

Table A1 Summary statistics for hourly NO₂ concentrations in Ireland in 2020 for Zones A and B

	Wintetavern St.	Davit Road	DAA	St. Johns Road	Rathmines	Dun Laoghaire	Ballyfermot	Blanchardstown	Swords	Dublin Port	Pearse St.	Tallaght	Ringsend	South Link Road	UCC Distillery Fields
µg/m ³	Zone A													Zone B	
Annual mean ²	15	14	23	30	13	14	12	12	11	23	27	14	18	14	8
Median	9.7	9.7	20.1	26.7	9.2	9.9	7.8	6.7	7.4	19.5	21.6	7.4	13	9.7	5.3
% Data Capture	100	100	80	99	97	100	99	88	99	73	99	86	91	99	100
NO ₂ values >200	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Values >140 (UAT)	0	0	0	0	2	0	0	3	0	0	1	0	0	4	0
Values >100 (LAT)	5	2	0	27	3	0	1	16	0	2	28	1	2	15	0
Hourly max ³	121.5	108.3	88.8	130.1	170	92.1	107.7	164.6	83.7	117.3	142.3	100.8	123.8	407.2	72.6

¹ NO_x is expressed as µg/m³ NO₂.

² NO₂ annual mean limit value for the protection of human health: 40 µg/m³ applicable from 2010

³ NO₂ hourly limit value for the protection of human health: No more than 18 hrs > 200 µg/m³ applicable from 2010.

Table A2 Summary statistics for hourly NO₂ concentrations in Ireland in 2020 for Zones C and D

	Meath Navan	Waterford Brownes Road	Sligo	Limerick Peoples Park	Kilkenny Seville Lodge	Portlaoise	Dundalk	Emo Court	Birr	Castlebar	Carrick-on-shannon	Kilkitt
µg/m ⁴	Zone C							Zone D				
Annual mean ⁵	19	7	17	10	4	11	10	4	9	6	17	2
Median	14.9	4.6	13.4	6.7	2.9	5.5	6.9	2.3	5.7	3.6	11.1	1.5
% Data Capture	98	100	50	96	99	93	98	99	39	93	8	96
NO ₂ values >200	0	0	0	0	0	0	1	0	0	0	0	0
Values >140 (UAT)	0	0	0	0	0	0	6	0	0	0	0	0
Values >100 (LAT)	3	0	1	0	0	0	9	0	0	0	0	0
Hourly max ⁶	102.9	77.4	107.5	84.8	52.1	69.3	204	38	64	75.6	73.7	18.3

⁴ NO_x is expressed as µg/m³ NO₂.

⁵ NO₂ annual mean limit value for the protection of human health: 40 µg/m³ applicable from 2010

⁶ NO₂ hourly limit value for the protection of human health: No more than 18 hrs > 200 µg/m³ applicable from 2010.

Table A3 Summary statistics for hourly NO_x concentrations in Ireland in 2020 for Zones A and B

	W/netavern St.	Davitt Road	DAA	St. Johns Road	Rathmines	Dun Laoghaire	Ballyfermot	Blanchardstown	Swords	Dublin Port	Pearse St.	Tallaght	Ringsend	South Link Road	UCC Distillery Fields
µg/m ⁷	Zone A													Zone B	
Annual mean ⁸	25.8	27.5	37.5	82.0	21.4	21.7	17.1	62.4	15.5	58	78.7	27.3	32.4	33.2	12.0
Median	13.9	15.3	31.3	56	12.4	13.4	9.6	35.7	10.5	37.4	50.0	10.9	19.1	19.9	6.3
% Data Capture	100	100	80	100	97	100	99	88	99	73	99	87	99	99	100
Hourly max ⁹	883.0	800.9	327.4	1153.1	794.6	462	930.2	1405.4	504.8	641.6	1053.6	437.0	835.8	706.7	393.1

⁷ NO_x is expressed as µg/m³ NO₂.

⁸ NO₂ annual mean limit value for the protection of human health: 40 µg/m³ applicable from 2010

⁹ NO₂ hourly limit value for the protection of human health: No more than 18 hrs > 200 µg/m³ applicable from 2010.

Table A4 Summary statistics for hourly NO_x concentrations in Ireland in 2020 for Zones C and D

	Meath Navan	Waterford Brownes Road	Sligo	Limerick Peoples Park	Kilkenny Seville Lodge	Portlaoise	Dundalk	Emo Court	Birr	Castlebar	Carrick-on-shannon	Kilkitt
µg/m ¹⁰	Zone C							Zone D				
Annual mean ¹¹	52.0	10.6	37.6	15.7	6.2	11.5	17.8	4.7	23.2	8.9	40.1	2.5
Median	30.8	6.3	24.8	10.1	3.8	7.3	8.8	2.9	11.5	5.2	22.6	2.1
% Data Capture	98	100	50	96	99	95	98	100	39	93	8	96
Hourly max ¹²	1098.3	460.3	448.3	408.0	186.2	350.7	638.9	445.0	272.7	653.6	460.3	22.2

¹⁰ NO_x is expressed as µg/m³ NO₂.

¹¹ NO₂ annual mean limit value for the protection of human health: 40 µg/m³ applicable from 2010

¹² NO₂ hourly limit value for the protection of human health: No more than 18 hrs > 200 µg/m³ applicable from 2010.

Table A5 Summary statistics for hourly SO₂ concentrations in Ireland in 2020

	Winehaven Street	Rathmines	DAA	Tallaght	Dublin Port	Ringsend	South Link Road	Bishopstown (MTU)	Ennis	Dundalk	Portlaoise	Kilkitt	Letterkenny	Cork Harbour	Askeaton
(µg/m ³)	Zone A					Zone B		Zone C			Zone D				
Annual mean ¹³	5.2	1.4	3.8	2.4	2.1	3.4	3.9	4.4	2.0	1.6	1.4	11.8	1.8	1.6	
Median	1.8	1.2	2.9	1.1	1.8	2.7	1.6	2.5	1.6	1.2	1.3	8.4	1.2	1.5	
% data capture	100	98	80	72	100	100	27	100	100	96	98	98	100	100	
Hourly values > 350	0	0	0	0	0	0	0	0	0	0	0	2	0	0	
Hourly max ¹⁴	62.5	14.6	20.2	84.3	18.4	28.2	44.2	125.6	31.1	41.0	4.8	424.5	100.5	10.9	
Daily values > 125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Daily max	44.2	5.1	13.6	26.6	8.1	13.3	16	39.5	7.3	8.0	4.0	69.0	25.3	3.9	

¹³ SO₂ annual mean limit value for the protection of ecosystems: 20 µg/m³ applicable from 2001.

¹⁴ SO₂ hourly limit value for the protection of human health: No more than 24 hrs > 350 µg/m³ applicable from 2005.

Table A6 Summary statistics for rolling 8-hour CO concentrations in Ireland in 2020

	Winetavern Street	DAA	South Link Road	Portlaoise	Dundalk	Birr
(mg/m ³)	Zone A		Zone B	Zone C		Zone D
Annual mean	0.3	0.3	0.6	0.1	0.3	0.4
Median	0.3	0.2	0.5	0.1	0.2	0.4
% data capture	100	37	100	85	36	4.2
Values > 10	0	0	0	0	0	0
Max ¹⁵	3.6	3.7	2.7	1.2	1.1	1.2

¹⁵ CO maximum daily 8-hr mean limit value for the protection of human health: 10 mg/m³.

Table A8 AOT40 values from rural stations (Zone D) in Ireland, 2013 – 2020

($\mu\text{g}/\text{m}^3$).h ¹⁶	Kil Kitt Co. Monaghan	Mace Head Co. Galway	Castlebar Co. Mayo	Valentia Co. Kerry	Emo Court Co. Laois
2013	1482	5064	1366	4436	1017
2014	1316	4091	597	1583	785
2015	747	2521	693	3460	276
2016	5227	7622	2792	4116	1372
2017	3104	5070	1312	1699	4326
2018	7304	13020	5364	4967	3261
2019	4730	13694		533	3145
2020	4750	5818	2753	3318	3219
Average	3583	7113	2125	3014	2175

¹⁶ AOT40 target value for 2010 is 18,000 $\mu\text{g}/\text{m}^3$.h; long-term objective for 2020 is 6,000 $\mu\text{g}/\text{m}^3$.h. AOT40 is calculated 1 May – 31 July.

Table A9 Summary statistics for daily PM₁₀ concentrations in Zones A and B in Ireland in 2020

	Winetavern St	Rathmines	Phoenix Park	Blanchardstown	Dun Laoghaire	Ballyfermot	Tallaght	Ringend	St. John's Road	St. Anne's Park	Dublin Airport	Davitt Road	Dublin Port	Finglas	Marino	South Link Road	Heatherton Park	Bishopstown MTU
$\mu\text{g}/\text{m}^3$	Zone A															Zone B		
Annual mean ¹⁷	13	11	10	15	12	12	10	17	13	11	13	15	20	12	13	15	11	14
Median	11	9	9	13	10	10	9	14	11	9	12	13	17	10	11	13	9	13
% data capture	90	97	81	94	100	100	96	91	100	100	31	100	73	100	100	92	99	95
Values > 50 ¹⁸	0	2	0	2	0	2	0	8	0	0	0	4	7	0	0	2	2	0
Daily Max	49	73	41	62	46	63	41	67	47	40	36	113	77	44	48	67	71	44

¹⁷ PM₁₀ annual mean limit value for the protection of human health: 40 $\mu\text{g}/\text{m}^3$ applicable from 2005.

¹⁸ PM₁₀ daily limit for the protection of human health: No more than 35 days >50 $\mu\text{g}/\text{m}^3$ applicable from 2005.

Table A10 Summary statistics for daily PM₁₀ concentrations in Zone C in Ireland in 2020

	Portlaoise	Ennis	Sligo	Galway Rahoon	Clonmel	Dundalk	Carlow Town	Waterford Browness Road	Navan	Kilkenny Seville Lodge	Letterkenny	Wexford Town	Limerick People's Park	Athlone	Tralee
$\mu\text{g}/\text{m}^3$	Zone C														
Annual mean ¹⁹	12	20	16	13	12	13	11	14	14	19	15	12	13	16	16
Median	10	16	13	12	9	11	10	12	12	17	12	11	12	13	14
% data capture	94	100	25	100	94	94	99	100	90	98	99	52	94	85	92
Values > 50 ²⁰	0	19	2	1	1	2	1	3	0	1	9	0	1	3	7
Daily Max	46	129	72	62	54	65	51	67	48	56	93	40	70	106	90

¹⁹ PM₁₀ annual mean limit value for the protection of human health: 40 $\mu\text{g}/\text{m}^3$ applicable from 2005.

²⁰ PM₁₀ daily limit for the protection of human health: No more than 35 days >50 $\mu\text{g}/\text{m}^3$ applicable from 2005.

Table A11 Summary statistics for daily PM₁₀ concentrations in Zone D in Ireland in 2020

	Tipperary Town	Carrick-on-shannon	Enniscorthy	Birr	Askeaton	Macroom	Castlebar	Cobh	Clarenorris	Kilkitt	Cavan	Roscommon Town
$\mu\text{g}/\text{m}^3$	Zone D											
Annual mean ²¹	12	10	15	10	7	15	14	13	10	8	9	11
Median	10	9	13	10	7	13	13	12	9	6	8	10
% data capture	100	8	100	38	25	100	96	100	85	94	50	100
Values > 50 ²²	1	0	4	0	0	5	2	0	0	0	0	0
Daily Max	71	18	102	28	18	67	70	44	30	34	34	42

²¹ PM₁₀ annual mean limit value for the protection of human health: 40 $\mu\text{g}/\text{m}^3$ applicable from 2005.

Table A12 Summary statistics for daily PM_{2.5} concentrations in Zones A and B in Ireland in 2020

	Rathmines	Phoenix Park	Blanchardstown	Dun Laoghaire	Ballyfermot	Tallaght	Ringsend	Pearse Street	St. John's Road	St. Anne's Park	Dublin Airport	Davitt Road	Dublin Port	Finglas	Marino	Heatherton Park	UCC Distillery Fields
$\mu\text{g}/\text{m}^3$	Zone A															Zone B	
Annual mean ²³	8	7	7	8	8	7	8	8	7	7	6	9	9	7	8	8	7
Median	5	5	6	6	6	5	6	6	6	5	5	6	7	6	7	6	5
% data capture	97	81	62	100	100	85	99	89	100	100	37	100	73	100	100	99	88
Days > WHO 24hr AQ Guideline	7	1	2	8	6	2	6	6	4	2	0	11	7	3	7	8	9
Daily Max	67	35	28	40	58	34	67	44	43	34	20	59	69	36	39	69	55

²³ PM_{2.5} annual mean limit value for the protection of human health: 25 $\mu\text{g}/\text{m}^3$ applicable from 2010.

Table A13 Summary statistics for daily PM_{2.5} concentrations in Zone C in Ireland in 2020

	Portlaoise	Ennis	Bray	Sligo	Clonmel	Carlow Town	Waterford Browne's Road	Navan	Letterkenny	Wexford Town	Limerick People's Park	Athlone	Tralee
$\mu\text{g}/\text{m}^3$	Zone C												
Annual mean ²⁴	8	14	5	12	8	7	10	8	11	8	9	12	12
Median	7	11	4	8	6	6	8	7	9	7	7	10	9
% data capture	94	99	96	23	93	99	100	98	99	59	96	93	100
Days > WHO 24hr AQ Guideline	11	42	0	9	8	5	13	9	23	5	8	24	30
Daily Max	40	124	25	69	46	47	63	55	90	35	65	97	83

²⁴ PM_{2.5} annual mean limit value for the protection of human health: 25 $\mu\text{g}/\text{m}^3$ applicable from 2010.

Table A14 Summary statistics for daily PM_{2.5} concentrations in Zone D in Ireland in 2020

	Tipperary Town	Carrick-on-shannon	Mallow	Eniscorthy	Birr	Askeaton	Macroom	Longford	Cobh	Claremorris	Cavan	Roscommon Town
$\mu\text{g}/\text{m}^3$	Zone D											
Annual mean ²⁵	8	7	10	12	6	4	11	9	8	5	6	7
Median	6	7	8	10	5	4	9	7	7	4	5	6
% data capture	100	8	4	75	38	25	100	59	100	91	50	100
Days > WHO 24hr AQ Guideline	9	0	0	18	0	0	26	6	6	0	2	3
Daily Max	65	17	16	98	22	16	63	74	39	25	30	37

²⁵ PM_{2.5} annual mean limit value for the protection of human health: 25 $\mu\text{g}/\text{m}^3$ applicable from 2010.

Table A15 Summary statistics for chemical composition of PM_{2.5} in 2020

Chemical Species	Claremorris, Co. Mayo
Annual Mean (ug/m ³) ²⁶	Zone D
Elemental Carbon (Transmittance Correction) ²⁷	0.19
Organic Carbon (Transmittance Correction)	1.62
Total Carbon	1.82
Chloride (Cl ⁻)	0.32
Nitrate (NO ₃ ⁻)	0.24
Sulphate (SO ₄ ²⁻)	0.41
Ammonium (NH ₄ ⁺)	0.13
Calcium (Ca ⁺)	0.23
Magnesium (Mg ²⁺)	0.09
Potassium (K ⁺)	0.16
Sodium (Na ⁺)	0.13
% data capture	100

²⁶ There are no limit values for chemical composition of PM_{2.5}.

Table A16 Summary statistics for daily ozone precursor VOCs concentrations at Rathmines in 2020

	Benzene	Toluene	Ethylbenzene	m- and p-Xylene	o-Xylene
($\mu\text{g}/\text{m}^3$)	Zone A				
Annual mean ²⁸	0.52	0.82	0.14	0.57	0.09
Median	0.19	0.43	0.01	0.02	0.03
% data capture	100	100	100	100	100
Hourly max	6.23	7.49	1.64	10.87	1.21

²⁸ No limit values for toluene, ethylbenzene, m-and-p-xylene and o-xylene.

Table A17 Summary statistics for daily ozone precursor VOCs concentrations at Kilkenny in 2020

	Benzene	Toluene	Ethylbenzene	m- and p-Xylene	o-Xylene
($\mu\text{g}/\text{m}^3$)	Zone C				
Annual mean ²⁹	0.04	0.07	0.06	0.09	0.10
Median	0.00	-0.03	0.09	0.00	0.04
% data capture	89	89	89	89	89
Hourly max	0.95	2.51	1.16	4.83	2.42

²⁹ No limit values for toluene, ethylbenzene, m-and-p-xylene and o-xylene.

Table A18 Summary statistics for monthly lead, arsenic, cadmium and nickel concentrations in Ireland in 2020

	Rathmines				Heatherton Park				Galway Rahoon Road				Castlebar				Kilkitt			
	Zone A				Zone B				Zone C				Zone D							
(ng/m ³)	Pb	As	Cd	Ni	Pb	As	Cd	Ni	Pb	As	Cd	Ni	Pb	As	Cd	Ni	Pb	As	Cd	Ni
Annual mean ³⁰	3.8	0.9	0.1	0.6	0.8	0.5	0.1	0.0	0.0	0.4	0.0	2.7	3.6	0.3	0.3	0.6	14.1	0.1	1.3	0.8
Median	0.7	0.7	0.0	0.6	9.1	0.0	0.3	1.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.3	1.1	0.0	0.0	0.6
% data capture	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Monthly average max	11.9	2.2	0.8	1.7	21.0	0.7	2.8	6.1	0.0	1.0	0.0	30.0	1.7	0.6	1.7	8.5	7.4	0.9	2.3	5.1

³⁰ Annual mean limit value for lead is 500 ng/m³. Target values for remaining heavy metals are applicable from 2013: arsenic 6ng/m³, cadmium 5ng/m³, nickel 20ng/m³.

Table A19 Summary statistics for monthly mercury concentrations in 2020

	Mace Head
(ng/m ³)	Zone D
Annual mean ³¹	1.32
Median	1.31
% data capture	91
Monthly average max	1.45

³¹ No limit values for mercury.

Table A20 Summary statistics for monthly metal deposition concentrations in 2020

Metal ³²	Rosemount, UCD	Valentia, Co. Kerry
Annual Mean ($\mu\text{g}/\text{m}^2/\text{day}$) ³³	Zone A	Zone D
Arsenic *	0.06	10.25
Cadmium *	0.01	0.03
Nickel *	0.23	0.45
Lead *	0.11	0.33
Mercury *	0.00	0.01
Aluminium	8.04	10.80
Chromium	0.67	0.30
Cobalt	0.07	0.20
Copper	3.14	33.46
Manganese	0.97	1.19
Antimony	0.07	0.16
Thallium	0.04	0.09
Vanadium	0.26	0.52
Zinc	5.82	59.76
Barium	0.78	0.83
Uranium	0.44	0.73
% data capture	33	100

³² The metals marked * require monitoring under the legislation. The remainder are reported for information purposes.

³³ There are no limit values for metal deposition.

Table A21 Summary statistics for monthly PAH concentrations in 2020

Polycyclic Aromatic Hydrocarbon	Rathmines	Heatherton Park	Galway Ragoon Road	Kilkitt	Castlebar
Annual Mean (ng/m ³)	Zone A	Zone B	Zone C	Zone D	Zone D
Benzo[a]Pyrene ³⁴	0.16	0.31	0.31	0.04	0.26
% data capture	100	100	100	100	100

Table A22 Summary statistics for monthly PAH deposition concentrations in 2020

Polycyclic Aromatic Hydrocarbon	Rosemount, UCD
Annual Mean (ng/m ² /day) ³⁵	Zone A
Benzo(a)Pyrene	2.7
% data capture	42

³⁴ Annual mean limit value for benzo(a)pyrene is 1ng/m³. There are no limit values for any other PAH.

³⁵ There are no limit values for metal deposition.