Supporting Information for Investigating Diesel Engines as an Atmospheric Source of Isocyanic Acid in Urban Areas

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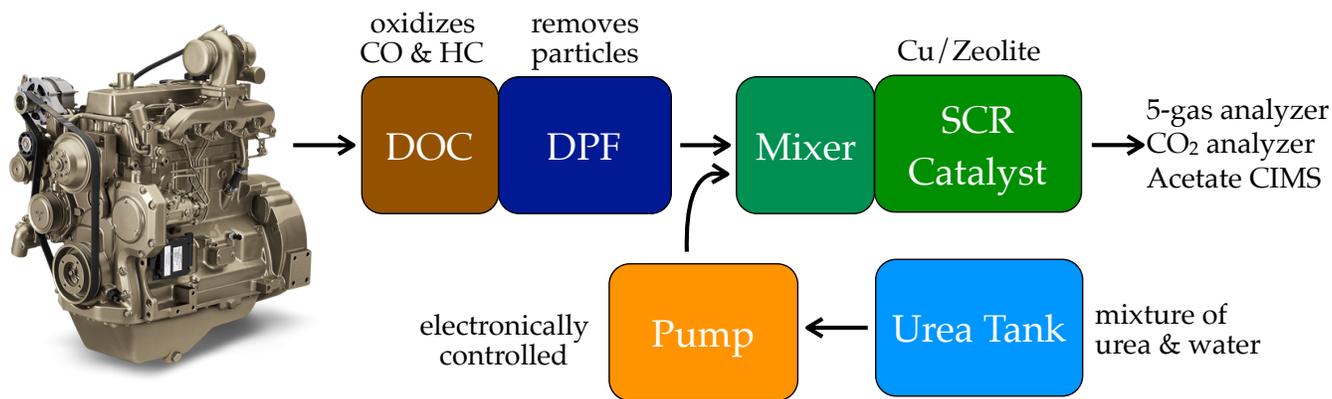
Figure S-1: Schematic showing the diesel engine, selective catalytic reduction (SCR) system, and instrumentation used during the study.

Table S-1: HNCO and CO emission factors and HNCO:CO ratios used to determine lower and upper bound for the ratios

Reference/Engine	Engine Mode/Drive Cycle	HNCO (mg kg-fuel^{-1})	CO (g kg-fuel^{-1})	HNCO/CO
This work: John Deere 4.5L Tier-3/Tier-4	1500 rpm @ 45 kW	38.80	4.61	8.41E-03
	2400 rpm @ 11 kW	56.20	48.91	1.15E-03
	2400 rpm @ 57 kW	30.90	3.74	8.26E-03
	1500 rpm @ 45 kW	9.40	2.19	4.29E-03
	2400 rpm @ 57 kW	7.60	3.40	2.24E-03
Link et al. (2016): John Deere 4.5L Tier-3	900 rpm @ 0 kW	54.00	49.00	1.10E-03
	2400 rpm @ 60 kW	17.00	3.95	4.30E-03
	900 rpm @ 0 kW	51.00	54.00	9.44E-04
	2400 rpm @ 60 kW	17.00	3.65	4.66E-03
Wentzell et al. (2013): VW	US06	3.98	0.92	4.33E-03

Jetta 2001 + DOC	HWFET	3.54	1.01	3.50E-03
	FTP75	0.21	11.60	1.77E-05
	Idle	0.61	7.09	8.62E-05
Heeb et al. (2011, 2012): IVECO 3L Euro-3 engine	ISO8178 – Mode 7	4.58	5.19	8.82E-04
	ISO8178 – Mode 4	7.50	15.86	4.73E-04
	ISO8178 – Mode 3	2.38	2.01	1.18E-03
Heeb et al. (2011, 2012): IVECO 3L Euro-3 engine (SCR)	ISO8178 – Mode 7	12.50	4.10	3.05E-03
	ISO8178 – Mode 4	32.41	19.03	1.70E-03
	ISO8178 – Mode 3	41.26	2.60	1.59E-02
Heeb et al. (2011, 2012): IVECO 3L Euro-3 engine (DPF+SCR)	ISO8178 – Mode 7	1.64	BDL	NA
	ISO8178 – Mode 4	45.17	3.40	1.33E-02
	ISO8178 – Mode 3	74.88	BDL	NA

BDL = below detection limit, NA = not applicable

(a) HNCO precursor (low) (pptv) (b) HNCO precursor (high) (pptv)
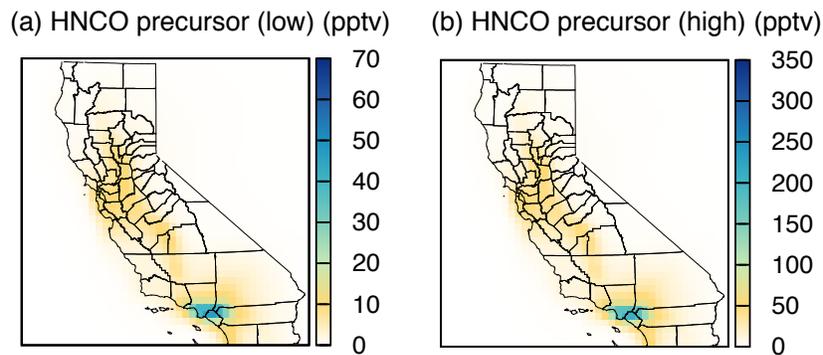
Figure S-2: (a) Low and (b) high estimates of the 14-day averaged ground-level concentrations of HNCO precursors from
5   the 24 km simulations.