for particulate matter (Grenfell Road) was set up on 3 July.

Following a review of the monitoring locations, the particulate matter monitor at Blechynden Street was moved on 17 August, to a location close to the Latimer Road TMO office. The monitor was moved from Blechynden Street as it was located close to a motor garage and was occasionally impacted by vehicle exhaust emissions.

A new particulate monitor has also been co-located at Latimer Road TMO office, to allow a comparison between different particulate monitoring methods and reference standards used nationally.

Monitoring data for asbestos fibres taken from test equipment worn by staff working in Grenfell Tower was supplemented by PHE monitoring for asbestos in areas around Grenfell Tower from the 30 June. Two monitoring site locations for asbestos at Grenfell Road (B) and Grenfell Walk (C) were moved on 29 July due to accessibility issues but still within close proximity to the tower (see map above and Appendix 2 for further details).

PHE, after consulting with scientific partners, introduced monitoring for potential long-term low-concentration threats (dioxins and polycyclic aromatic hydrocarbons) on 3 July (Kensington Aldridge Academy and Grenfell Road). All the monitoring sites are highlighted on the map above. Further details of monitoring locations including photos can be found in Appendix 2.



Particulate matter (PM_{10}) data

Date	24 hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	15 minute Max	15 minute Max	15 minute Max	15 minute Max	15 minute Max	60 minute Max
	Academy PM_{10} µg/m^3	Leisure Centre PM_{10} µg/m^3	Blechynden St PM_{10} µg/m^3	Station Wk/ TMO office PM_{10} µg/m^3	Grenfell Rd PM_{10} µg/m^3	North Kensington PM_{10} µg/m^3	London Mean PM10 µg/m^3	Academy PM_{10} µg/m^3	Leisure Centre PM_{10} µg/m^3	Blechynden St PM_{10} µg/m^3	Station Wk/ TMO office PM_{10} µg/m^3	Grenfell Rd PM_{10} µg/m^3	North Kensington PM_{10} µg/m^3
Sat 24/06/17	4	5				14	14	15	53				17
Sun 25/06/17	4	5				12	12	10	11				17
Mon 26/06/17	7	8				14	17	12	14				19
Tue 27/06/17	13	14				32	26	21	22				38
Wed 28/06/17	5	5				16	15	10	9				27
Thur 29/06/17	4	5				14	15	8	7				18
Fri 30/06/17	4	5	12			15	16	16	9	101			22
Sat 01/07/17	7	8	12			19	17	14	15	64			21
Sun 02/07/17	6	7	10			16	14	9	14	44			23
Mon 03/07/17	6	8	13			16	15	13	13	103			20
Tue 04/07/17	6	7	17			17	17	10	11	121			25
Wed 05/07/17	7	8	19			20	19	10	10	163			25
Thur 06/07/17	10	11	23			15	27	25	23	86			26
Fri 07/07/17	6	7	18			10	19	9	10	111			14
Sat 08/07/17	4	5	11			7	14	13	14	48			20
Sun 09/07/17	5	6	17			12	17	12	13	104			22
Mon 10/07/17	7	7	14		43	10	17	18	18	87		773	13
Tue 11/07/17	7	6	23		13	8	14	18	13	446		299	16
Wed 12/07/17	6	6	16		9	8	14	46	12	180		15	15
Thur 13/07/17	8	9	23		15	12	19	11	14	224		200	15
Fri 14/07/17	6	7	10		11	9	16	9	13	37		103	11
Sat 15/07/17	7	8	13		11	9	17	12	13	66		59	15
Sun 16/07/17	4	4	9		7	5	10	6	20	36		42	8

	24 hr Mean	24 hr Mean	24hr Mean	24hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	15 minute Max	15 minute Max	15 minute Max	15 minute Max	15 minute Max	60 minute Max
Date	Academy PM_{10} µg/m^3	Leisure Centre PM_{10} µg/m^3	Blechynden St PM_{10} µg/m^3	Station Wk/ TMO office PM_{10} µg/m^3	Grenfell Rd PM_{10} µg/m^3	North Kensington PM_{10} µg/m^3	London Mean PM10 µg/m3	Academy PM_{10} µg/m^3	Leisure Centre PM_{10} µg/m^3	Blechynden St PM_{10} µg/m^3	Station Wk/ TMO office PM_{10} µg/m^3	Grenfell Rd PM_{10} µg/m^3	North Kensington PM_{10} µg/m^3
Mon 17/07/17	6	7	13		11	9	17	10	11	48		107	13
Tues18/07/17	12	13	29		22	17	26	20	24	204		101	32
Wed 19/07/17	11	12	19		37	18	24	26	31	46		943	34
Thur 20/07/17	7	8	14		12	9	16	11	13	74		28	27
Fri 21/07/17	8	8	30		15	10	17	12	13	694		67	13
Sat 22/07/17	5	5	11		11	5	12	9	10	50		210	10
Sun 23/07/17	6	6	9		9	9	13	11	13	26		26	20
Mon 24/07/17	4	4	11		11	7	12	7	6	346		269	6
Tues 25/07/17	5	6	11		8	6	17	8	9	62		13	13
Wed 26/07/17	7	7	12		14	1	17	17	18	28		163	3
Thur 27/07/17	15	15	21		26	No data	25	22	23	59		182	No data
Fri 28/07/17	12	12	19		19	No data	20	26	20	111		107	No data
Sat 29/07/17	7	8	14		12	No data	17	11	13	93		24	No data
Sun 30/07/17	5	5	9		10	No data	12	8	9	35		164	No data
Mon 31/07/17	10	10	28		16	19	20	12	13	525		55	143
Tue 01/08/17	9	10	19		17	9	20	14	16	160		64	18
Wed 02/08/17	5	5	9		11	7	14	8	9	31		118	12
Thur 03/08/17	13	13	18		20	No data	20	25	19	51		71	No data
Fri 04/08/17	8	9	14		12	No data	16	16	14	96		109	No data
Sat 05/08/17	5	6	8		6	No data	14	10	10	22		17	No data
Sun 06/08/17	7	7	12		9	No data	14	9	10	32		24	No data
Mon 07/08/17	8	9	16		10	No data	18	17	13	53		45	No data
Tue 08/08/17	3	4	5		4	No data	16	5	8	17		12	No data
Wed 09/08/17	6	6	9		8	No data	14	14	14	38		22	No data
Thur 10/08/17	9	10	21		11	14	21	14	18	643		34	16
Fri 11/08/17	9	10	14		10	18	21	14	15	111		36	31

	24 hr Mean	24 hr Mean	24hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	15 minute Max	15 minute Max	15 minute Max	15 minute Max	15 minute Max	60 minute Max
Date	Academy PM_{10} µg/m^3	Leisure Centre PM_{10} µg/m^3	Blechynden St PM_{10} µg/m^3	Station Wk/ TMO office PM_{10} µg/m^3	Grenfell Rd PM_{10} µg/m^3	North Kensington PM_{10} µg/m^3	London Mean PM10 µg/m^3	Academy PM_{10} µg/m^3	Leisure Centre PM_{10} µg/m^3	Blechynden St PM_{10} . µg/m^3	Station Wk/ TMO office PM_{10} µg/m^3	Grenfell Rd PM_{10} µg/m^3	North Kensington PM_{10} µg/m^3
Sat 12/08/17	5	4	20		5	10	11	9	7	684		16	13
Sun 13/08/17	7	8	14		7	14	15	19	13	55		14	20
Mon 14/08/17	7	8	24		11	16	21	24	13	173		130	23
Tues 15/08/17	7	8	18		8	17	21	15	14	471		34	28
Wed 16/08/17	7	8	19		10	15	20	13	13	135		157	22
Thur 17/08/17	6	7			9	13	17	15	17	22	19	93	18
Fri 18/08/17	8	10		12	11	15	16	18	21		24	40	16
Sat 19/08/17	8	10		12	10	12	14	10	12		15	16	13
Sun 20/08/17	8	9		13	10	14	14	11	14		40	57	15
Mon 21/08/17	4	5		5	6	8	14	7	8		10	119	14
Tues 22/08/17	8	9		10	10	7	24	16	15		16	149	13
Wed 23/08/17	11	12		13	11	5	31	20	21		25	53	9
Thu 24/08/17	7	9		9	9	5	18	11	13		15	45	7
Fri 25/08/17	9	11		12	11	12	23	18	21		22	21	28
Sat 26/08/17	10	11		12	10	24	24	18	21		22	21	36
Sun 27/08/17	8	9		9	9	23	21	22	17		18	44	44
Mon 28/08/17	10	12		12	11	37	35	18	19		27	41	58
Tue 29/08/17	9	10		11	11	25	28	16	19		21	131	35
Wed 30/08/17	9	12		12	15	16	20	14	18		32	100	21
Thur 31/08/17	7	8		9	9	18	20	14	15		17	46	22
Fri 01/09/17	7	8		9	8	17	19	13	13		15	19	22
Sat 02/09/17	6	7		8	6	18	18	8	10		19	10	22
Sun 03/09/17	5	6		7	7	16	15	8	10		24	92	27
Mon 04/09/17	3	4		4	10	13	14	5	6		22	401	18
Tues 05/09/17	4	4		5	6	11	13	7	8		6	75	16
Wed 06/09/17	17	21		21	19	18	28	29	33		35	36	30

	24 hr Mean	24 hr Mean	24hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	15 minute Max	15 minute Max	15 minute Max	15 minute Max	15 minute Max	60 minute Max
Date	Academy PM_{10} µg/m^3	Leisure Centre PM_{10} µg/m^3	Blechynden St PM_{10} µg/m^3	Station Wk/ TMO office PM_{10} µg/m^3	Grenfell Rd PM_{10} µg/m^3	North Kensington PM_{10} µg/m^3	London Mean PM10 µg/m^3	Academy PM_{10} µg/m^3	Leisure Centre PM_{10} µg/m^3	Blechynden St PM_{10} . µg/m^3	Station Wk/ TMO office PM_{10} µg/m^3	Grenfell Rd PM_{10} µg/m^3	North Kensington PM_{10} µg/m^3
Thur 07/09/17	17	21		23	20	18	28	29	34		42	37	28
Fri 08/09/17	4	5		5	6	5	12	8	9		11	14	14
Sat 09/09/17	5	6		7	16	8	13	8	11		10	635	13
Sun 10/09/17	6	7		7	7	7	12	13	13		20	19	13
Mon 11/09/17	10	12		13	15	8	15	18	21		22	143	10
Tues 12/09/17	7	9		10	9	7	14	12	16		17	22	11
Wed 13/09/17	7	8		8	9	7	15	15	16		17	65	14
Thur 14/09/17	5	6		6	6	6	12	9	11		11	28	10
Fri 15/09/17	6	7		8	7	8	15	12	13		14	18	15
Sat 16/09/17	5	6		6	6	10	15	10	12		27	12	21
Sun 17/09/17	5	6		6	6	8	12	11	13		14	13	16
Mon 18/09/17	8	9		10	9	11	17	13	16		17	18	12
Tue 19/09/17	6	7		8	7	12	21	10	11		12	26	18
Wed 20/09/17	8	8		10	11	No data	24	10	12		16	94	No data
Thu 21/09/17	7	8		10	10	11	19	10	12		17	50	14
Fri 22/09/17	8	9		10	10	11	18	16	19		19	89	23
Sat 23/09/17	6	7		9	8	10	16	12	14		30	53	25
Sun 24/09/17	8	9		11	8	32	24	16	17		31	26	32
Mon 25/09/17	13	14		16	13	36	39	21	21		25	91	47
Tue 26/09/17	16	16		18	16	33	43	30	28		29	209	37
Wed 27/09/17	22	21		23	16	45	54	46	47		50	43	66
Thu 28/09/17	6	7		8	8	10	18	11	13		8	23	38
Fri 29/09/17	13	15		No data	13	13	22	22	27		No data	24	22
Sat 30/09/17	12	15		No data	13	12	19	20	25		No data	35	20
Sun 01/10/17	3	4		No data	5	4	8	8	9		No data	46	9
Mon 02/10/17	20	24		No data	22	13	25	36	41		No data	36	18

	24 hr Mean	24 hr Mean	24hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	15 minute Max	15 minute Max	15 minute Max	15 minute Max	15 minute Max	60 minute Max
Date	Academy PM_{10} µg/m^3	Leisure Centre PM_{10} µg/m^3	Blechynden St PM_{10} µg/m^3	Station Wk/ TMO office PM_{10} µg/m^3	Grenfell Rd PM_{10} µg/m^3	North Kensington PM_{10} µg/m^3	London Mean PM10 µg/m^3	Academy PM_{10} µg/m^3	Leisure Centre PM_{10} µg/m^3	Blechynden St PM_{10} . µg/m^3	Station Wk/ TMO office PM_{10} µg/m^3	Grenfell Rd PM_{10} µg/m^3	North Kensington PM_{10} µg/m^3
Tue 03/10/17	12	15		17	13	13	22	20	23		25	19	25
Wed 04/10/17	11	15		16	13	13	23	16	25		25	23	14
Thu 05/10/17	8	9		11	9	8	15	14	16		16	16	12
Fri 06/10/17	9	11		12	9	9	18	18	20		25	15	11
Sat 07/10/17	6	7		9	6	10	12	12	14		22	12	12
Sun 08/10/17	6	6		7	6	6	14	22	20		27	19	10
Mon 09/10/17	9	9		11	9	13	20	21	17		31	71	27
Tue 10/10/17	6	6		8	6	8	14	10	11		13	14	13
Wed 11/10/17	7	8		11	9	8	16	13	20		21	36	14
Thu 12/10/17	17	21		22	17	15	26	23	29		36	23	22
Fri 13/10/17	11	12		13	10	13	18	24	29		28	22	21
Sat 14/10/17	11	13		14	11	15	22	19	18		19	32	24
Sun 15/10/17	13	16		17	13	25	34	19	23		24	40	39
Mon 16/10/17	22	26		30	22	39	39	30	39		50	67	39
Tue 17/10/17	22	25		35	21	20	35	30	30		511	72	30
Wed 18/10/17	34	41		45	31	26	49	95	109		126	74	39
Thu 19/10/17	13	15		20	14	23	34	30	33		57	92	45
Fri 20/10/17	10	12		14	12	10	18	17	22		22	32	19
Sat 21/10/17	15	18		21	18	13	19	28	31		37	41	22
Sun 22/10/17	7	9		10	8	7	11	12	15		17	18	13
Mon 23/10/17	8	9		13	10	9	17	12	13		46	156	15
Tue 24/10/17	6	7		16	7	8	14	11	14		98	24	15
Wed 25/10/17	10	12		15	11	9	24	18	22		31	32	13
Thu 26/10/17	10	11		13	9	17	25	30	26		28	21	27
Fri 27/10/17	11	13		14	11	16	22	18	22		23	17	34

	24 hr Mean	24 hr Mean	24hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	24 hr Mean	15 minute Max	15 minute Max	15 minute Max	15 minute Max	15 minute Max	60 minute Max
Date	Academy PM10 µg/m3	Leisure Centre PM10 µg/m3	Blechynden St PM10 µg/m3	Station Wk/ TMO office PM10 µg/m3	Grenfell Rd PM10 µg/m3	North Kensington PM10 µg/m3	London Mean PM10 µg/m^3	Academy PM_{10} µg/m^3	Leisure Centre PM_{10} µg/m^3	Blechynden St PM_{10} . µg/m^3	Station Wk/ TMO office PM_{10} µg/m^3	Grenfell Rd PM_{10} µg/m^3	North Kensington PM_{10} µg/m^3
Sat 28/10/17	8	9		10	8	14	17	13	17		18	17	26
Sun 29/10/17	8	11		11	10	10	14	17	22		23	19	16
Mon 30/10/17	15	18		19	15	12	26	26	29		33	29	18
Tue 31/10/17	17	20		22	16	20	29	45	85		53	69	32
Wed 01/11/17	15	18		20	14	21	33	24	28		43	23	39
Thu 02/11/17	20	23		26	18	37	45	31	33		66	27	54
Fri 03/11/17	20	22		23	18	47	47	54	55		45	34	179
Sat 04/11/17	9	11		11	8	24	27	23	25		25	18	51
Sun 05/11/17	8	9		10	9	21	24	18	22		24	40	54
Mon 06/11/17	12	13		16	13	29	32	20	22		92	77	50
Tue 07/11/17	8	9		10	9	12	16	13	15		18	38	18
Wed 08/11/17	8	11		12	10	13	21	15	18		23	16	26
Thu 09/11/17	13	15		16	13	19	30	19	22		24	22	25
Fri 10/11/17	12	13		16	12	13	20	16	18		27	18	21
Sat 11/11/17	7	7		9	7	13	17	18	17		26	16	30
Sun 12/11/17	4	5		6	5	10	11	11	11		12	9	28
Mon 13/11/17	8	9		11	9	10	18	14	16		18	16	21
Tues 14/11/17	12	13		15	12	15	22	20	20		24	32	20
Wed 15/11/17	8	9		10	8	18	31	13	13		17	14	29
Thu 16/11/17	10	11		13	11	6	26	15	16		19	109	29
Fri 17/11/17	19	21		23	19	17	33	47	52		55	57	23
Sat 18/11/17	11	11		13	10	20	19	19	19		25	19	24
Sun 19/11/17	10	11		13	10	14	20	16	19		20	15	16
Mon 20/11/17	8	8		10	9	13	16	10	10		14	96	16
Tue 21/11/17	14	14		19	14	15	22	25	19		51	25	20

The table above shows the twenty four hour average (and maximum fifteen minute) levels of particulate matter (PM_{10}) measured each day at the four monitoring sites close to Grenfell Tower. The table also presents levels measured at the North Kensington London Air Quality Network site (which reports readings as hourly rather than fifteen minute averages) and the London Mean (produced by Kings College London based on monitoing data across the London Air Quality Network). We understand (from liaison with Kings College London) that between 6 July and 8 August, mechanical issues at the the North Kensington monitoring station have resulted in the PM_{10} concentrations being under-reported. However, we are advised by Kings College London that the London Mean PM_{10} data is typically very similar to the North Kensington levels so it would be suitable to use the mean level as an alternative.

PHE note that the data contains some isolated short-lived “peaks” in particulate matter which occur over the fifteen minute averaging periods. For example an elevated reading of 943 µg/m^3 was recorded at Grenfell Road on 19 July, this coincided with drilling along Grenfell Road associated with the investigation of a potential gas leak and the release of particulate matter. These peaks are not uncommon, particularly in urban environments, and there are numerous potential sources that could contribute, including the start-up of engines for cars and generators, burning of fossil fuels and other minor combustion sources (eg cigarettes). For instance, the Blechynden Road site, which was in close proximity to a car garage (see photo in Appendix 2), had more peaks than the other monitoring stations while we were monitoring at that location. The evidence for particulate matter causing adverse health impacts is generally focused on average exposure during a twenty four hour period or longer. Hence, given that these peaks are short-lived and have not significantly influenced the twenty four hour average it is unlikely that they would represent an increased risk to public health.

The mean or average results for each day (twenty four hour average) have been compared against the UK’s daily air quality index (DAQI), and all the results are within the low air pollution band (1-3).

The DAQI is a measure of the levels of air pollution. The index is numbered from 1 to 10 and is divided into four bands, low (1) to very high (10), to provide detail about air pollution levels in a clear way.

Index Bands

1 2 3	4 5 6	7 8 9	10
Low	Moderate	High	Very High

PM_{10} Particles

Based on the daily mean concentration for historical data, latest 24 hour running mean for the current day.

Index	1	2	3	4	5	6	7	8	9	10
Band	Low	Low	Low	Moderate	Moderate	Moderate	High	High	High	Very High
µg/m³	0-16	17-33	34-50	51-58	59-66	67-75	76-83	84-91	92-100	101 or more

Figures 1-22 below, covering the first twentytwo weeks of particulate matter monitoring, show that the 24 hour average levels of particulate matter (PM_{10}) have all been below the UK national air quality objective for PM_{10} of 50 µg/m^3 which aims to protect health and the environment.

Figure 1

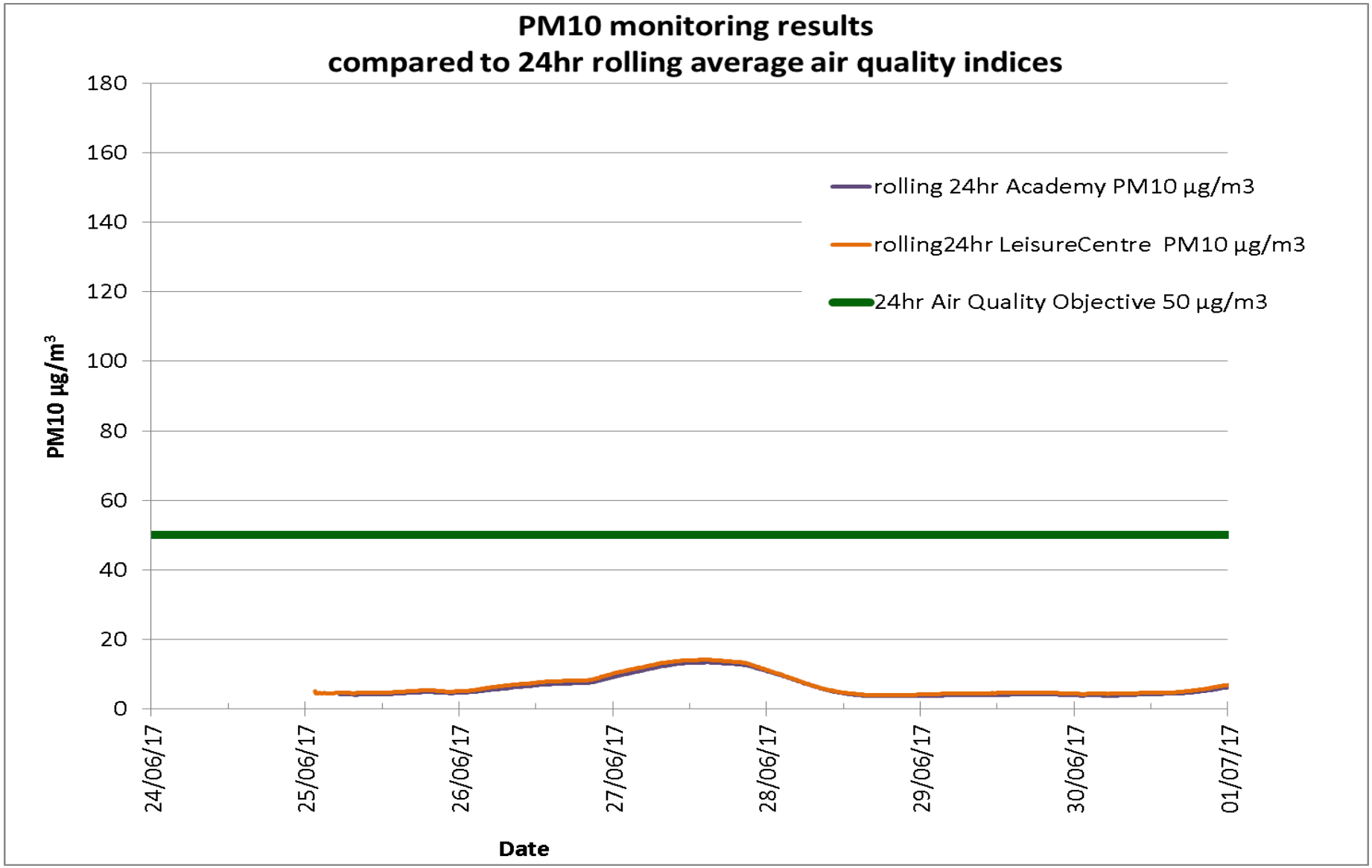
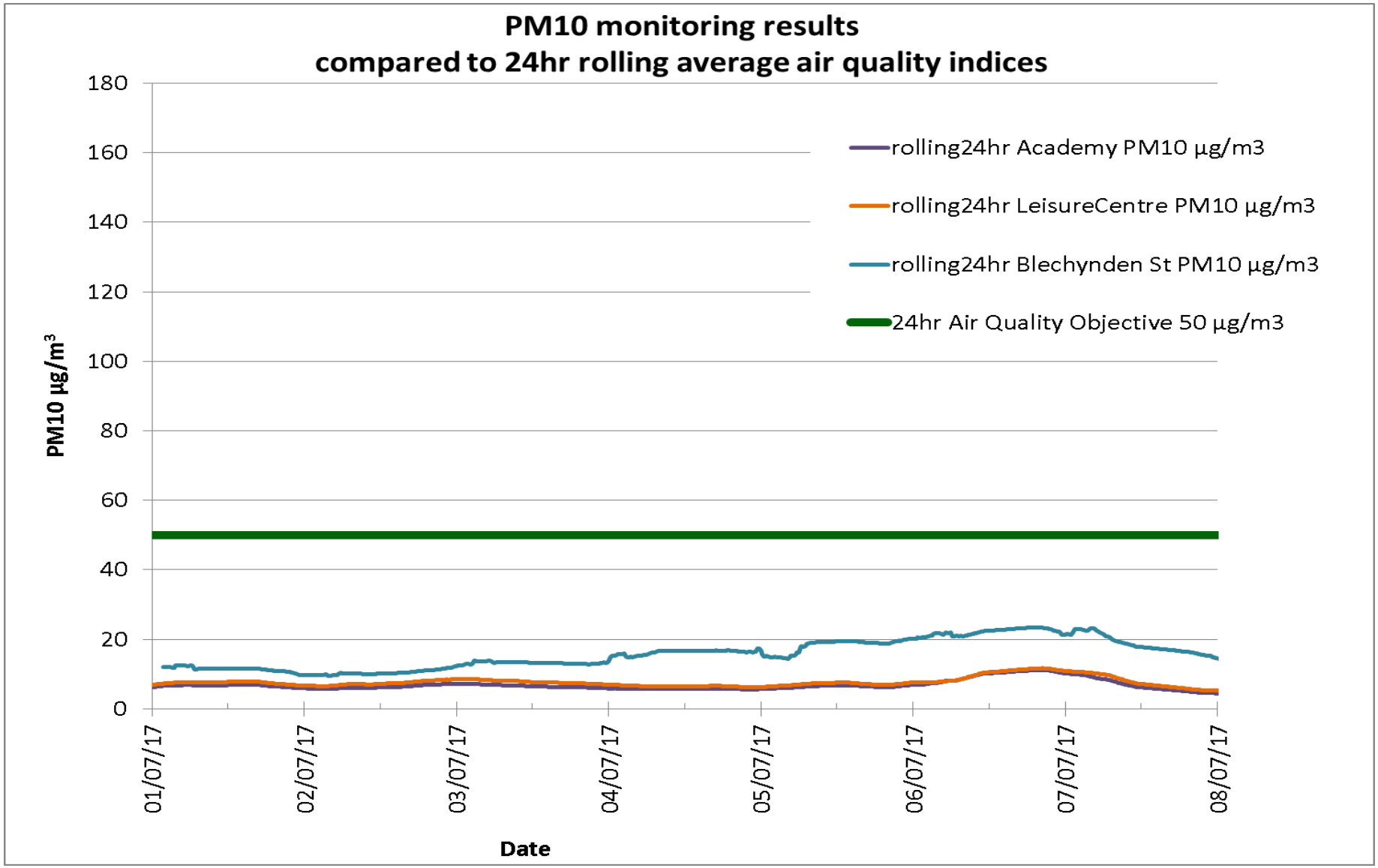

PM10 monitoring results
compared to 24hr rolling average air quality indices
180
160
140
120
100
80
60
40
20
0
PM10 µg/m3
rolling 24hr Academy PM10 µg/m3
rolling24hr LeisureCentre PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
24/06/17
25/06/17
26/06/17
27/06/17
28/06/17
29/06/17
30/06/17
01/07/17
Date

Figure 2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80
60
40
20
0
PM10 µg/m3
rolling24hr Academy PM10 µg/m3
rolling24hr LeisureCentre PM10 µg/m3
rolling24hr Blechynden St PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
01/07/17
02/07/17
03/07/17
04/07/17
05/07/17
06/07/17
07/07/17
08/07/17
Date

Figure 3

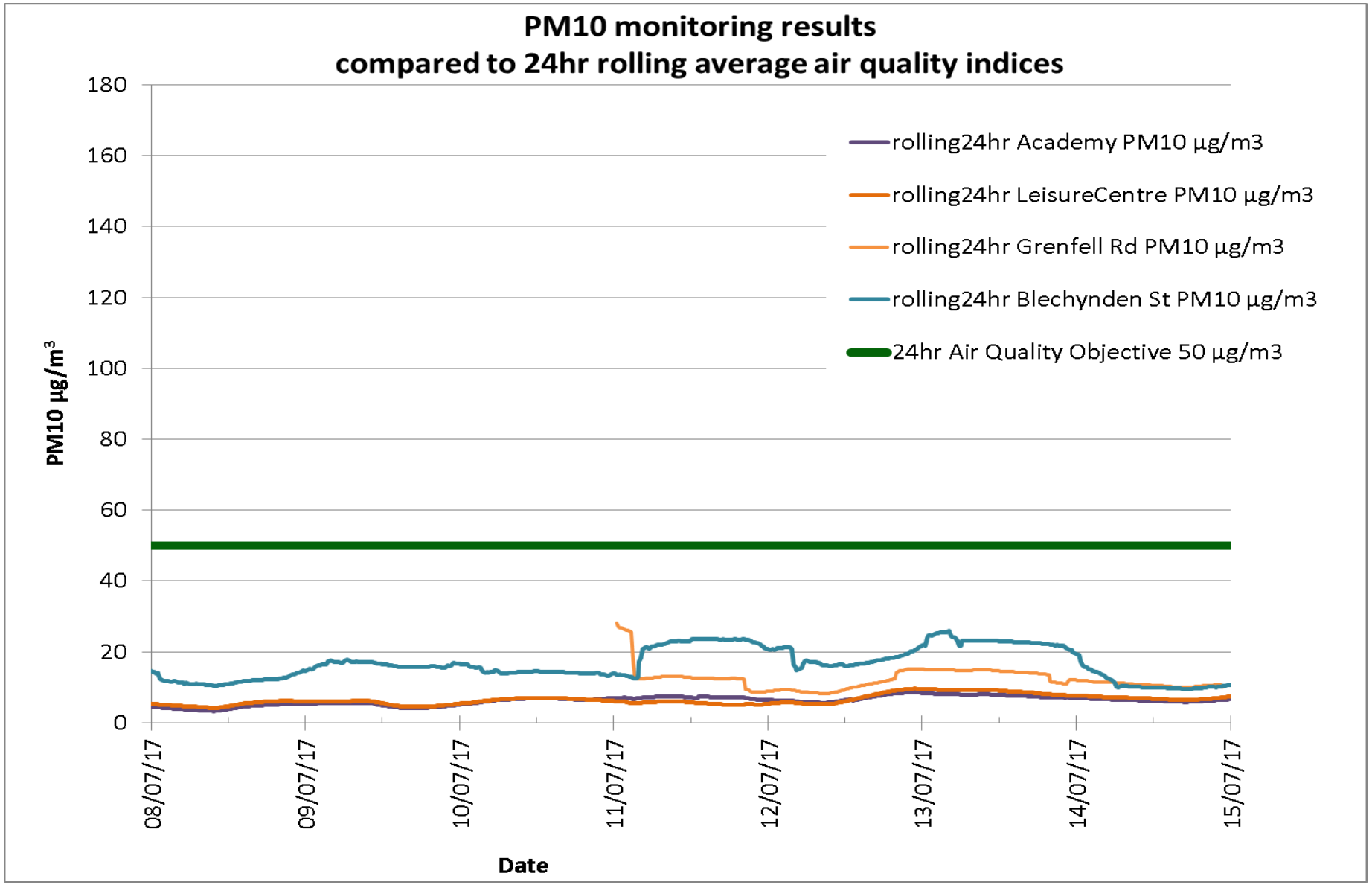
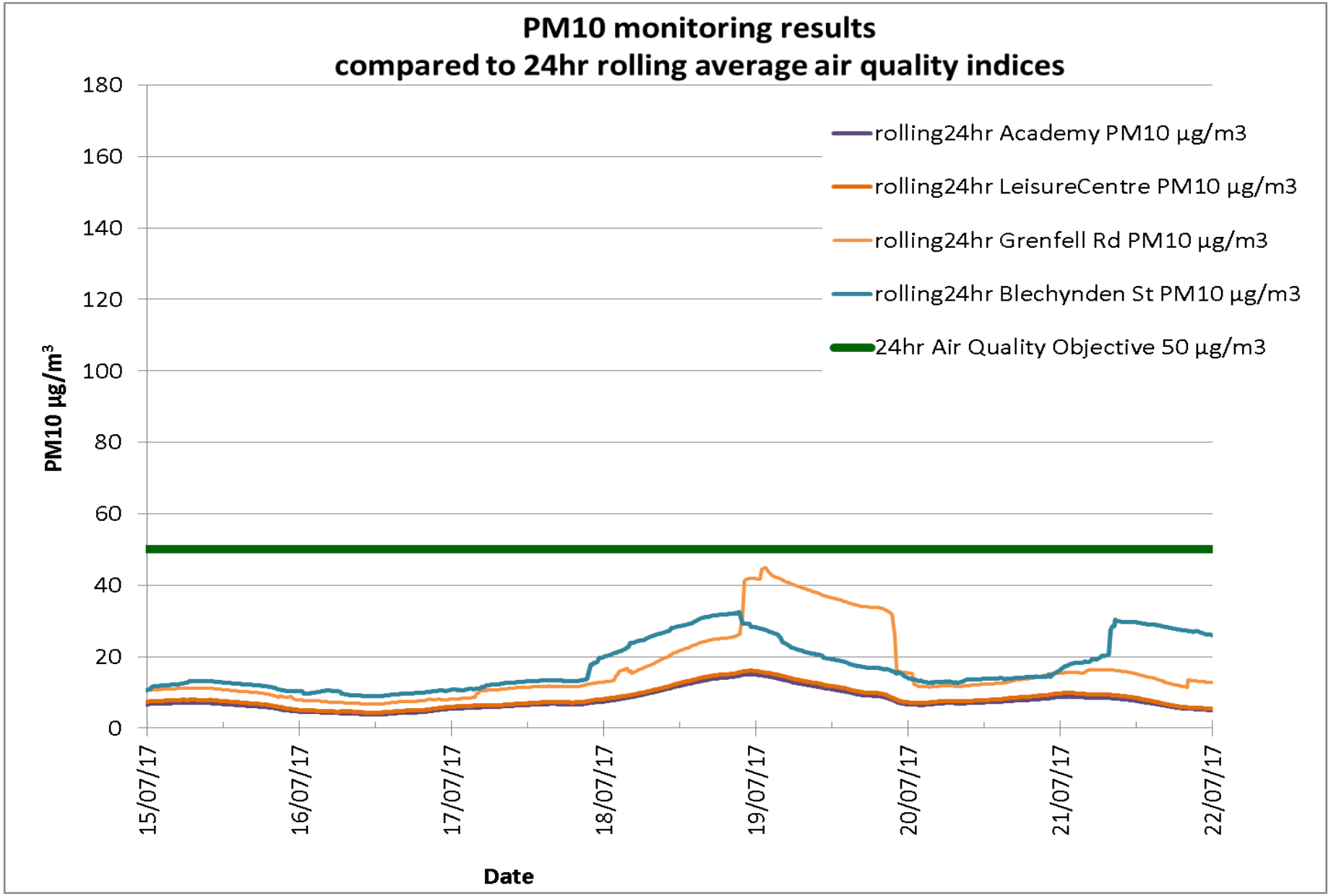

PM10 monitoring results
compared to 24hr rolling average air quality indices
PM10 µg/m³
180
160
140
120
100
80
60
40
20
0
08/07/17
09/07/17
10/07/17
11/07/17
12/07/17
13/07/17
14/07/17
15/07/17
Date
rolling24hr Academy PM10 µg/m3
rolling24hr LeisureCentre PM10 µg/m3
rolling24hr Grenfell Rd PM10 µg/m3
rolling24hr Blechynden St PM10 µg/m3
24hr Air Quality Objective 50 µg/m3

Figure 4


PM10 monitoring results
compared to 24hr rolling average air quality indices
PM10 µg/m3
180
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100
80
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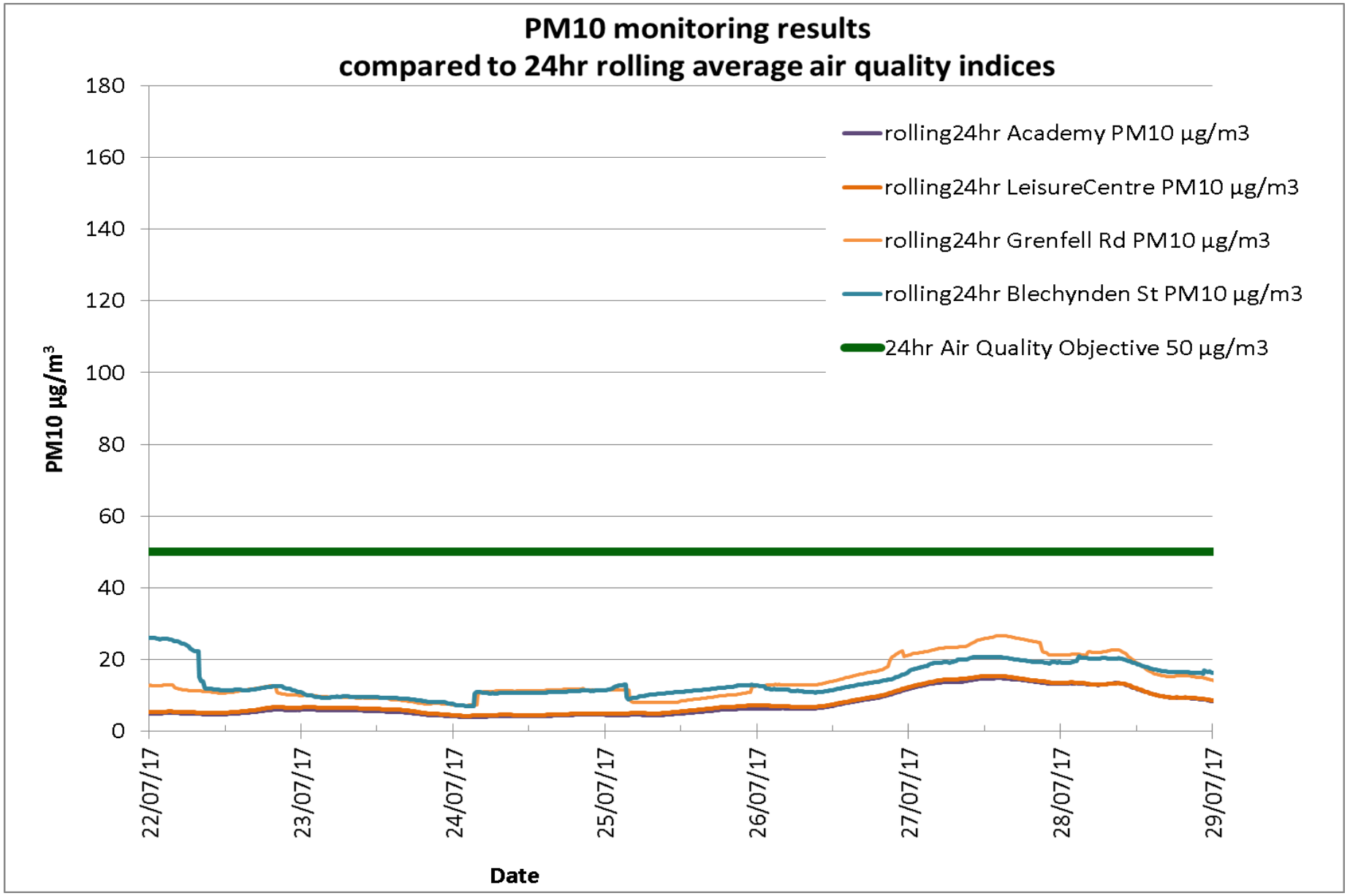
20
0
rolling24hr Academy PM10 µg/m3
rolling24hr LeisureCentre PM10 µg/m3
rolling24hr Grenfell Rd PM10 µg/m3
rolling24hr Blechynden St PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
15/07/17
16/07/17
17/07/17
18/07/17
19/07/17
20/07/17
21/07/17
22/07/17
Date

Figure 5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PM10 µg/m³
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0
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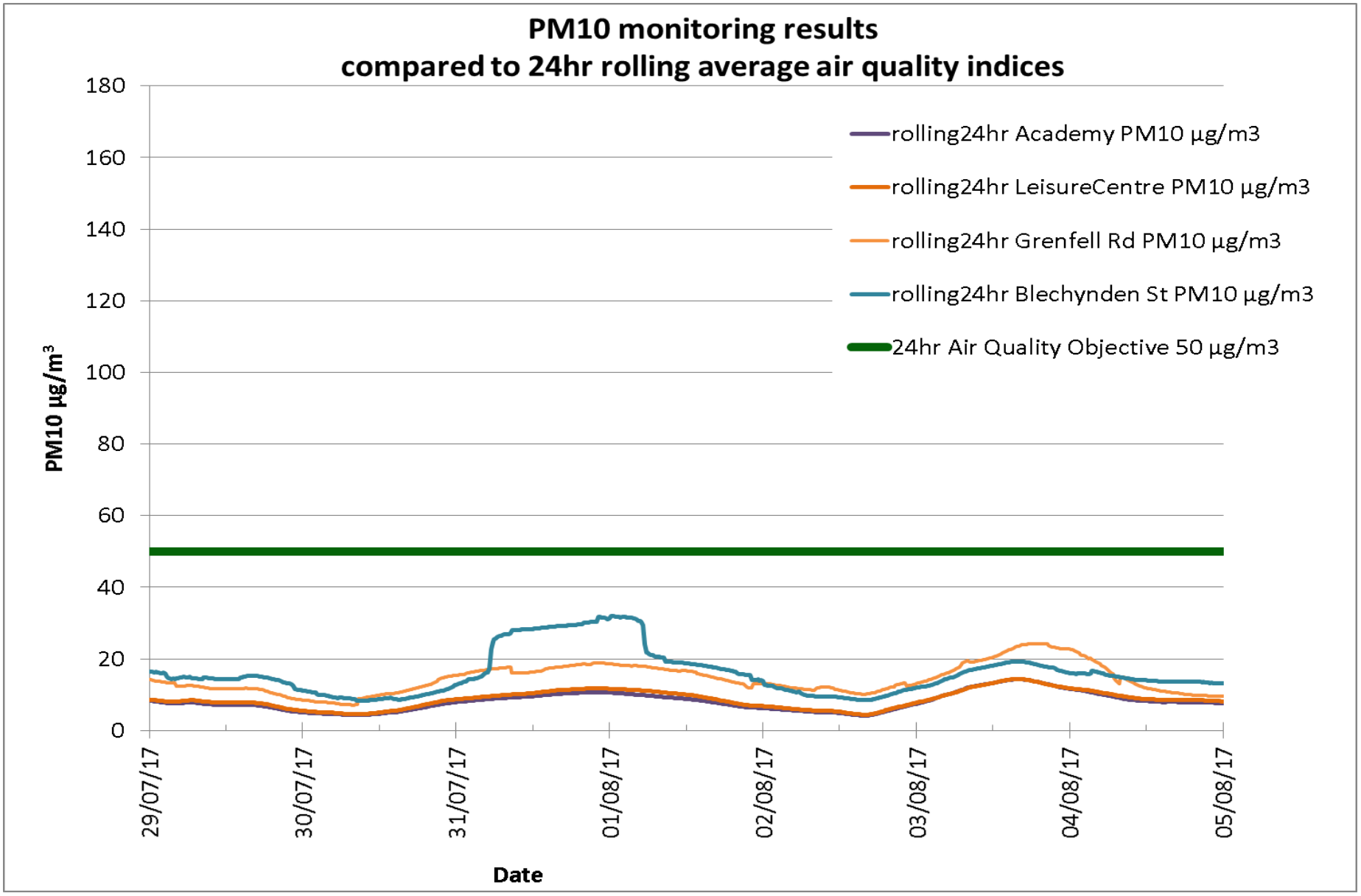
rolling24hr Grenfell Rd PM10 µg/m3
rolling24hr Blechynden St PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
22/07/17
23/07/17
24/07/17
25/07/17
26/07/17
27/07/17
28/07/17
29/07/17
Date

Figure 6


PM10 monitoring results
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PM10 µg/m³
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140
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rolling24hr Grenfell Rd PM10 µg/m3
rolling24hr Blechynden St PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
29/07/17
30/07/17
31/07/17
01/08/17
02/08/17
03/08/17
04/08/17
05/08/17
Date

Figure 7

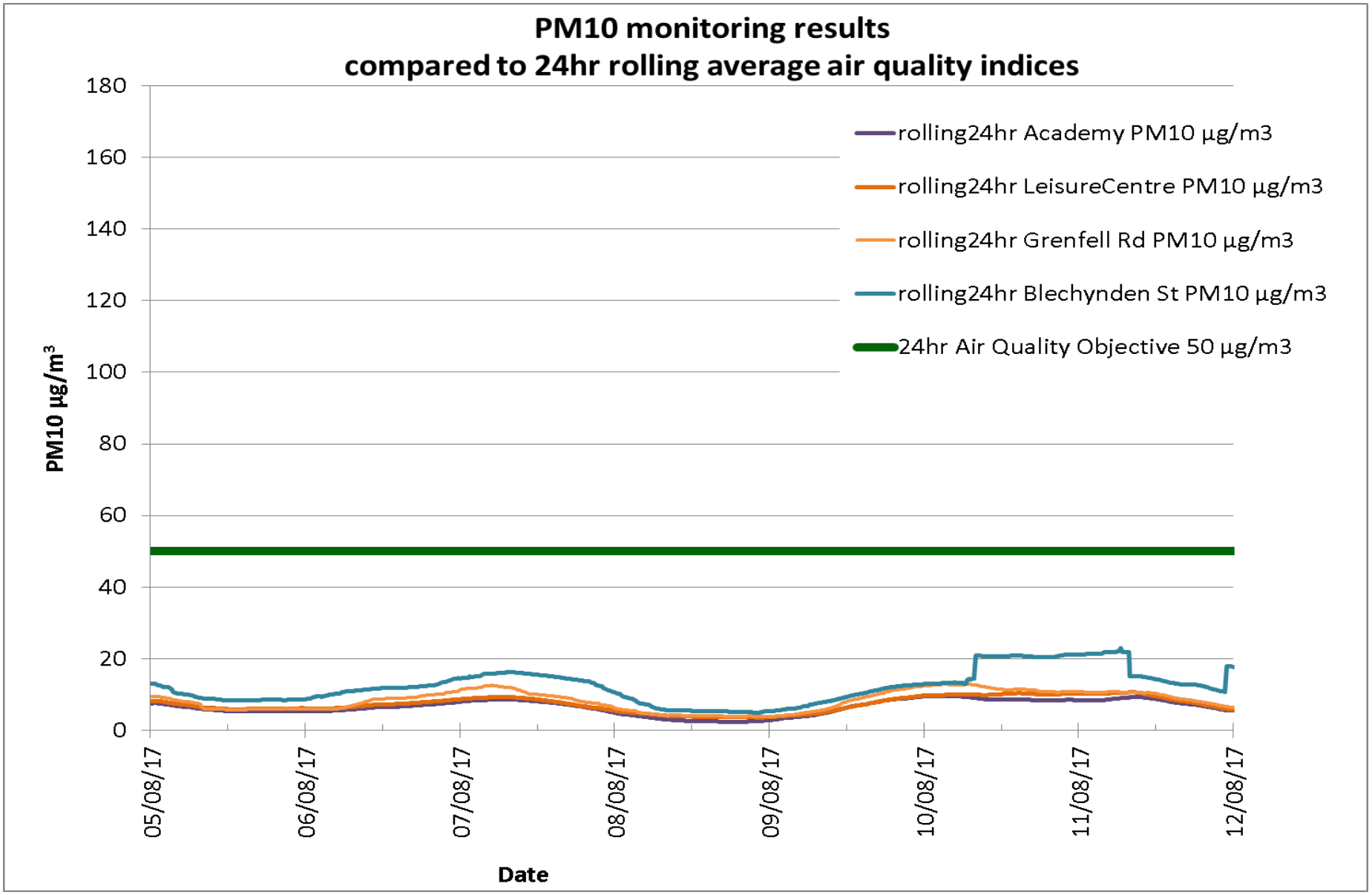

PM10 monitoring results
compared to 24hr rolling average air quality indices
PM10 µg/m3
180
160
140
120
100
80
60
40
20
0
05/08/17
06/08/17
07/08/17
08/08/17
09/08/17
10/08/17
11/08/17
12/08/17
Date
rolling24hr Academy PM10 µg/m3
rolling24hr LeisureCentre PM10 µg/m3
rolling24hr Grenfell Rd PM10 µg/m3
rolling24hr Blechynden St PM10 µg/m3
24hr Air Quality Objective 50 µg/m3

Figure 8

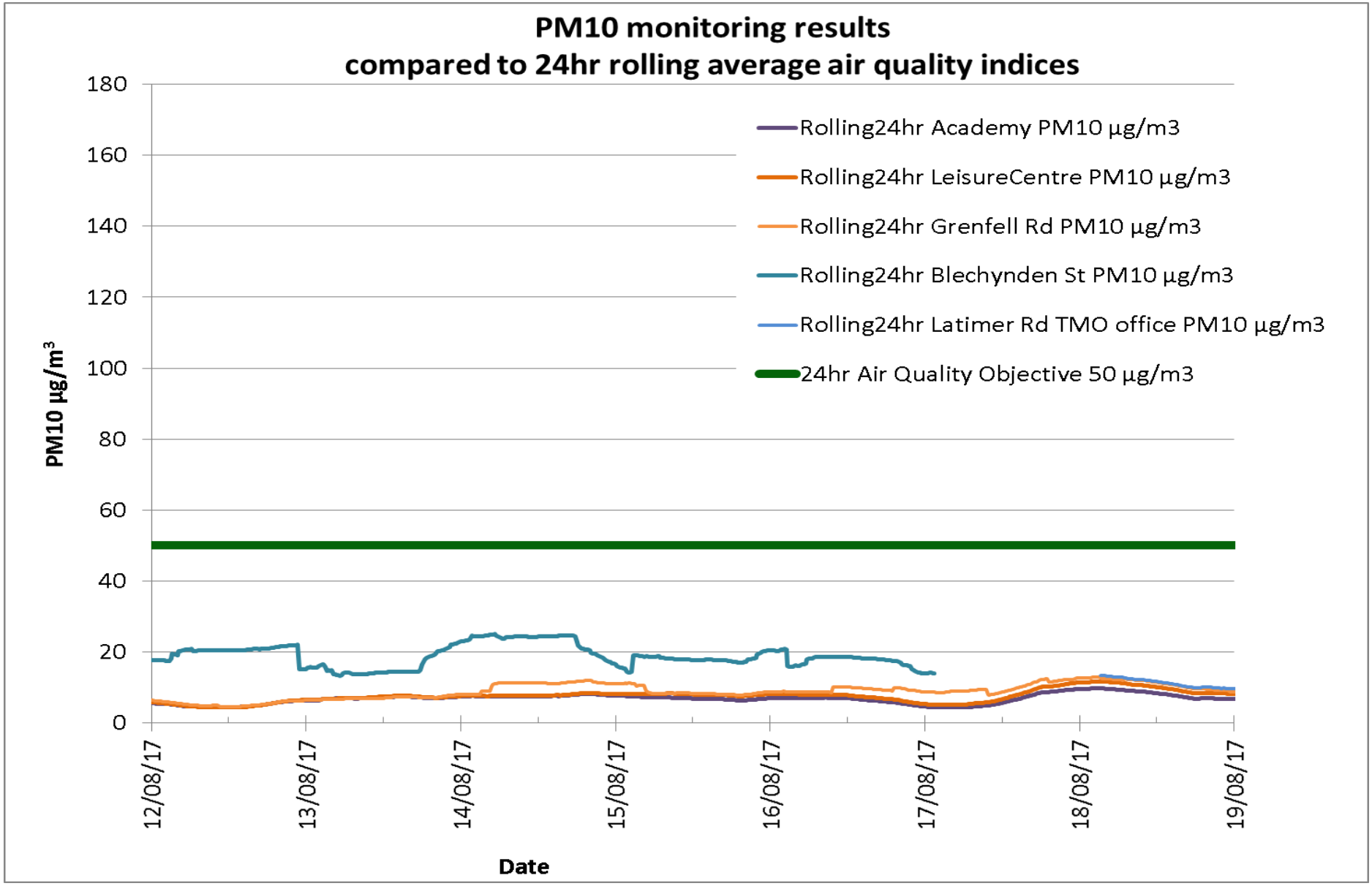

PM10 monitoring results
compared to 24hr rolling average air quality indices
PM10 µg/m3
180
160
140
120
100
80
60
40
20
0
12/08/17
13/08/17
14/08/17
15/08/17
16/08/17
17/08/17
18/08/17
19/08/17
Date
Rolling24hr Academy PM10 µg/m3
Rolling24hr LeisureCentre PM10 µg/m3
Rolling24hr Grenfell Rd PM10 µg/m3
Rolling24hr Blechynden St PM10 µg/m3
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3

Figure 9

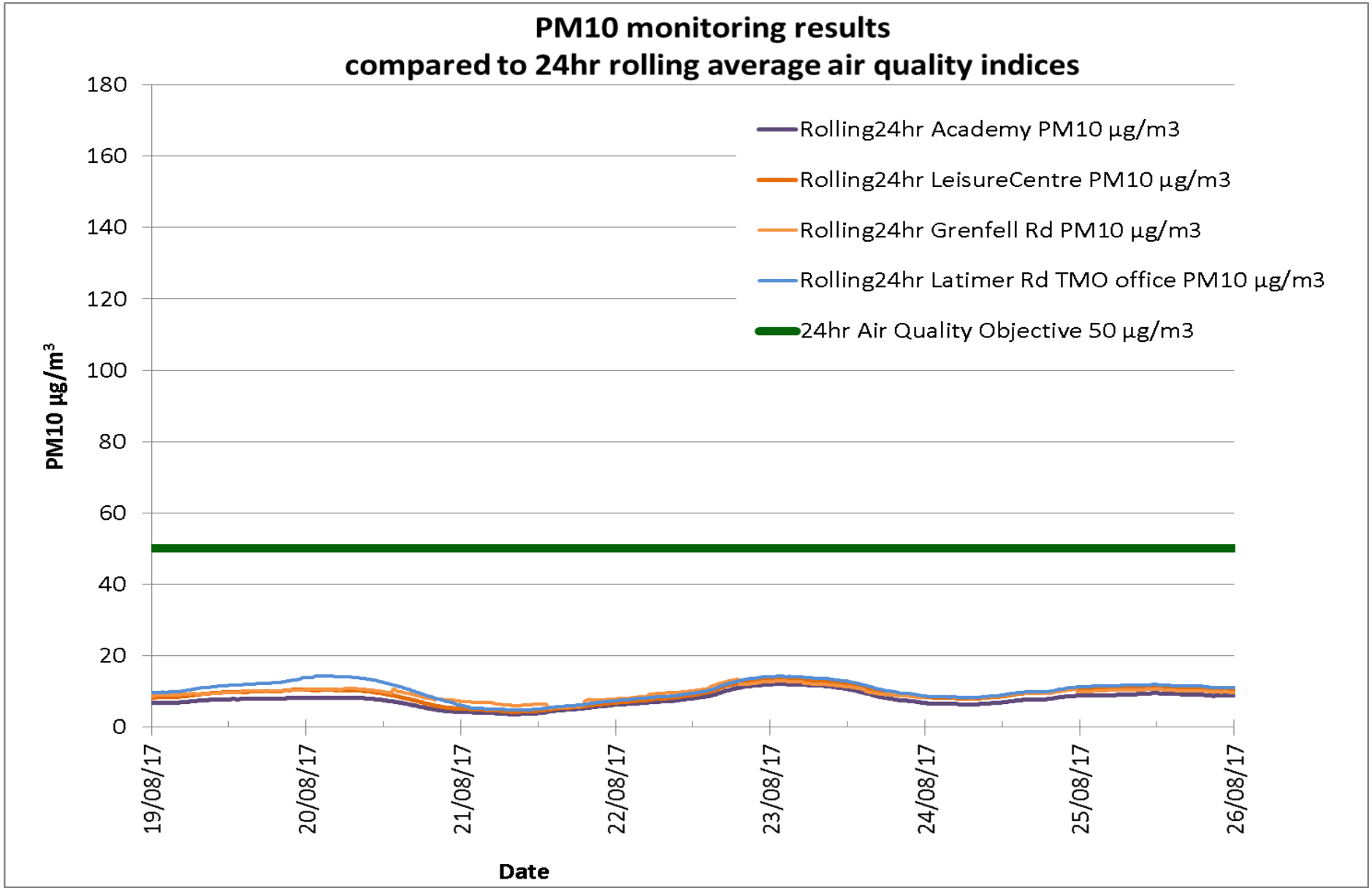
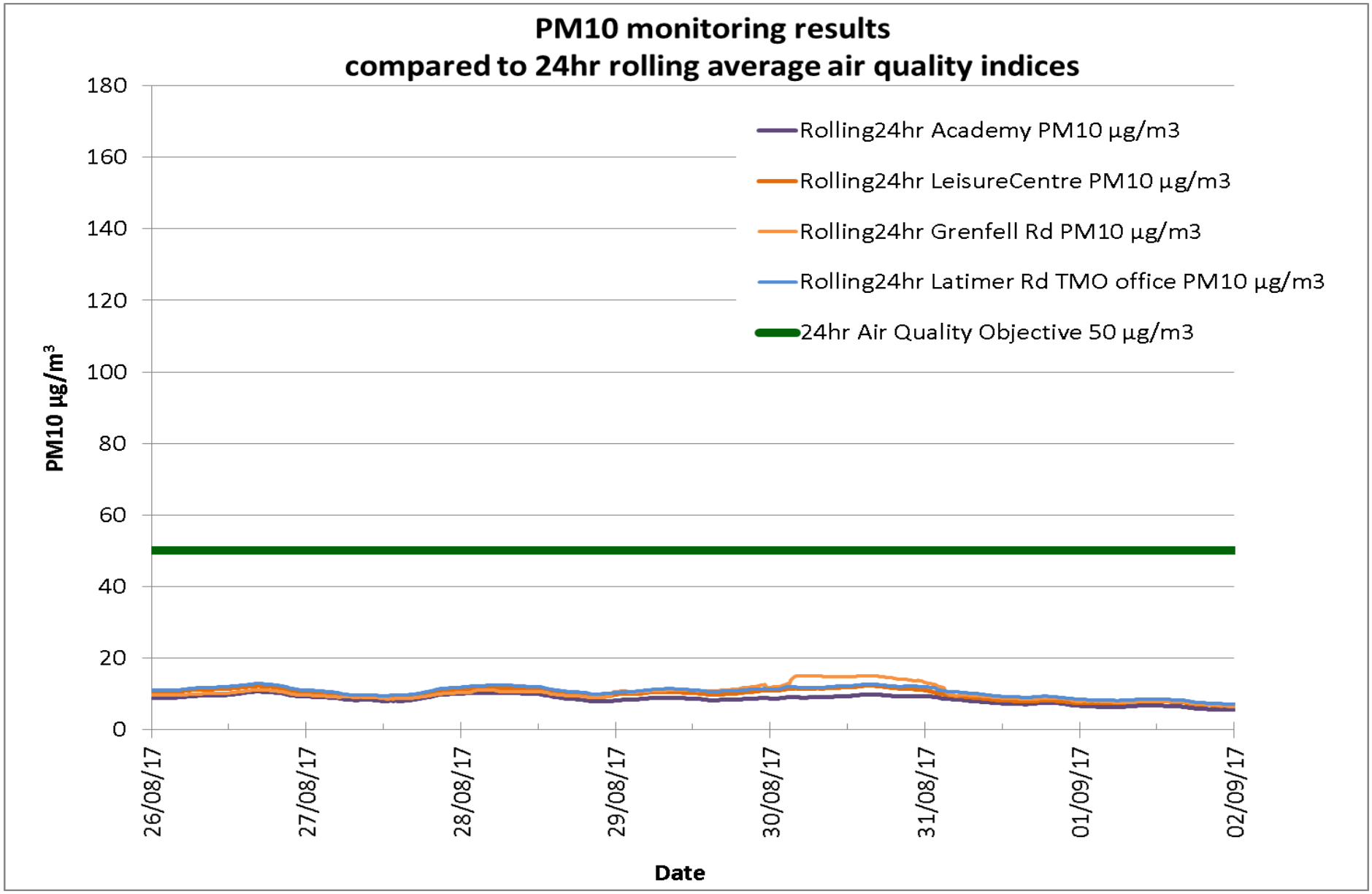

PM10 monitoring results
compared to 24hr rolling average air quality indices
180
160
140
120
100
80
60
40
20
0
PM10 µg/m³
Rolling24hr Academy PM10 µg/m3
Rolling24hr LeisureCentre PM10 µg/m3
Rolling24hr Grenfell Rd PM10 µg/m3
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
19/08/17
20/08/17
21/08/17
22/08/17
23/08/17
24/08/17
25/08/17
26/08/17
Date

Figure 10


PM10 monitoring results
compared to 24hr rolling average air quality indices
180
160
140
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100
80
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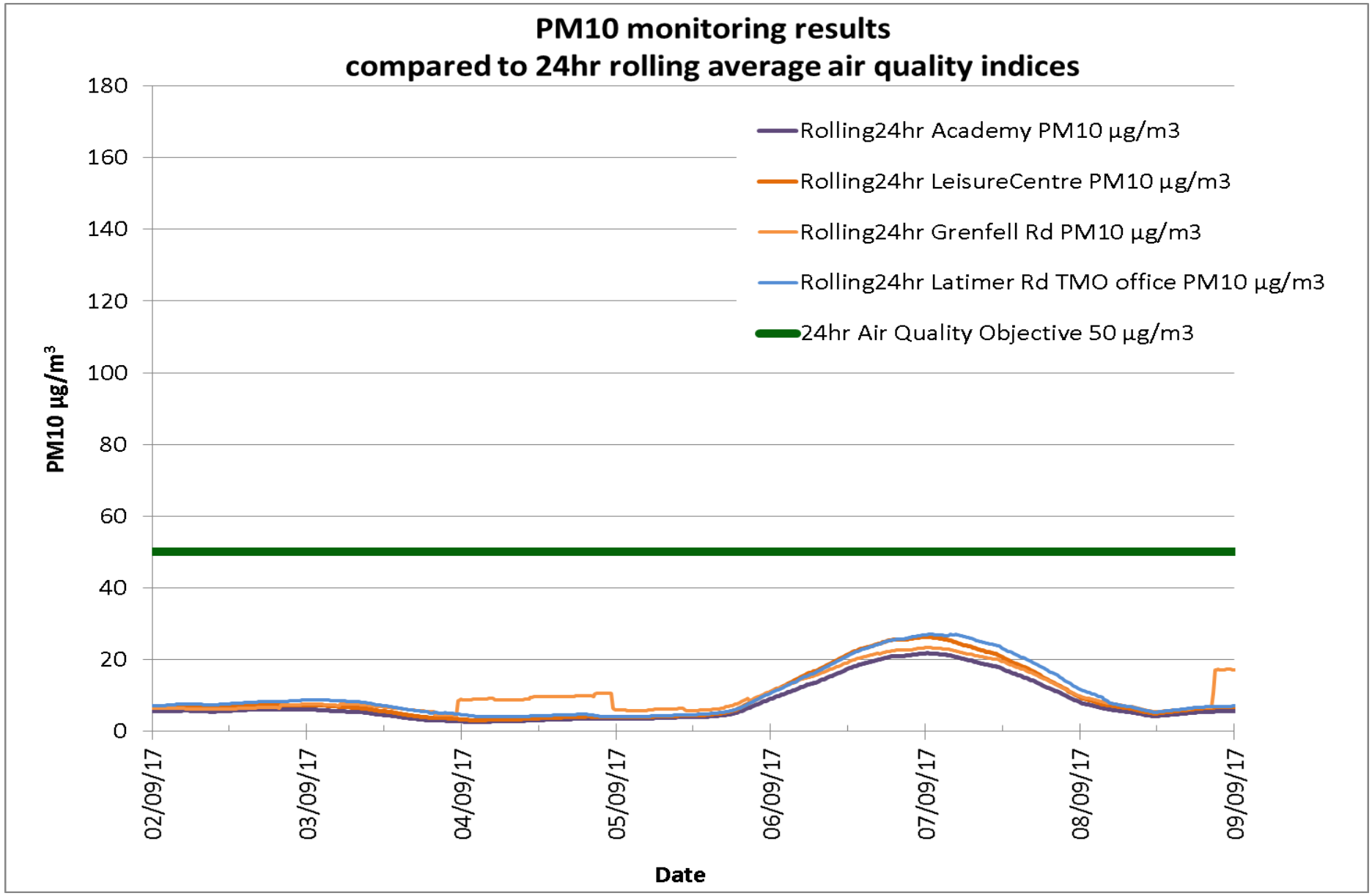
20
0
PM10 µg/m³
Rolling24hr Academy PM10 µg/m3
Rolling24hr LeisureCentre PM10 µg/m3
Rolling24hr Grenfell Rd PM10 µg/m3
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
26/08/17
27/08/17
28/08/17
29/08/17
30/08/17
31/08/17
01/09/17
02/09/17
Date

Figure 11


PM10 monitoring results
compared to 24hr rolling average air quality indices
180
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80
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20
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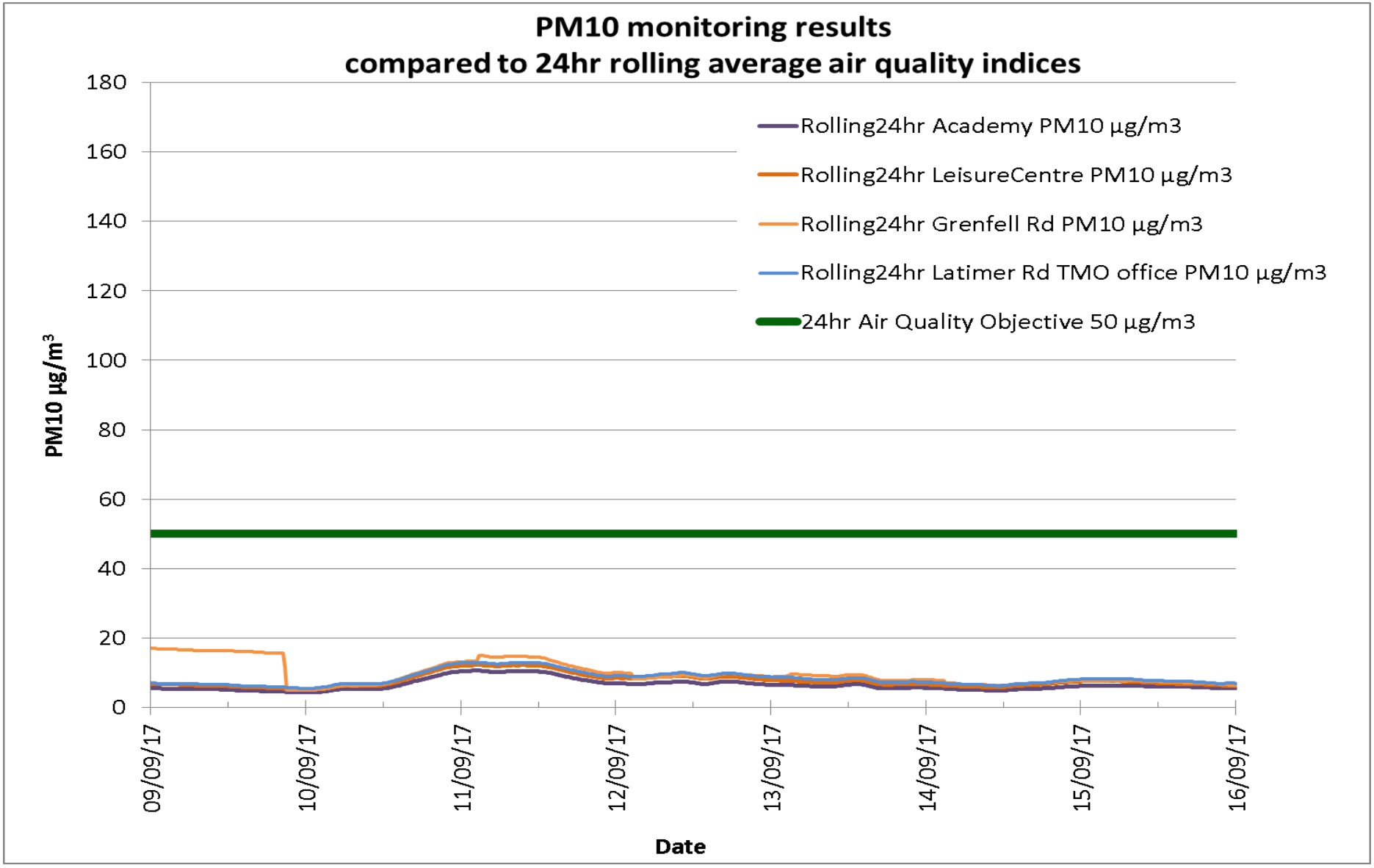
PM10 µg/m³
Rolling24hr Academy PM10 µg/m3
Rolling24hr LeisureCentre PM10 µg/m3
Rolling24hr Grenfell Rd PM10 µg/m3
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
02/09/17
03/09/17
04/09/17
05/09/17
06/09/17
07/09/17
08/09/17
09/09/17
Date

Figure 12


PM10 monitoring results
compared to 24hr rolling average air quality indices
PM10 µg/m³
180
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09/09/17
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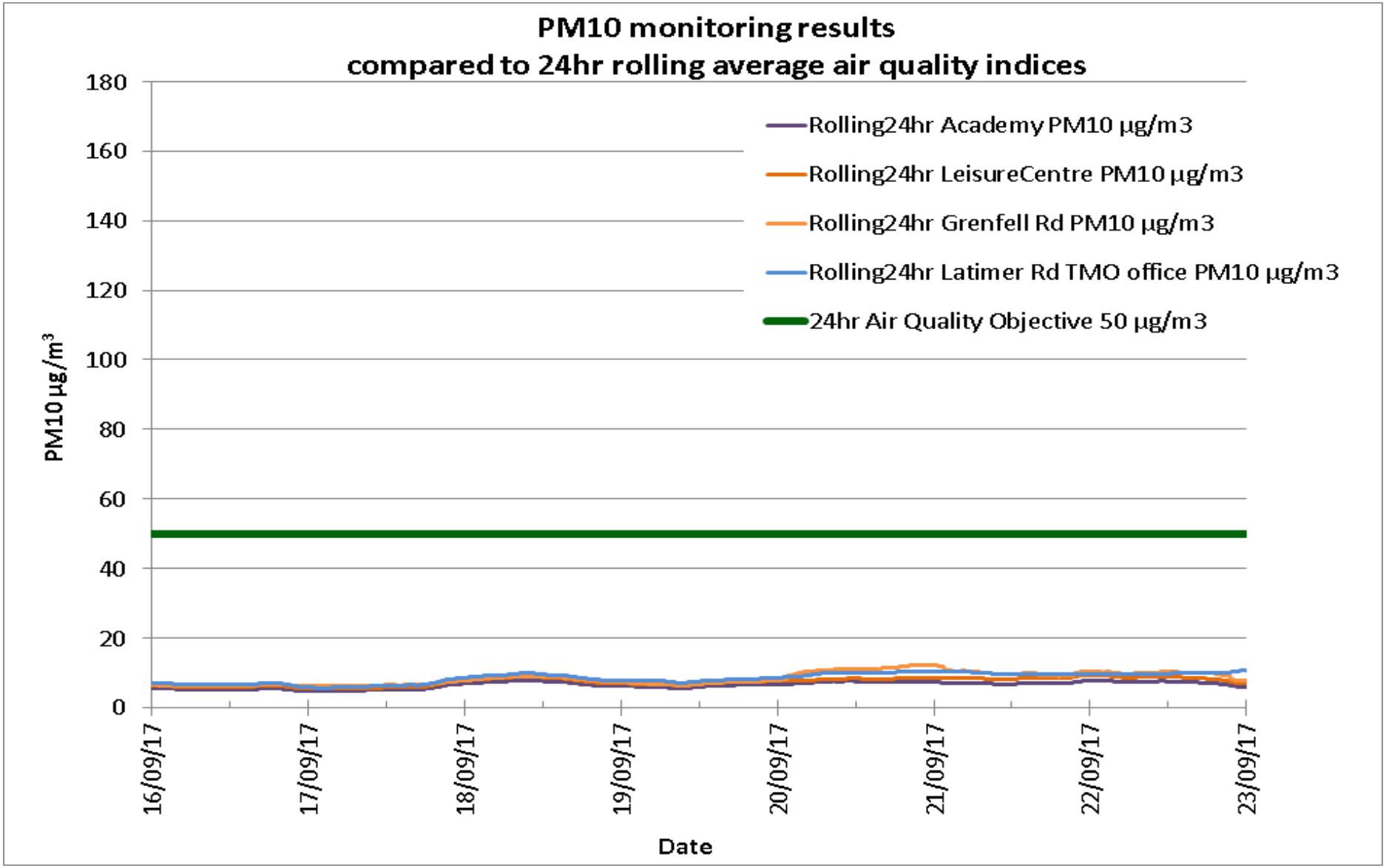
11/09/17
12/09/17
13/09/17
14/09/17
15/09/17
16/09/17
Date
Rolling24hr Academy PM10 µg/m3
Rolling24hr LeisureCentre PM10 µg/m3
Rolling24hr Grenfell Rd PM10 µg/m3
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3

Figure 13


PM10 monitoring results
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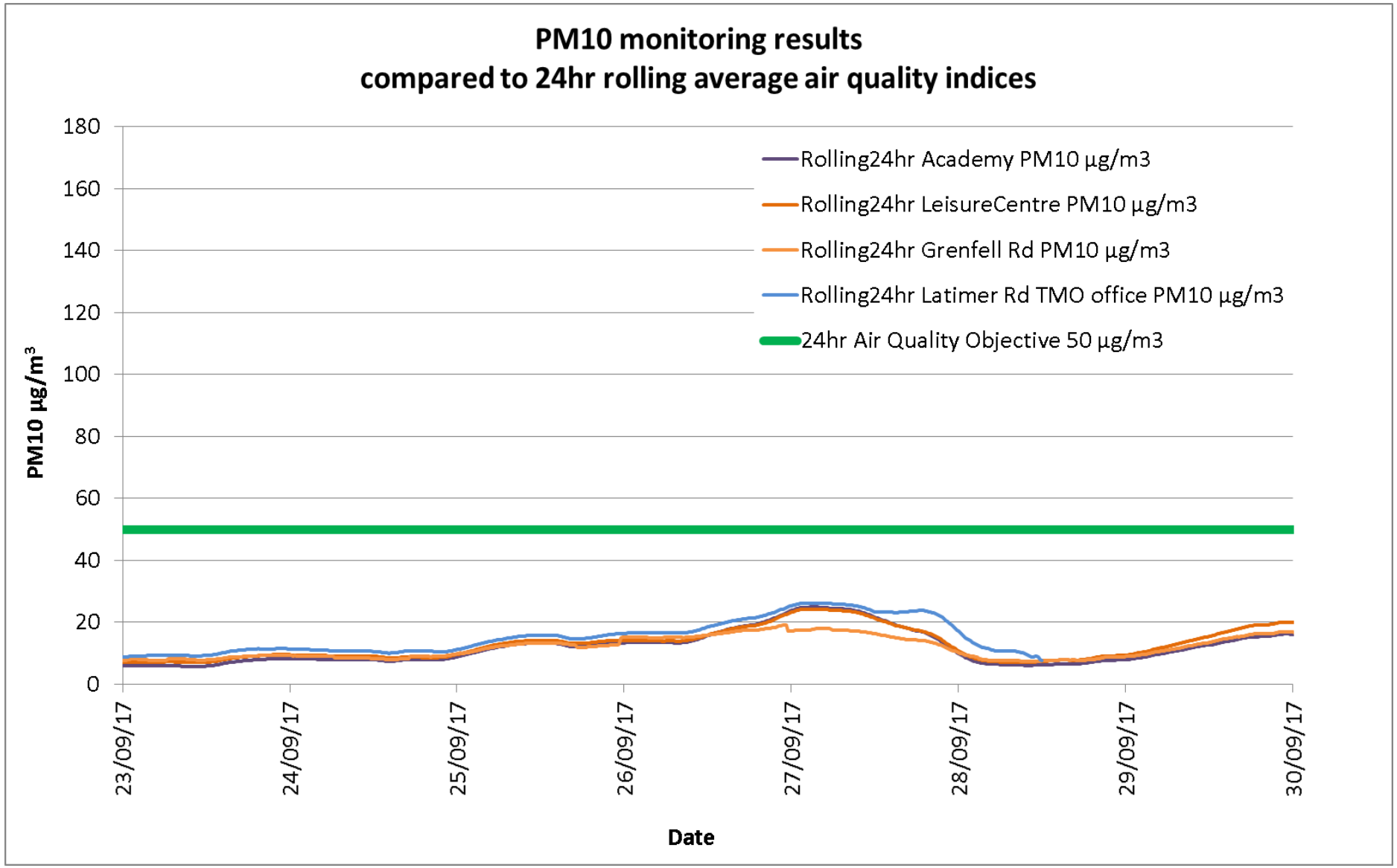
PM10 µg/m3
Rolling24hr Academy PM10 µg/m3
Rolling24hr LeisureCentre PM10 µg/m3
Rolling24hr Grenfell Rd PM10 µg/m3
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
16/09/17
17/09/17
18/09/17
19/09/17
20/09/17
21/09/17
22/09/17
23/09/17
Date

Figure 14


PM10 monitoring results
compared to 24hr rolling average air quality indices
PM10 µg/m³
180
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Rolling24hr Academy PM10 µg/m3
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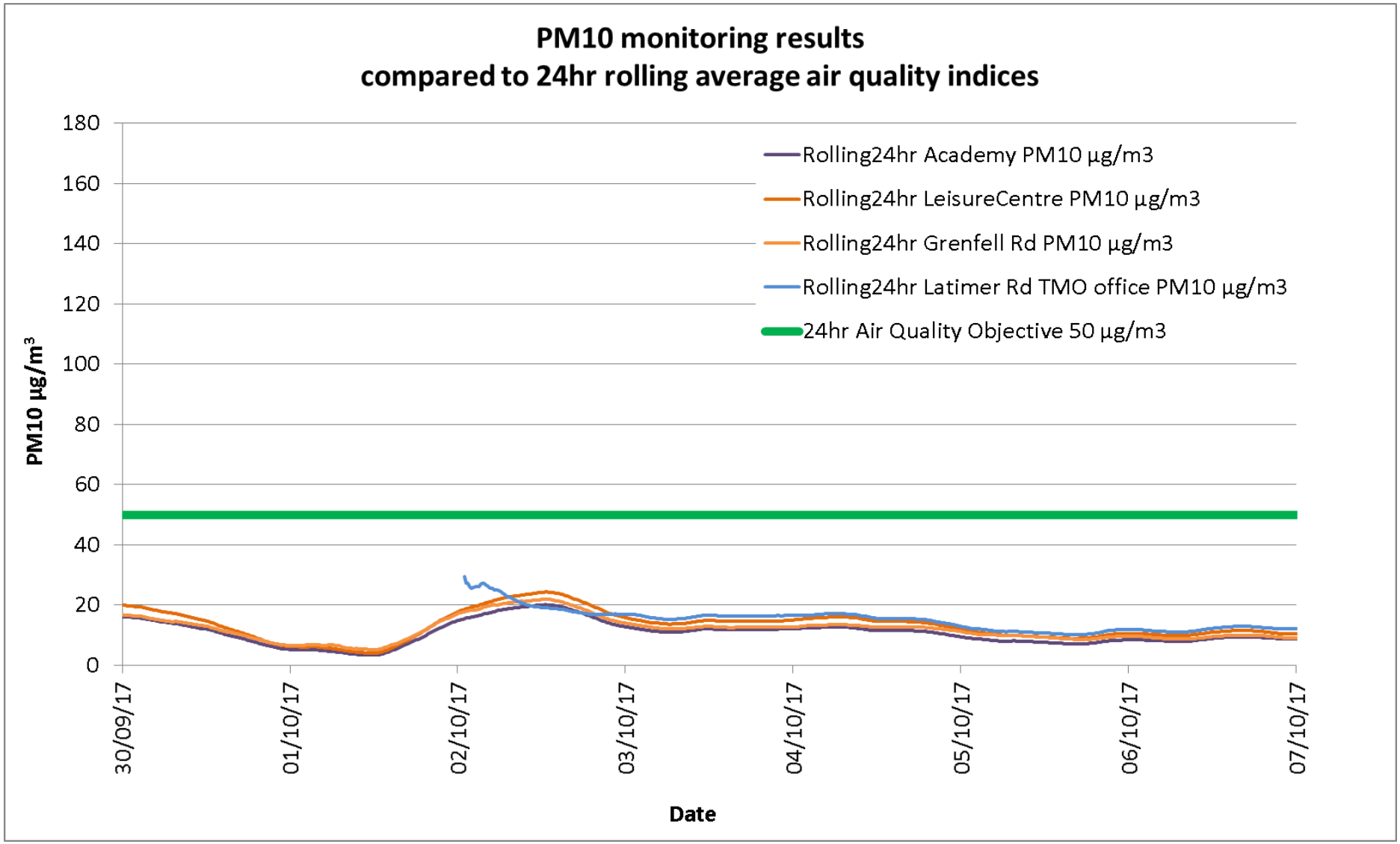
Rolling24hr Grenfell Rd PM10 µg/m3
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
23/09/17
24/09/17
25/09/17
26/09/17
27/09/17
28/09/17
29/09/17
30/09/17
Date

Figure 15


PM10 monitoring results
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180
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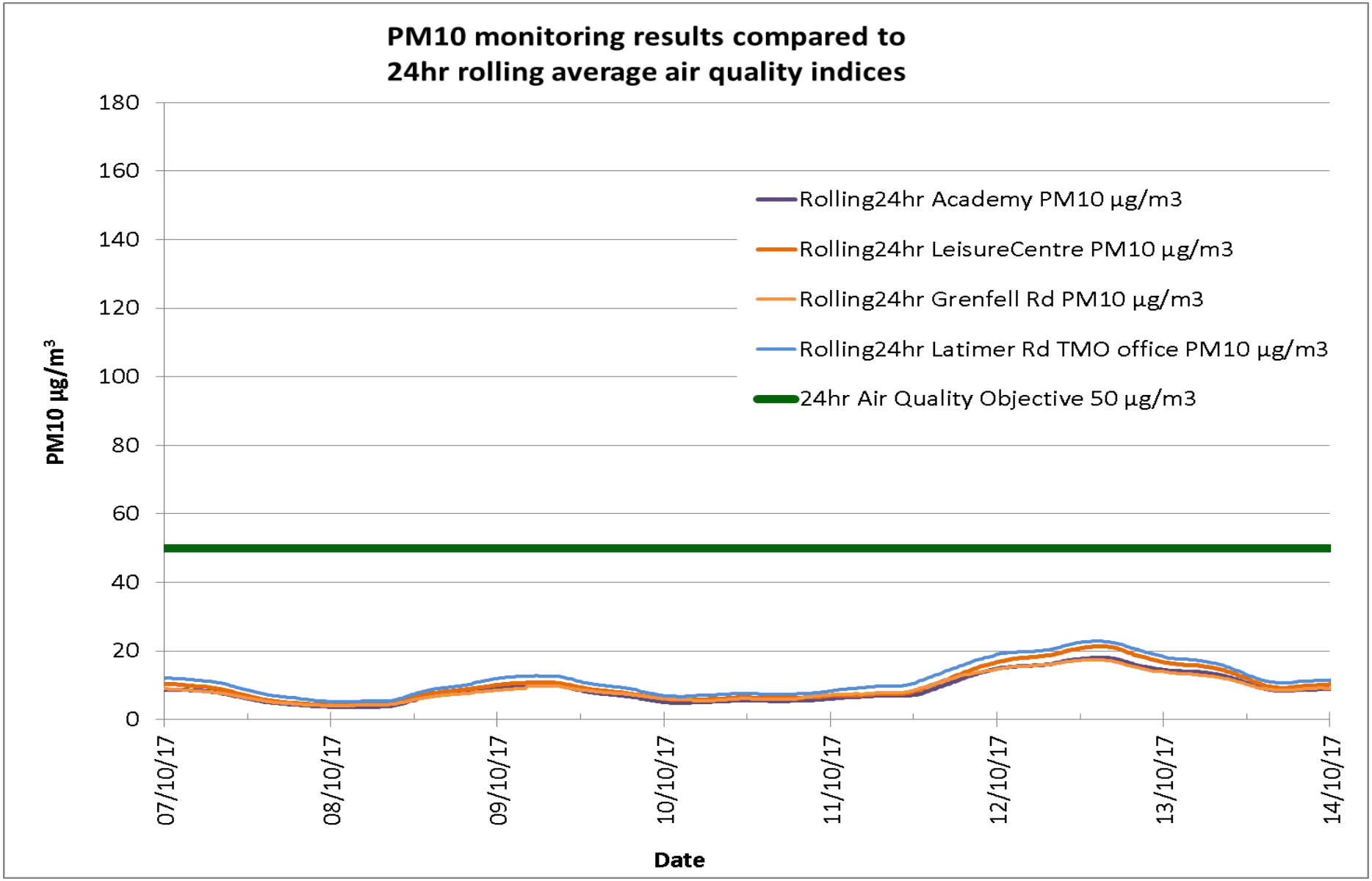
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
30/09/17
01/10/17
02/10/17
03/10/17
04/10/17
05/10/17
06/10/17
07/10/17
Date

Figure 16


PM10 monitoring results compared to
24hr rolling average air quality indices
PM10 µg/m³
180
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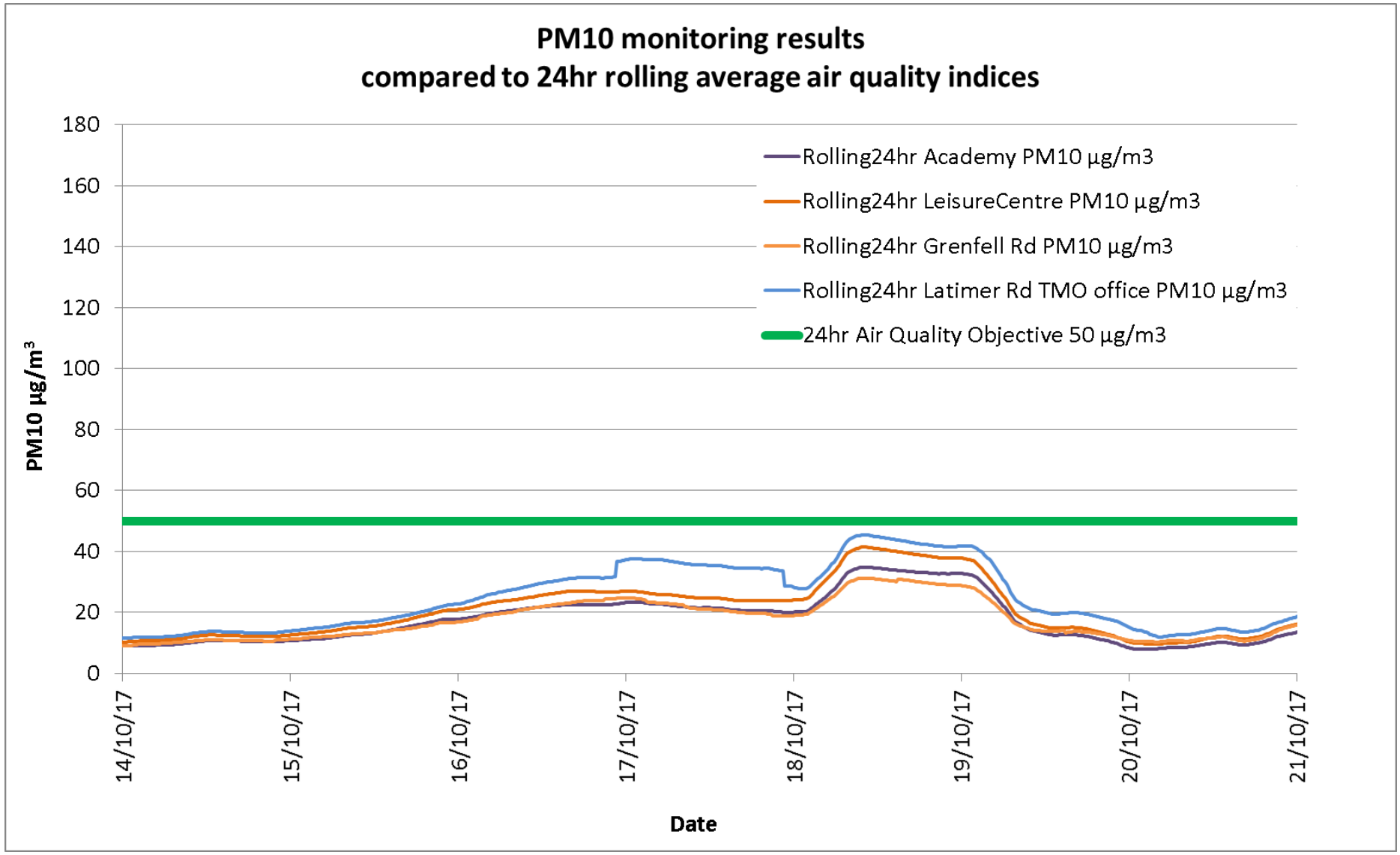
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
07/10/17
08/10/17
09/10/17
10/10/17
11/10/17
12/10/17
13/10/17
14/10/17
Date

Figure 17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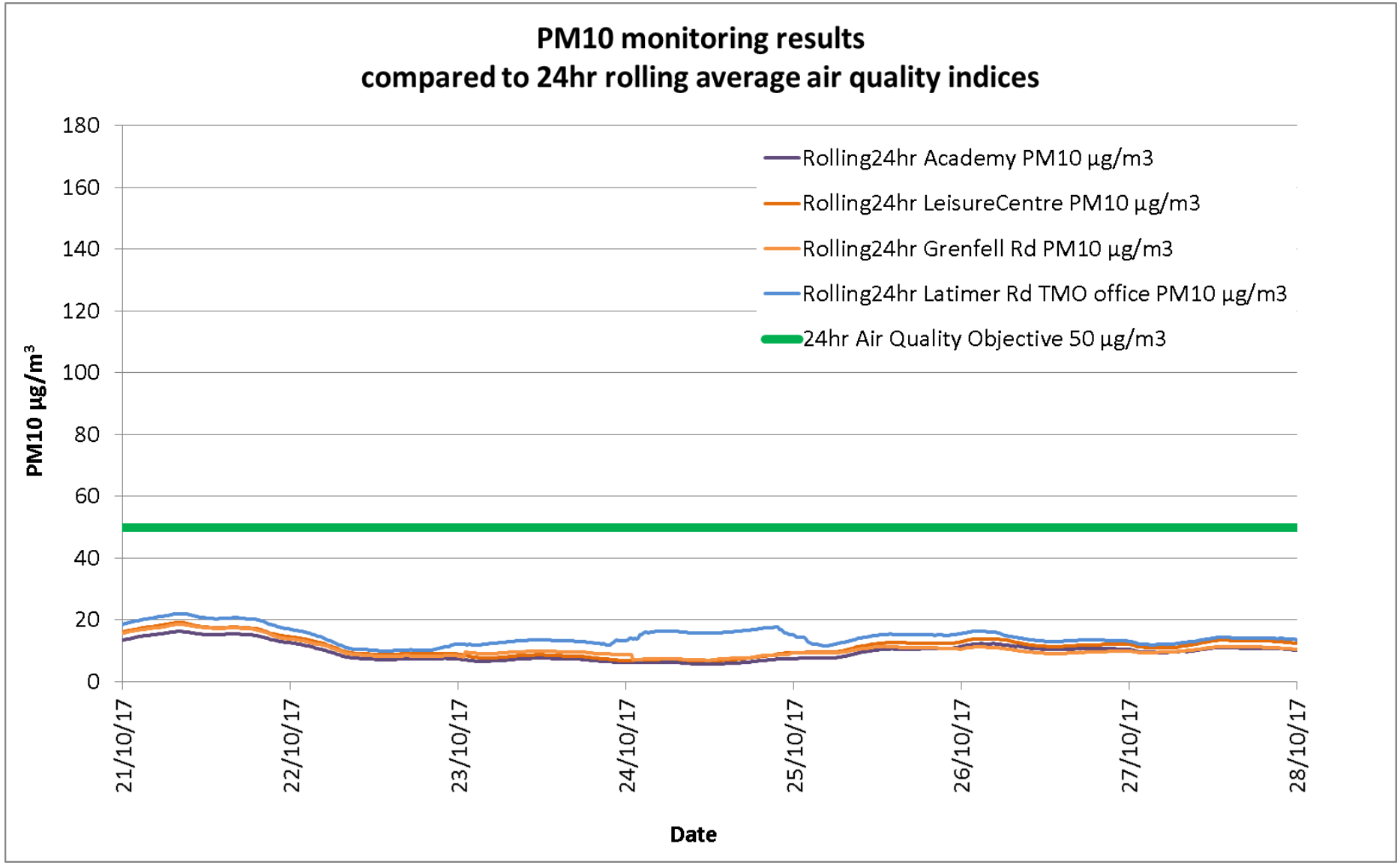
Rolling24hr Grenfell Rd PM10 µg/m3
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
14/10/17
15/10/17
16/10/17
17/10/17
18/10/17
19/10/17
20/10/17
21/10/17
Date

Figure 18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compared to 24hr rolling average air quality indices
PM10 µg/m³
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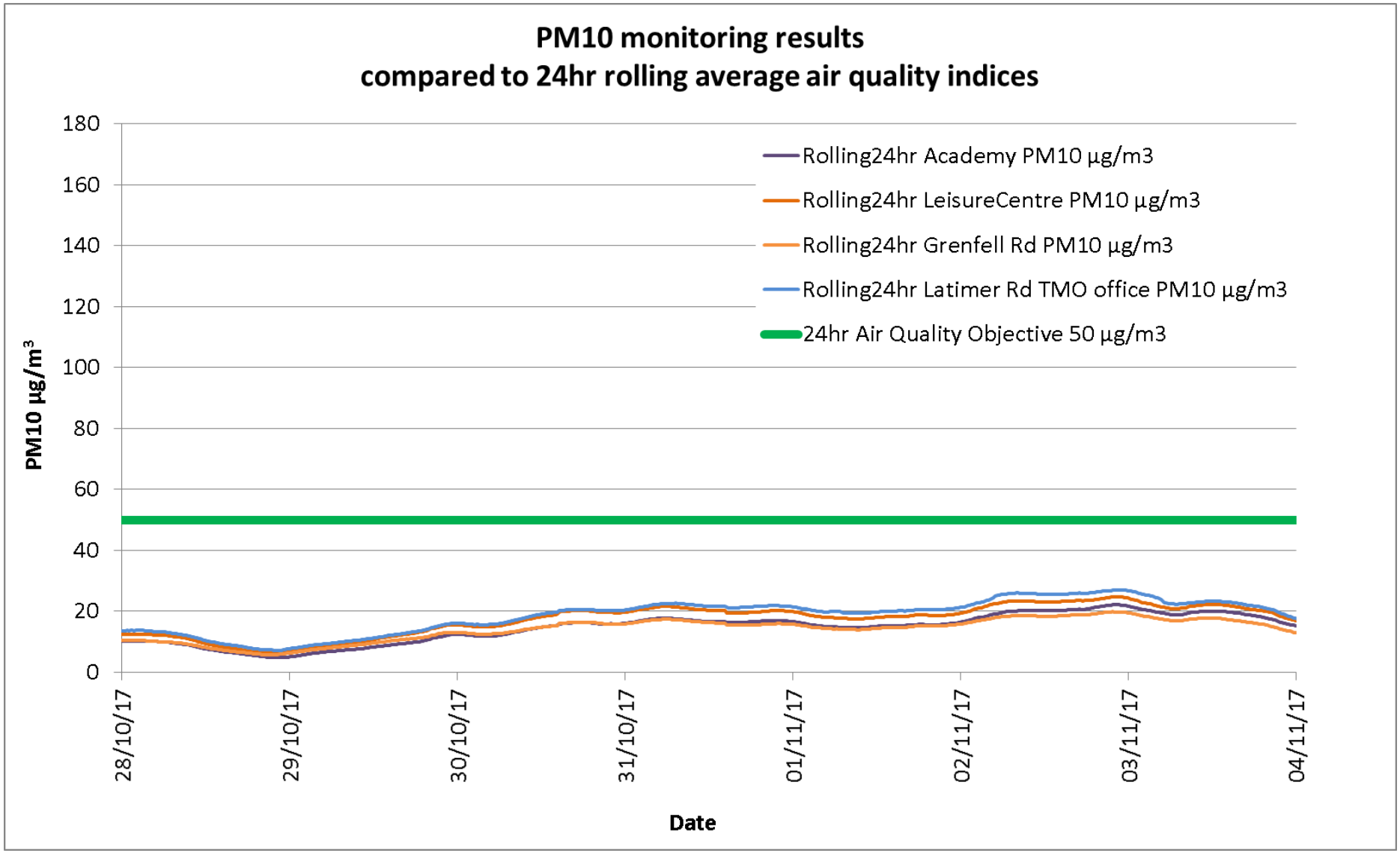
Rolling24hr Grenfell Rd PM10 µg/m3
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
21/10/17
22/10/17
23/10/17
24/10/17
25/10/17
26/10/17
27/10/17
28/10/17
Date

Figure 19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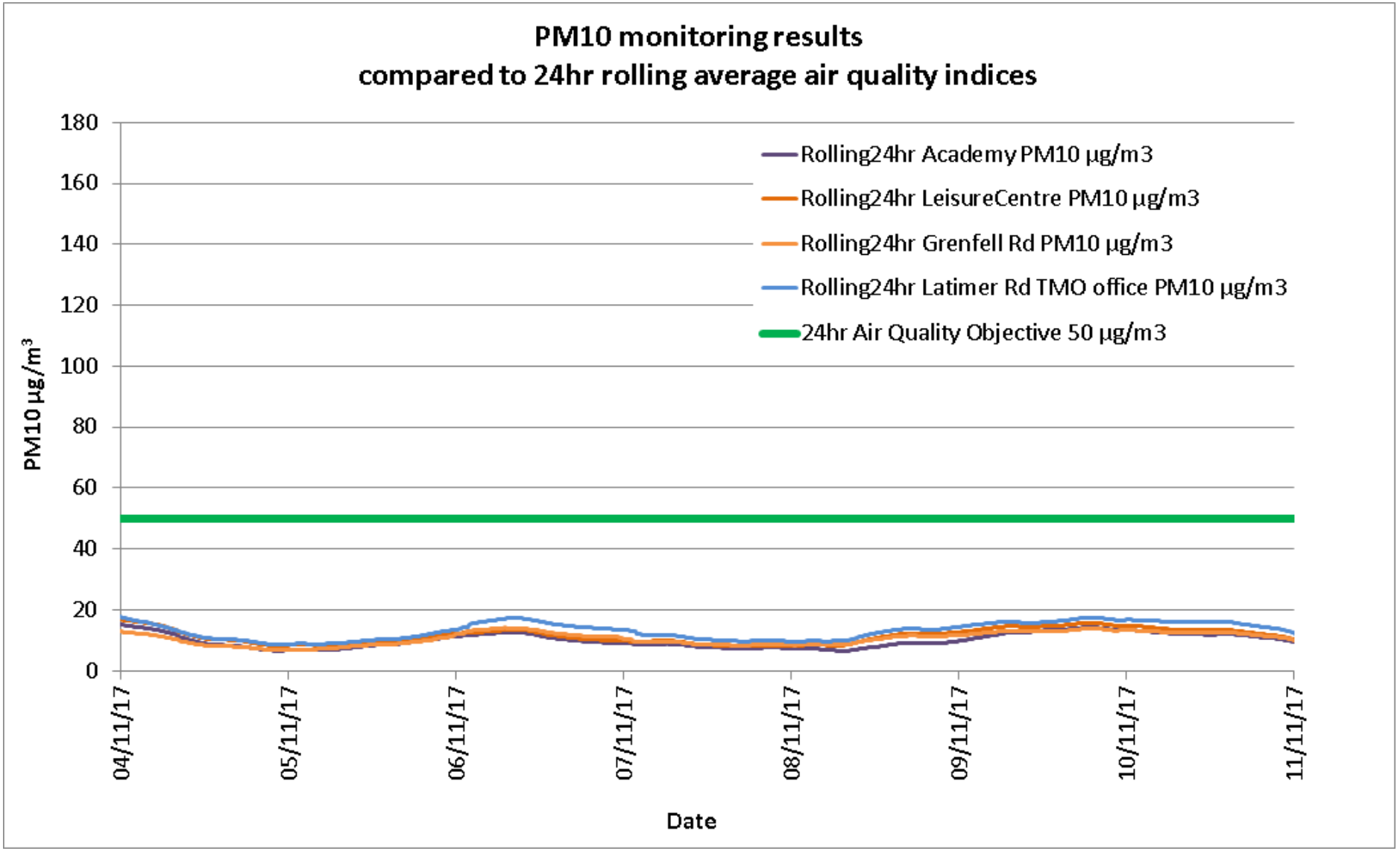
24hr Air Quality Objective 50 µg/m3
28/10/17
29/10/17
30/10/17
31/10/17
01/11/17
02/11/17
03/11/17
04/11/17
Date

Figure 20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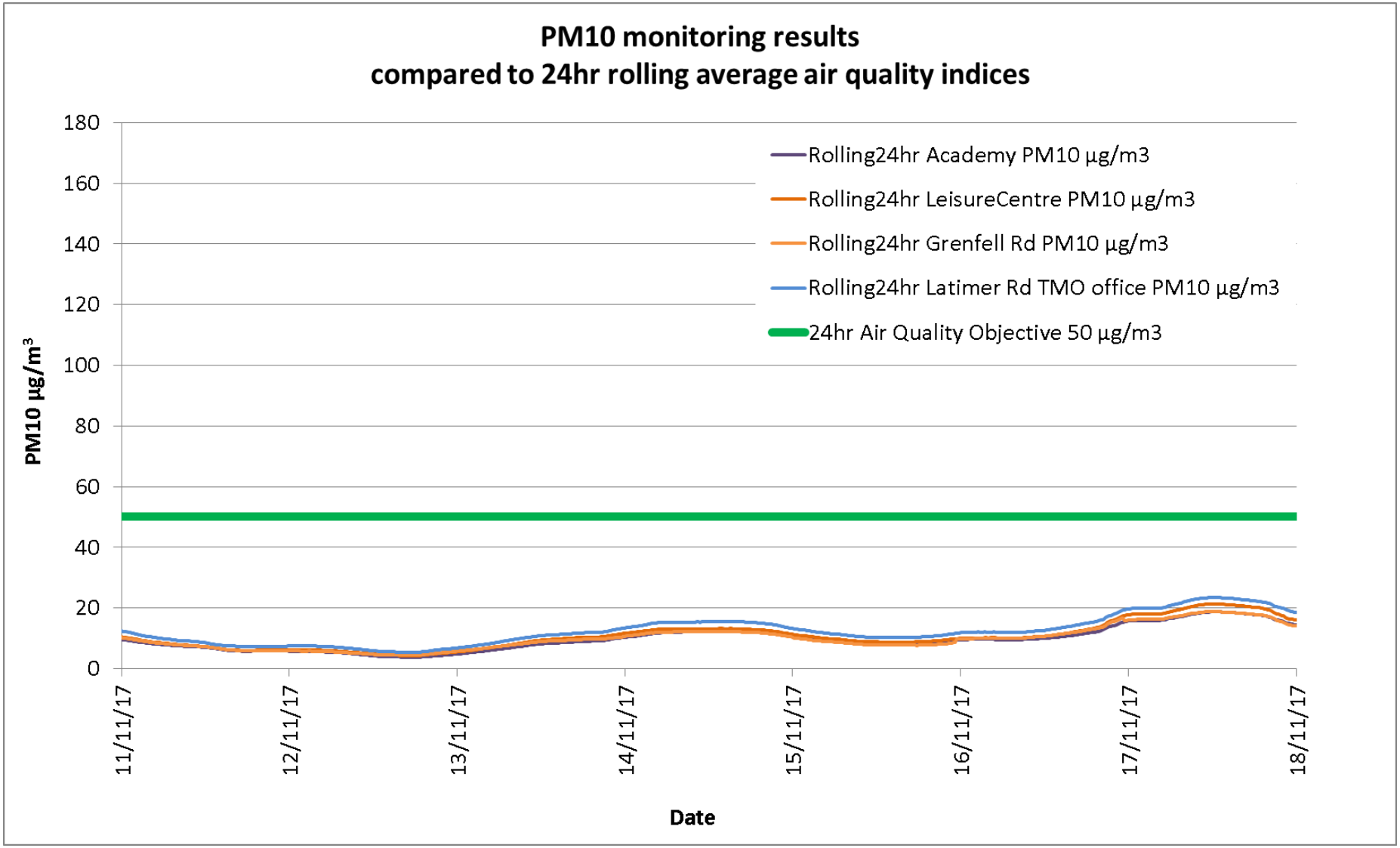
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3
04/11/17
05/11/17
06/11/17
07/11/17
08/11/17
09/11/17
10/11/17
11/11/17
Date

Figure 21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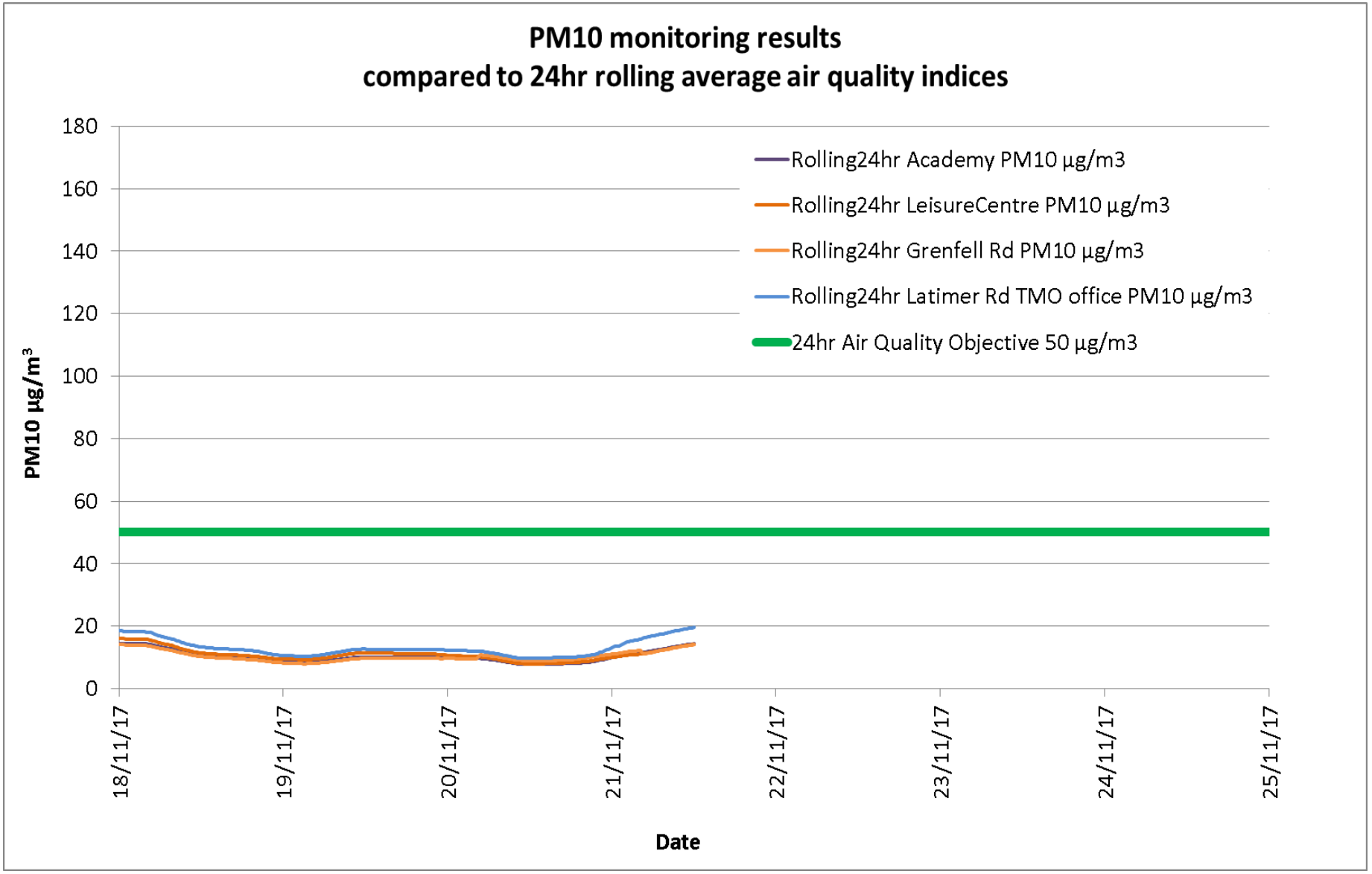
24hr Air Quality Objective 50 µg/m3
11/11/17
12/11/17
13/11/17
14/11/17
15/11/17
16/11/17
17/11/17
18/11/17
Date

Figure 22


PM10 monitoring results
compared to 24hr rolling average air quality indices
PM10 µg/m3
180
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140
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60
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20
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18/11/17
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20/11/17
21/11/17
22/11/17
23/11/17
24/11/17
25/11/17
Date
Rolling24hr Academy PM10 µg/m3
Rolling24hr LeisureCentre PM10 µg/m3
Rolling24hr Grenfell Rd PM10 µg/m3
Rolling24hr Latimer Rd TMO office PM10 µg/m3
24hr Air Quality Objective 50 µg/m3

Dioxin, furan, dioxin-like polychlorinated biphenyl (PCB) and polycyclic aromatic hydrocarbon (PAH) results

Concentrations of dioxins, furans and dioxin-like polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs) are being measured at two locations close to Grenfell Tower, on the Kensington Academy roof and on Grenfell Road. The monitoring data reviewed here covers the periods from 3 to 31 July 2017, 31July to 25 August 2017 and 25th August to 22nd September.

The term 'dioxins' is commonly used to refer to a group of over 200 compounds, including polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDDs and PCDFs), of which less than 20 are considered to be biologically active. In addition, twelve of the 209 polychlorinated biphenyls (PCBs) exhibit similar biological activity to dioxins, and are therefore referred to as "dioxin-like PCBs"[1].

Dioxin-like compounds normally exist in the environment as mixtures of compounds (congeners). During risk assessments, because these compounds have similar biological effects they can be assessed on a toxic equivalency (TEQ) basis, in which each compound is assigned a relative potency compared to the reference compound 2,3,7,8-tetrachloro dibenzo-p-dioxin. The total toxicity of the sample is calculated by adding together all the TEQs for the detected compounds[2].

Dioxin, Furan and PCB concentrations measured at Kensington Academy during 3 to 31 July 2017:

Compound	Result (ng*)	WHO TEQ (ng*)	Air Volume (m^3)	WHO TEQ (fg°°/m^3)
Dioxins				
1,2,3,4,6,7,8-HpCDD	0.036	0.00036	675.38	0.53
OCDD	0.009	0.00001	675.38	0.01
Furans				
1,2,3,4,6,7,8-HpCDF	0.014	0.00014	675.38	0.21
PCBs				
PCB BZ#118	3.3	0.00033	675.38	0.49
PCB BZ#105	1.1	0.00011	675.38	0.16
Total				**1.40**

*ng= nanogram 1 billionth of a gram (10^{-9})

°°fg = femtogram 1 millionth of a nanogram (10^{-15})

[1] https://cot.food.gov.uk/cotstatements/cotstatementsyrs/cotstatements2001/dioxinsstate
[2] http://www.euro.who.int/__data/assets/pdf_file/0016/123064/AQG2ndEd_5_10PCBs.PDF

Dioxin, Furan and PCB measured at Kensington Academy during 31July to 25 August 2017:

Compound	Result (ng*)	WHO TEQ (ng*)	Air Volume (m^3)	WHO TEQ (fg^{∞}/m^3)
Dioxins				
1,2,3,4,6,7,8-HpCDD	0.023	0.00023	605.92	0.38
OCDD	0.052	0.00001	605.92	0.02
Furans				
1,2,3,4,6,7,8-HpCDF	0.0097	0.00010	605.92	0.16
OCDF	0.0053	0.0000***	605.92	0.00
Total				**0.56**

*ng= nanogram 1 billionth of a gram (10^{-9})

∞fg = femtogram 1 millionth of a nanogram (10^{-15})

***A WHO TEQ result of 0 is reported due to rounding, as the result is multiplied by 0.0001 due to the weak dioxin-like activity of OCDF

Dioxin, Furan and PCB concentrations measured at Kensington Academy during 25 August to 22 September 2017:

Compound	Result (ng*)	WHO TEQ (ng*)	Air Volume (m^3)	WHO TEQ (fg^{∞}/m^3)
Dioxins				
1,2,3,4,6,7,8-HpCDD	0.040	0.00040	687.01	0.58
OCDD	0.099	0.00001	687.01	0.01
Furans				
1,2,3,4,6,7,8-HxCDF	0.0074	0.00074	687.01	1.08
2,3,4,6,7,8-HxDF	0.0080	0.00080	687.01	1.16
1,2,3,4,6,7,8-HpCDF	0.019	0.00019	687.01	0.28
OCDF	0.017	0.00000***	687.01	0.00
PCBs				
PCB BZ#118	3.1	0.00031	687.01	0.45
PCB BZ#105	0.9	0.00009	687.01	0.13
Total				**3.69**

*ng= nanogram 1 billionth of a gram (10^{-9})

∞fg = femtogram 1 millionth of a nanogram (10^{-15})

***A WHO TEQ result of 0 is reported due to rounding, as the result is multiplied by 0.0001 due to the weak dioxin-like activity of OCDF

Dioxin, Furan and PCB concentrations measured at Grenfell Road during 3 to 31 July 2017:

Compound	Result (ng*)	WHO TEQ (ng*)	Air Volume (m^3)	WHO TEQ (fg∞/m^3)
Dioxins				
1,2,3,4,6,7,8-HpCDD	0.023	0.00023	672.06	0.34
Furans				
1,2,3,4,7,8-HxCDF	0.0078	0.00078	672.06	1.16
2,3,4,6,7,8-HxCDF	0.0078	0.00078	672.06	1.16
1,2,3,4,6,7,8-HpCDF	0.014	0.00014	672.06	0.21
PCBs				
PCB BZ#118	4.6	0.00046	672.06	0.68
PCB BZ#105	1.3	0.00013	672.06	0.19
Total				**3.74**

*ng= nanogram 1 billionth of a gram (10^{-9})

∞fg = femtogram 1 millionth of a nanogram (10^{-15})

Dioxin, Furan and PCB concentrations measured at Grenfell Road during 31July to 25 August 2017

Compound	Result (ng*)	WHO TEQ (ng*)	Air Volume (m^3)	WHO TEQ (fg∞/m^3)
Dioxins				
1,2,3,4,6,7,8-HpCDD	0.029	0.00029	617.42	0.47
OCDD	0.069	0.00001	617.42	0.02
Furans				
1,2,3,4,6,7,8-HpCDF	0.011	0.00011	617.42	0.18
OCDF	0.0067	0.00000***	617.42	0.00
PCBs				
PCB BZ#118	3.3	0.00033	617.42	0.53
PCB BZ#105	1	0.00010	617.42	0.16
Total				**1.36**

*ng= nanogram 1 billionth of a gram (10^{-9})

∞fg = femtogram 1 millionth of a nanogram (10^{-15})

***A WHO TEQ result of 0 is reported due to rounding, as the result is multiplied by 0.0001 due to the weak dioxin-like activity of OCDF

Dioxin, Furan and PCB concentrations measured at Grenfell Road during 25 August to 22 September 2017

Compound	Result (ng*)	WHO TEQ (ng*)	Air Volume (m^3)	WHO TEQ (fg∞/m^3)
Dioxins				
1,2,3,4,6,7,8-HpCDD	0.0037	0.00037	691.83	0.53
OCDD	0.0053	0.00001	691.83	0.01
PCBs				
PCB BZ#118	2.4	0.00024	691.83	0.35
PCB BZ#105	0.8	0.00008	691.83	0.12
Total				**1.01**

*ng= nanogram 1 billionth of a gram (10^{-9})

∞fg = femtogram 1 millionth of a nanogram (10^{-15})

***A WHO TEQ result of 0 is reported due to rounding, as the result is multiplied by 0.0001 due to the weak dioxin-like activity of OCDF

The dioxin-like activity detected in the air around the Grenfell site is comparable to the most recent data currently available for London. The dioxin-like activity levels were 1.40 fg WHO-1998 TEQ/$m^{3,}$ 0.56 fg WHO-1998 TEQ/m^3 and 3.69 fg WHO-1998 TEQ/m^3 at the Grenfell Academy site during the first (3-31 July 2017), second (31 July 2017 to 25 August 2017) and third (25th August - 22nd September 2017) monitoring periods, respectively. At the Grenfell Road site, dioxin-like activity was measured at 3.74 fg WHO1998-TEQ/m^3, 1.36 fg WHO1998-TEQ/m^3 and 1.01 fg WHO1998-TEQ/m^3 during the first, second and third monitoring periods, respectively. In comparison the average 2015 dioxin-like activity in London was 4.3 fg WHO1998-TEQ/m^3 (based on detected dioxin and furan congeners only) as measured by the Toxic Organic Micro Pollutant (TOMPS) monitoring network.

Polycyclic aromatic hydrocarbons

Polycyclic aromatic hydrocarbons (PAHs) are a diverse class of organic compounds. There are several hundred PAHs, which usually occur as complex mixtures rather than as individual compounds. Sixteen of these compounds have been designated High Priority Pollutants by the US Environmental Protection Agency (EPA) because of their potential toxicity to humans and their prevalence and environmental persistence.

PAH, Kensington Academy

A mechanical failure of the sampling pump has invalidated results. The problem has now been rectified and future results will be available.

PAH, Grenfell Road

Compound	Result (ng)	Air volume (m^3)	Result (ng/m^3)	Concentraion range in London (2015/16) (ng/m^3)
Benzo(b/k)Fluoranthene	37	509.62	0.07	0.01 - 0.65
Benzo(ghi)Perylene	21	509.62	0.04	0.12 - 0.39
Chrysene	13	509.62	0.03	0.01 - 0.70
Fluoranthene	13	509.62	0.03	-
Indeno(123-cd)Pyrene	14	509.62	0.03	0.04 - 0.46
Pyrene	11	509.62	0.02	-

*ng= nanogram 1 billionth of a gram (10^{-9})

The concentrations of the majority of PAHs detected are comparable or lower than the monthly levels detected in London during 2015/16. No comparable data is available for 2 of the PAHs, however the detected concentrations are low.

At the Grenfell Road sampling site, six of the 15 PAHs were detected at concentrations greater than the limit of detection. The concentrations for four of these PAHs have been compared with data from London sites on Defra's PAH network and were found to be within or below the ranges reported for monthly concentrations during 2015 and 2016. The highest measured concentration was for Benzo(b/k)Fluoranthene, which was 0.07 ng/m^3 and the others were at or below 0.04ng/m^3.

For two of the PAHs, no data was available on the PAH network for the London sites but the concentrations were also low: Fluoranthene (0.03ng/m^3) and Pyrene (0.02ng/m^3).

Asbestos monitoring results

Date	Location	Phase contrast microscopy (PCM) f/ml	Scanning electron microspcopy (SEM) f/ml	Comments
30/06/2017	**Silchester Rd (A)**	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
	Grenfell Rd (B)	<0.004	<0.001^{+}	No asbestos detected on SEM
	Grenfell Walk (C)	<0.004	<0.001^{+}	No asbestos detected on SEM
03/07/2017	**Silchester Rd (A)**	<0.004	-	
	Grenfell Rd (B)	<0.004	-	
	Grenfell Walk (C)	<0.004	-	
	Silchester Rd (A)	<0.004	-	
	Grenfell Rd (B)	<0.004	0.001	No asbestos detected on SEM
	Grenfell Walk (C)	<0.004	<0.001^{+}	No asbestos detected on SEM
07/07/2017	**Silchester Rd (A)**	<0.004	-	
	Kensington Academy (D) *	<0.004	<0.001^{+}	* combined sample No asbestos detected on SEM
	Kensington Academy (D) *			
	Grenfell Walk (C)	<0.004	0.001	No asbestos detected on SEM
	Grenfell Rd (B)	<0.004	-	
	Off-site background (E)	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
	Silchester Rd (A)	<0.004	-	
	Grenfell Rd (B)	<0.004	-	
	Grenfell Walk (C)	<0.004	-	
12/07/2017	**Silchester Rd (A)**	<0.004	-	
	Grenfell Rd (B)	<0.004	-	
	Grenfell Walk (C)	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
	Silchester Rd (A)	<0.004	-	
	Grenfell Rd (B)	<0.004	-	
	Grenfell Walk (C)	<0.004	-	
16/07/2017	**Silchester Rd (A)**	<0.004	-	
	Grenfell Rd (B)	<0.004	-	
	Grenfell Walk (C)	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
	Silchester Rd (A)	<0.004	-	
	Grenfell Rd (B)	<0.004	<0.001^{+}	No asbestos detected on SEM
	Grenfell Walk (C)	<0.004	-	
20/07/2017	**Silchester Rd (A)**	<0.004	-	
	Grenfell Rd (B)	<0.004	-	
	Grenfell Walk (C)	<0.004	-	

Date	Location	Phase contrast microscopy (PCM) f/ml	Scanning electron microspcopy (SEM) f/ml	Comments
20/07/2017 continued	**Silchester Rd (A)**	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
	Grenfell Rd (B)	<0.004	-	
	Grenfell Walk (C)	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
25/07/2017	**Silchester Rd (A)**	<0.004	-	
	Grenfell Rd (B)	<0.004	<0.001^{+}	
	Grenfell Walk (C)	<0.004	-	
	Silchester Rd (A)	<0.004	-	
	Grenfell Rd (B)	<0.004	-	
	Grenfell Walk (C)	<0.004	-	
29/07/2017	**Silchester Rd (A)**	<0.004	-	
	Grenfell Rd (B2)	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
	Grenfell Walk (C2)	-	-	Pump failed
	Silchester Rd (A)	<0.004	-	
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
03/08/2017	**Silchester Rd (A)**	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004	<0.001^{+}	No asbestos detected on SEM
	Silchester Rd (A)	<0.004	<0.001^{+}	No asbestos detected on SEM
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
07/08/2017	**Silchester Rd (A)**	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A)	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004	<0.001^{+}	No asbestos detected on SEM
10/08/2017	**Silchester Rd (A)**	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A)	<0.004		
	Grenfell Rd (B2)	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
	Grenfell Walk (C2)	<0.004		
14/08/2017	**Silchester Rd (A)**	<0.004	<0.001^{+}	
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Kensington Academy (G)	<0.004	<0.001^{+}	No asbestos detected on SEM
	Silchester Rd (A)	<0.004		
	Grenfell Rd (B2)	<0.004		

Date	Location	Phase contrast microscopy (PCM) f/ml	Scanning electron microspcopy (SEM) f/ml	Comments
14/08/17 continued	**Grenfell Walk (C2)**	<0.004	<0.001^{+}	No asbestos detected on SEM
19/08/2017	**Silchester Rd (A)**	<0.004		
	Grenfell Rd (B)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A)	<0.004		
	Grenfell Rd (B)	<0.004	<0.001^{+}	No asbestos detected on SEM
	Grenfell Walk (C2)	<0.004		
24/08/2017	**Silchester Rd (A)**	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A)	<0.004		
	Grenfell Rd (B2)	<0.004	ND <0.001 +	ND = No fibres detected No asbestos detected on SEM
	Grenfell Walk (C2)	<0.004	ND <0.001 +	ND = No fibres detected No asbestos detected on SEM
01/09/2017	**Silchester Rd (A)**	<0.004		
	Grenfell Rd (B2)	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A)	<0.004		
	Grenfell Rd (B2)	<0.004	<0.001^{+}	No asbestos detected on SEM
	Grenfell Walk (C2)	<0.004		
08/09/2017	**Silchester Rd (A)**	<0.004		
	Grenfell Rd (B2)	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A)	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004	<0.001^{+}	No asbestos detected on SEM
11/09/2017	**Silchester Rd (A)**	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004	<0.001^{+}	No asbestos detected on SEM
15/09/2017	**Silchester Rd (A2)**	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A2)	<0.004		
	Grenfell Rd (B2)	<0.004	ND <0.001^{+}	ND = No fibres detected No asbestos detected on SEM
	Grenfell Walk (C2)	<0.004		
19/09/2017	**Silchester Rd (A2)**	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A2)	<0.004		
	Grenfell Rd (B2)	<0.004		

Date	Location	Phase contrast microscopy (PCM) f/ml	Scanning electron microspcopy (SEM) f/ml	Comments
19/09/2017	**Grenfell Walk (C2)**	<0.004	ND <0.001+	ND = No fibres detected No asbestos detected on SEM
22/09/2017	**Silchester Rd (A2)**	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A2)	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004	ND <0.001+	ND = No fibres detected No asbestos detected on SEM
29/09/2017	**Silchester Rd (A2)**	<0.005	ND <0.002+	ND = No fibres detected No asbestos detected on SEM
	Grenfell Rd (B2)	<0.005	ND <0.002+	ND = No fibres detected No asbestos detected on SEM
	Grenfell Walk (C2)	<0.005		
04/10/2017	**Silchester Rd (A2)**	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A2)	<0.004	<0.001+	No asbestos detected on SEM
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004	<0.001+	No asbestos detected on SEM
09/10/2017	**Silchester Rd (A2)**	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A2)	<0.004	*Awaiting result*	
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
12/10/2017	**Silchester Rd (A2)**	<0.004		
	Grenfell Rd (B2)	<0.004	*Awaiting result*	
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A2)	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
16/10/2017	**Silchester Rd (A2)**	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A2)	<0.004	*Awaiting result*	
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004	*Awaiting result*	
20/10/2017	**Silchester Rd (A2)**	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A2)	<0.004	*Awaiting result*	
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		

Date	Location	Phase contrast microscopy (PCM) f/ml	Scanning electron microspcopy (SEM) f/ml	Comments
25/10/2017	**Silchester Rd (A2)**	<0.004	*Awaiting result*	
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004	*Awaiting result*	
	Silchester Rd (A2)	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
30/10/2017	**Silchester Rd (A2)**	<0.004	*Awaiting result*	
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A2)	<0.004	*Awaiting result*	
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
03/11/2017	**Silchester Rd (A2)**	<0.004		
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		
	Silchester Rd (A2)	<0.004	*Awaiting result*	
	Grenfell Rd (B2)	<0.004		
	Grenfell Walk (C2)	<0.004		

[+] identifies the limit of detection

The environmental asbestos monitoring results to date indicate levels at or below the limit of detection, and no asbestos fibres have been identified by scanning electron microscopy.

Asbestos air sampling is being carried out using some of the methods set out in the Health & Safety Executive's HSG 248. This involves drawing a volume of air across a filter using a pump. The filters are then prepared and analysed in a laboratory.

In the method used by laboratories we have commissioned, the air sample filters are analysed by two different methods: phase contrast microscopy and electron microscopy.

Phase contrast microscopy identifies fibres that meet the dimensions of a respirable fibre, but does not differentiate between asbestos and non-asbestos fibres. This is why we are also analysing a proportion of the samples taken by electron microscopy.

The laboratory analysing the samples uses scanning electronic microscopy. Electron microscopy does differentiate between fibre types, which is why we are able to say with confidence that the fibres identified to date are not asbestos.

Health information

Particulate matter

Particulate matter (PM) is a term used to describe the mixture of solid particles and liquid droplets in the air. It can be either human-made or naturally occurring. Some examples include dust, ash and sea-spray. Particulate matter (including soot) is emitted during combustion, eg fires, or for power generation, domestic heating and in vehicle engines. Particulate matter varies in size (ie the diameter or width of the particle). PM_{10} means the mass per cubic metre of air of particles with a size (diameter) generally less than 10 micrometres (µm). The size of these particles means that they are respirable and can be inhaled into the lungs.

Respirable particulates are chosen as a measure of air pollution, and can be compared to background levels across London and against health standards and the Daily Air Quality Index (DAQI). See: https://uk-air.defra.gov.uk/air-pollution/daqi?view=more-info&pollutant=pm10#pollutant

Health effects of PM

Inhalation of particulate air pollution can have adverse health impacts. The biggest impact of particulate air pollution on health is understood to be from long-term exposure. However, short term increases and exposures to high levels of PM can cause lung and heart problems, resulting in increased hospital admissions or in some cases deaths such as heart attacks. Children, the elderly and those with pre-existing respiratory and cardiovascular disease are known to be more susceptible to the health impacts from air pollution.

Asbestos

Asbestos is a general name given to several naturally occurring fibrous minerals that have crystallised to form fibres. Asbestos fibres do not dissolve in water or evaporate, they are resistant to heat, fire, chemical and biological degradation and are mechanically strong.

The properties of asbestos made it an ideal material for use in a number of products, including insulation material for buildings, boilers and pipes; car brakes and floor tiles, asbestos cement for roofing sheets and pipes.

Asbestos is widespread in the environment. It may enter the atmosphere due to the natural weathering of asbestos-containing ores or damage and breakdown of asbestos-

containing products including insulation, car brakes and clutches, ceiling and floor tiles and cement.

The use of asbestos has been banned in the UK since 1999. However, asbestos may be present in any house or building built before the year 2000 as it was widely used in a variety of building materials.

Health effects of asbestos

The presence of asbestos in the environment does not always lead to exposure as you must come into contact with the fibres. When damaged, asbestos can release smaller fibres that may be breathed in or swallowed. Following exposure to asbestos, the possibility of adverse health effects will depend on several factors, including the amount to which you are exposed (dose) and the duration of exposure.

If fibres are inhaled, asbestos may cause cancer of the lung, voice box or ovary, or mesothelioma (a type of cancer that forms on the protective tissue that covers the lungs or the abdomen). The risk of these cancers will depend on how much asbestos you are exposed to and for how long.

Breathing in high concentrations of asbestos for a long period of time mainly affects the lungs, causing a disease called asbestosis where breathing becomes difficult and the heart enlarges. Asbestosis may take decades to develop. Exposure to lower concentrations of asbestos over time may result in a general (diffuse pleural thickening) or localised (pleural plaques) thickening of the lung lining.

Dioxins

Dioxins are a group of over 200 chemicals formed from a number of sources such as forest fires and from industrial processes. Dioxins are also found in small quantities in cigarette smoke and vehicle emissions.

Dioxins are widespread in the general environment, and the main way people are exposed to dioxins is by eating food contaminated with them. Very small amounts are present in foods such as meat, dairy products and fish, thus we are all exposed to some extent over our lifetime. If dioxins are present in air, this is normally only a minor way people may be exposed compared to food.

Health effects of dioxins

Dioxins are likely to present a significantly greater hazard from long-term or repeated exposure than following a large single acute exposure, such as that associated with releases during a short-term fire.

At the levels which occur normally in food and the environment, dioxins are not expected to result in any adverse health effects. Small increases in exposure above background levels for short periods of time are unlikely to have any effect on health. The potential risks to health come if you are exposed for a long period of time above tolerable levels[3].

Very high concentrations of dioxins, compared to normal environmental levels, can cause an acne-like condition known as chloracne. Short-term exposure to high levels of dioxins may also cause nausea, vomiting and diarrhoea, liver damage and neurological effects, including headaches, weakness and muscular pains.

Long-term exposure to dioxins above tolerable levels may cause effects on the immune system, reproductive system, development of the foetus and young children, thyroid function, liver and cardiovascular effects and increase the risk of developing diabetes and mild neuropathies. The risk of these effects occurring will depend on the amount of dioxins you are exposed to and how long you are exposed for.

Dioxins can cause cancer in laboratory animals and there is evidence to suggest that exposure to dioxins at work in the past has been associated with an increase in the incidence of cancer in humans. Any risk of cancer development from a single exposure to dioxins is likely to be very low.

Polycyclic aromatic hydrocarbons

Polycyclic aromatic hydrocarbons (PAHs) are a diverse class of organic compounds. There are several hundred PAHs, which usually occur as complex mixtures rather than as individual compounds.

PAHs may be formed during natural processes such as incomplete combustion of organic materials, eg during forest fires or garden waste bonfires. PAHs are also formed during industrial processes including steel production plants and mining or oil refining. Motor vehicle emissions and cigarette smoke are also sources of PAHs in the environment.

PAHs have been found to be present in very small amounts in some foods including meat, fruit, vegetables and cereals. Various cooking processes such as charbroiling, frying or grilling, as well as barbequing or smoking also increases the amount of PAHs in food.

[3] Tolerable levels result in exposure at or below the tolerable daily intake (TDI), which is an estimate of the amount of a contaminant to which a person can be exposed daily over a lifetime without an appreciable risk to health. Tolerable daily intakes are derived from evidence from scientific studies.'

Overall, the major route of exposure to PAHs in the general population is from breathing outdoor and indoor air, eating food containing PAHs, cigarette smoke or breathing smoke from open fireplaces.

Health effects of PAHs

Adverse health effects from PAHs are more likely to occur following long-term or repeated exposure than following a single or short-term period of exposure. Inhalation exposure to normal background levels of PAHs is not considered to pose a significant risk to health.

Following short-term inhalation exposure to PAHs at levels above normal environmental levels there is the potential for signs of irritation to occur such as coughing and wheezing.

The effects of PAHs are of more concern after long-term exposure. For example, various studies on workers exposed to PAHs for prolonged periods of time suggest that inhalation exposure causes lung cancer and skin contact causes skin cancer.

Long-term exposure to PAHs may also have an effect on the lungs, the reproductive system and development of the unborn child and young children. The risks of these effects occurring will depend on the amount of PAHs you are exposed to and how long you are exposed for.

Further information

More detailed information on each of these chemicals is available via the following links:

- Particulates
- Asbestos
- Dioxins
- PAH

Other links:

- UK – Daily air quality index (DAQI)
- World Health Organisation Air Quality Guidelines
- London Air

Appendix 1: Monitoring data from North Kensington LAQN site from 12 June to 23 June

Data in the table below is taken from the North Kensington monitoring station in the grounds of Sion Manning School, St. Charles' Square, North Kensington. Further information about this site is available on the LondonAir and Defra UK-Air websites. The table also includes the London Mean dataset, produced by Kings College London and based on mean measurements across the London Air Quality Network.

Date	24 hr Mean North Kensington PM_{10} µg/m^3	24 hr Mean London Mean PM_{10} µg/m^3	60 minute Max North Kensington PM_{10} µg/m^3	60 minute Max London Mean PM_{10} µg/m^3
Mon 12/06/17	17	17	20	20
Tue 13/06/17	21	21	28	25
Wed 14/06/17	23	25	33	32
Thu 15/06/17	26	25	42	36
Fri 16/06/17	21	22	27	28
Sat 17/06/17	23	23	28	26
Sun 18/06/17	25	22	31	25
Mon 19/06/17	32	32	40	40
Tue 20/06/17	39	38	68	59
Wed 21/06/17	34	37	44	49
Thu 22/06/17	29	28	41	40
Fri 23/06/17	17	18	20	24

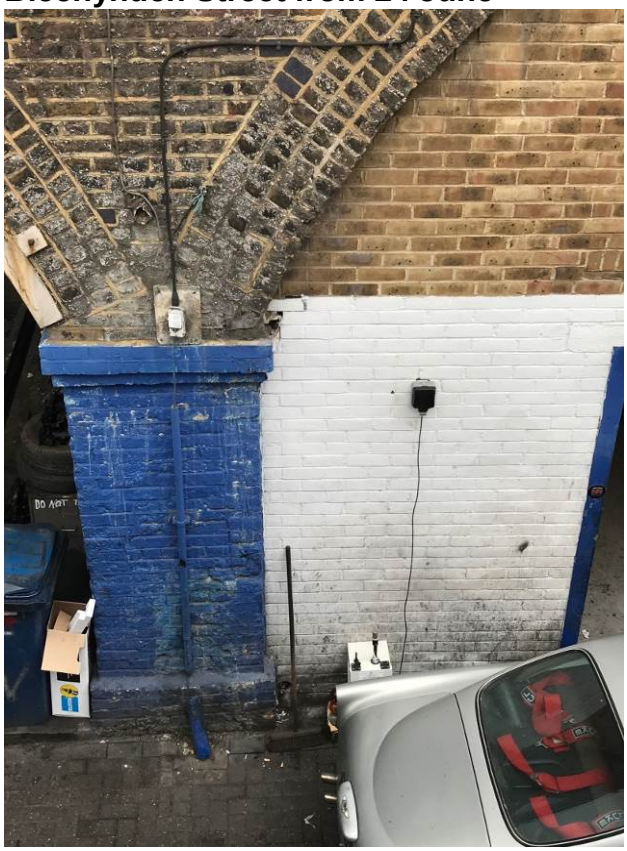
Appendix 2: Monitoring locations summary

The Kensington Academy site is located on the on the north eastern side roof of the Academy. This site monitors for particulates, PAH's and dioxins.

The Kensington Academy (D) is located on the south eastern edge of the roof of the building and monitors for asbestos.

Blechynden Street is located at ground level outside a garage, on the tower side of the raised railway line. This site monitors for particulates. Monitoring ceased here on 17 August when the equipment was moved to outside of the Latimer Road TMO office.

Blechynden Street from 24 June



Latimer Road TMO from 17 August

Grenfell Road is located on the roof of a contractor portable cabin approximately 2.5m high, which is comparable to the first residential floor of the nearby Brandon Road. This site monitors for particulates, dioxins, and PAH's.

Grenfell Road (B) was initially set against hoarding near to Treadgold Street housing and Brandon Road housing. However this area was inaccessible on 29 July so from this date the location was moved along the site boundary between Grenfell Road and the Leisure Centre.

Grenfell Road (B) from 30 June

Grenfell Road (B) from 29 July

Silchester Road (A) is located at ground level in front of the portable cabins. Kensington academy can be seen in the background. This site monitors for asbestos.

Grenfell Walk (C) was initially located on the western side of the raised Grenfell Walk. On 29 July and 3 August this location was inaccessible due to weather conditions so the monitoring location was moved to the ground area outside the Latimer Road TMO office.

Grenfell Walk (C) from 30 June

Latimer Road TMO from 29 July

Kensington Leisure centre is located on the main roof of the building, as close to the edge of the building as possible. This site monitors for particulates.