Appendix G

Noise Data

Table 1. Horn Noise Levels (Existing and Proposed Action)

Receiver Name	Land Use Category	Distance (ft)	Existing Ambient Level (Ldn [Measured])	Project Noise Level (Ldn)	Combined Level (Ldn)	Increase over Existing (dB)	Moderate Impact Threshold	Severe Impact Threshold	Impact?	Moderate Contour Distance (ft)	Severe Contour Distance (ft)
Loc 1	2 - Nighttime Use	47	80.7	68.4	80.9	0.2	66 Ldn	75 Ldn	Moderate	68	17
Loc 2	2 - Nighttime Use	44	79.8	68.8	80.1	0.3	66 Ldn	75 Ldn	Moderate	68	17
Loc 3	2 - Nighttime Use	44	77.2	68.8	77.8	0.6	66 Ldn	74 Ldn	Moderate	68	20
Loc 4	2 - Nighttime Use	110	71.8	62.8	72.3	0.5	66 Ldn	71 Ldn	None	67	31
Loc 5	2 - Nighttime Use	131	70.3	61.7	70.9	0.6	65 Ldn	69 Ldn	None	79	43
Loc 6	2 - Nighttime Use	45	71	68.7	73	2	66 Ldn	70 Ldn	Moderate	68	37
Loc 8	2 - Nighttime Use	177	67.7	59.7	68.3	0.6	63 Ldn	68 Ldn	None	107	50
Loc 9	2 - Nighttime Use	184	67.5	59.5	68.1	0.6	63 Ldn	68 Ldn	None	108	50
Loc 10	2 - Nighttime Use	259	69.7	57.3	69.9	0.2	65 Ldn	69 Ldn	None	79	43
Loc 11	2 - Nighttime Use	188	67.3	59.4	67.9	0.6	63 Ldn	67 Ldn	None	108	59
Loc 12	2 - Nighttime Use	26	70.8	72.2	74.6	3.8	66 Ldn	70 Ldn	Severe	67	36
Loc 13	2 - Nighttime Use	84	68.3	64.6	69.8	1.5	63 Ldn	68 Ldn	Moderate	107	50
Loc 14	2 - Nighttime Use	65	71.5	66.3	72.6	1.1	66 Ldn	71 Ldn	Moderate	68	32
Loc 15	2 - Nighttime Use	90	69.3	64.1	70.5	1.2	64 Ldn	69 Ldn	Moderate	91	42
Loc 16	2 - Nighttime Use	230	72	58	72.2	0.2	66 Ldn	71 Ldn	None	67	31
Loc 18	2 - Nighttime Use	93	69	63.9	70.2	1.2	64 Ldn	69 Ldn	None	92	43
Loc 19	2 - Nighttime Use	104	70.3	63.2	71.1	0.8	65 Ldn	69 Ldn	None	79	43
Loc 20	2 - Nighttime Use	297	62.3	56.4	63.3	1	59 Ldn	64 Ldn	None	199	92

Table 2. Wayside Noise Levels (Existing and Proposed Action)

Receiver Name	Land Use Category	Distance (ft)	Existing Ambient Level (Ldn [Measured])	Project Noise Level (Ldn)	Combined Level (Ldn)	Increase over Existing (dB)	Moderate Impact Threshold (Ldn)	Severe Impact Threshold (Ldn)	Impact?	Moderate Contour Distance (ft)	Severe Contour Distance (ft)
Loc 1	2 - Nighttime Use	47	80.7	59.9	80.7	0	66	75	None	18	< 10
Loc 2	2 - Nighttime Use	44	79.8	60.4	79.8	0	66	75	None	19	< 10
Loc 3	2 - Nighttime Use	44	77.2	60.4	77.3	0.1	66	74	None	19	< 10
Loc 4	2 - Nighttime Use	110	71.8	54.4	71.9	0.1	66	71	None	19	< 10
Loc 5	2 - Nighttime Use	131	70.3	53.2	70.4	0.1	65	69	None	21	12
Loc 6	2 - Nighttime Use	45	71	60.2	71.3	0.3	66	70	None	18	< 10
Loc 8	2 - Nighttime Use	177	67.7	51.3	67.8	0.1	63	68	None	29	14
Loc 9	2 - Nighttime Use	184	67.5	51	67.6	0.1	63	68	None	29	14
Loc 10	2 - Nighttime Use	259	69.7	48.8	69.7	0	65	69	None	22	12
Loc 11	2 - Nighttime Use	188	67.3	50.9	67.4	0.1	63	67	None	29	16
Loc 12	2 - Nighttime Use	26	70.8	63.8	71.6	0.8	66	70	None	19	10
Loc 13	2 - Nighttime Use	84	68.3	56.1	68.6	0.3	63	68	None	29	14
Loc 14	2 - Nighttime Use	65	71.5	57.8	71.7	0.2	66	71	None	18	< 10
Loc 15	2 - Nighttime Use	90	69.3	55.7	69.5	0.2	64	69	None	25	12
Loc 16	2 - Nighttime Use	230	72	49.6	72	0	66	71	None	19	< 10
Loc 18	2 - Nighttime Use	93	69	55.5	69.2	0.2	64	69	None	25	12
Loc 19	2 - Nighttime Use	104	70.3	54.8	70.4	0.1	65	69	None	22	12
Loc 20	2 - Nighttime Use	297	62.3	47.9	62.5	0.2	59	64	None	54	25

Table 3. Cumulative Horn Noise Levels (Existing and Proposed Action)

Receiver Name	Land Use Category	Distance (ft)	Existing Ambient Level (Ldn [Measured])	Project Noise Level (Ldn)	Combined Level (Ldn)	Increase over Existing (dB)	Moderate Impact Threshold (Ldn)	Severe Impact Threshold (Ldn)	Impact?	Moderate Contour Distance (ft)	Severe Contour Distance (ft)
Loc 1	2 - Nighttime Use	47	80.7	73.7	81.5	0.8	66	75	Moderate	153	38
Loc 2	2 - Nighttime Use	44	79.8	74.1	80.8	1	66	75	Moderate	153	38
Loc 3	2 - Nighttime Use	44	77.2	74.1	78.9	1.7	66	74	Severe	153	45
Loc 4	2 - Nighttime Use	110	71.8	68.2	73.4	1.6	66	71	Moderate	154	72
Loc 5	2 - Nighttime Use	131	70.3	67	72	1.7	65	69	Moderate	178	96
Loc 6	2 - Nighttime Use	45	71	74	75.8	4.8	66	70	Severe	154	83
Loc 8	2 - Nighttime Use	177	67.7	65.1	69.6	1.9	63	68	Moderate	244	113
Loc 9	2 - Nighttime Use	184	67.5	64.8	69.4	1.9	63	68	Moderate	243	113
Loc 10	2 - Nighttime Use	259	69.7	62.6	70.5	0.8	65	69	None	179	97
Loc 11	2 - Nighttime Use	188	67.3	64.7	69.2	1.9	63	67	Moderate	244	132
Loc 12	2 - Nighttime Use	26	70.8	77.6	78.4	7.6	66	70	Severe	154	83
Loc 13	2 - Nighttime Use	84	68.3	69.9	72.2	3.9	63	68	Severe	242	112
Loc 14	2 - Nighttime Use	65	71.5	71.6	74.6	3.1	66	71	Severe	154	71
Loc 15	2 - Nighttime Use	90	69.3	69.5	72.4	3.1	64	69	Severe	209	97
Loc 16	2 - Nighttime Use	230	72	63.4	72.6	0.6	66	71	None	154	72
Loc 18	2 - Nighttime Use	93	69	69.3	72.1	3.1	64	69	Severe	210	97
Loc 19	2 - Nighttime Use	104	70.3	68.5	72.5	2.2	65	69	Moderate	178	96
Loc 20	2 - Nighttime Use	297	62.3	61.7	65	2.7	59	64	Moderate	450	209

Table 4. Cumulative Wayside Noise Levels (Existing and Proposed Action)

Receiver Name	Land Use Category	Distance (ft)	Existing Ambient Level (Ldn [Measured])	Project Noise Level (Ldn)	Combined Level (Ldn)	Increase over Existing (dB)	Moderate Impact Threshold (Ldn)	Severe Impact Threshold (Ldn)	Impact?	Moderate Contour Distance (ft)	Severe Contour Distance (ft)
Loc 1	2 - Nighttime Use	47	80.7	65.2	80.8	1	66	75	None	42	10
Loc 2	2 - Nighttime Use	44	79.8	65.7	80	0	66	75	None	42	11
Loc 3	2 - Nighttime Use	44	77.2	65.7	77.5	0	66	74	None	42	12
Loc 4	2 - Nighttime Use	110	71.8	59.7	72.1	0	66	71	None	42	19
Loc 5	2 - Nighttime Use	131	70.3	58.6	70.6	0	65	69	None	49	27
Loc 6	2 - Nighttime Use	45	71	65.5	72.1	1	66	70	None	42	23
Loc 8	2 - Nighttime Use	177	67.7	56.6	68	0	63	68	None	66	31
Loc 9	2 - Nighttime Use	184	67.5	56.3	67.8	0	63	68	None	66	31
Loc 10	2 - Nighttime Use	259	69.7	54.1	69.8	0	65	69	None	49	26
Loc 11	2 - Nighttime Use	188	67.3	56.2	67.6	0	63	67	None	66	36
Loc 12	2 - Nighttime Use	26	70.8	69.1	73	2	66	70	Moderate	42	23
Loc 13	2 - Nighttime Use	84	68.3	61.5	69.1	1	63	68	None	67	31
Loc 14	2 - Nighttime Use	65	71.5	63.1	72.1	1	66	71	None	42	19
Loc 15	2 - Nighttime Use	90	69.3	61	69.9	1	64	69	None	57	26
Loc 16	2 - Nighttime Use	230	72	54.9	72.1	0	66	71	None	42	19
Loc 18	2 - Nighttime Use	93	69	60.8	69.6	1	64	69	None	57	26
Loc 19	2 - Nighttime Use	104	70.3	60.1	70.7	0	65	69	None	49	27
Loc 20	2 - Nighttime Use	297	62.3	53.2	62.8	1	59	64	None	122	57

Table 5. Proposed Action Noise Impacts

Grade Crossing	Type	Segment	Description	Moderate Impacts, Horn	Severe Impacts, Horn
1	Public	A	B St	4	
2	Public	A	N Tower Ave	2	
3	Public	A	N Pearl St	2	
4	Public	A	E St	4	
5	Public	A	F St	4	
6	Public	A	G St	4	
7	Public	A	H St	7	
8	Public	A	J St	10	
9	Public	B	Foron Rd		
10	Public	B	Kuper Rd		
11	Public	B	Robert Thompson Rd	1	
12	Public	B	Hoss Rd		
13	Public	B	222nd Ave SW		
14	Private	B	Private Drive		
15	Private	B	Private Drive		
16	Public	B	216th Ave SW		1
17	Private	B	Private drive		
18	Public	B	Old Highway 99 SW	3	
19	Public	B	Crossway St SW		
20	Public	B	Tea St SW		
21	Public	C	Joselyn St SW		
22	Private	C	Private drive		
23	Public	C	183rd Ave SW	1	
24	Public	C	Littlerock Rd SW	1	
25	Private	D	Private drive		
26	Private	D	Private drive		
27	Public	D	Gate Rd SW		
28	Public	D	Hunter Loop Rd SW	1	
29	Private	D	Private drive	1	
30	Private	D	Private drive		
31	Private	E	Private drive		
32	Public	E	Blockhouse Rd		
33	Public	E	Merry Rd		
34	Public	E	Murrey St		
35	Public	E	Newton St	1	
36	Public	E	Shelton Rd		
37	Private	E	Private drive		
38	Public	E	Elma Gate Rd W		
39	Private	E	Private drive	2	
40	Private	E	Private drive		
41	Private	E	Private drive		
42	Private	E	Private drive		
43	Public	F	Porter Creek Rd W		

Grade Crossing	Type	Segment	Description	Moderate Impacts, Horn	Severe Impacts, Horn
44	Private	F	Private drive		
45	Private	F	Private drive	6	
46	Private	F	Private drive	4	
47	Public	F	Dunlap Rd		2
48	Private	F	Private drive		
49	Private	F	Private drive		
50	Private	F	Private drive	2	
51	Public	F	N Blockhouse Rd		
52	Public	F	Unnamed Road		
53	Public	F	N Blockhouse Rd		
54	Public	F	Twidwell Rd		
55	Public	G	N 2nd St	16	2
56	Public	G	N 3rd St	2	
57	Public	G	N 5th St	2	
58	Public	G	N 6th St	4	4
59	Public	G	N 9th St	6	
60	Public	G	N 10th St	6	
61	Public	G	N 11th St	10	8
62	Public	G	N 13th St	6	8
63	Public	G	N 17th St	4	4
64	Public	G	Cider Rd		
65	Public	G	Hurd Rd	4	
66	Public	G	Newman Creek Rd	4	
67	Private	G	Private drive		
68	Public	G	ONeill Rd		
69	Private	G	Private Drive		
70	Public	G	Moore Rd		
71	Public	G	Hewitt St	2	
72	Public	G	Monte-Elma Rd		
73	Public	H	Old Monte Brady Rd	4	
74	Private	H	Private drive		
75	Public	H	Winkleman Rd N		
76	Public	H	Fairbairn Rd		
77	Private	H	Private parking lot		
78	Public	H	Glenn Rd N		
79	Public	H	Monte Brady Rd	2	
80	Public	H	Old Beacon Rd	4	
81	Private	H	Private drive	2	
82	Public	H	S Sylvia St		
83	Public	H	S Main St		
84	Public	H	S 1St St		
85	Public	I	County Farm Rd	12	
86	Public	I	Devonshire Rd		
87	Public	I	Heikkinen Rd		
88	Public	I	Alder Grove Rd		

Grade Crossing	Type	Segment	Description	Moderate Impacts, Horn	Severe Impacts, Horn
89	Private	I	Private drive	1	
90	Public	I	Central park Dr		
91	Private	I	Private drive	10	4
92	Private	I	Private drive		
93	Public	J	E Sargent Blvd	1	
94	Public	J	S Fleet St		
95	Public	J	S Tyler St		
96	Public	J	S Chehalis St		
97	Private	J	Private parking lot		
98	Private	J	Private drive		
99	Private	J	Private drive	2	
100	Public	J	W Wishkah St	4	
101	Public	J	W 1st St	2	
102	Public	J	N Maple St		
103	Public	J	Port Industrial Rd		
Total				**170**	**33**

Table 6. Cumulative Noise Impacts

Grade Crossing	Type	Segment	Description	Moderate Impacts, Horn	Severe Impacts, Horn	Moderate Impacts, Wayside	Severe Impacts, Wayside
1	Public	A	B St	20			
2	Public	A	N Tower Ave	12			
3	Public	A	N Pearl St	12			
4	Public	A	E St	16			
5	Public	A	F St	18			
6	Public	A	G St	14			
7	Public	A	H St	15			
8	Public	A	J St	36			
9	Public	B	Foron Rd	5			
10	Public	B	Kuper Rd				
11	Public	B	Robert Thompson Rd	6	1		
12	Public	B	Hoss Rd				
13	Public	B	222nd Ave SW	3			
14	Private	B	Private Drive	6	2		
15	Private	B	Private Drive	4	2		
16	Public	B	216th Ave SW	4	3	1	
17	Private	B	Private drive	7	2		
18	Public	B	Old Highway 99 SW	7	3		
19	Public	B	Crossway St SW	2	1		
20	Public	B	Tea St SW	3	1		
21	Public	C	Joselyn St SW	4			
22	Private	C	Private drive				
23	Public	C	183rd Ave SW	5	2	2	
24	Public	C	Littlerock Rd SW	9	2	1	
25	Private	D	Private drive	3	1		
26	Private	D	Private drive	7			
27	Public	D	Gate Rd SW	3	1		
28	Public	D	Hunter Loop Rd SW	4	1		
29	Private	D	Private drive	6	2		
30	Private	D	Private drive				
31	Private	E	Private drive				
32	Public	E	Blockhouse Rd				
33	Public	E	Merry Rd	1			
34	Public	E	Murrey St	7			
35	Public	E	Newton St	5	1		
36	Public	E	Shelton Rd	6			
37	Private	E	Private drive	4			
38	Public	E	Elma Gate Rd W				
39	Private	E	Private drive	4	2		
40	Private	E	Private drive	8			

Grade Crossing	Type	Segment	Description	Moderate Impacts, Horn	Severe Impacts, Horn	Moderate Impacts, Wayside	Severe Impacts, Wayside
41	Private	E	Private drive	4			
42	Private	E	Private drive	2			
43	Public	F	Porter Creek Rd W	6	4		
44	Private	F	Private drive	1			
45	Private	F	Private drive	18	6	4	
46	Private	F	Private drive	14	4	2	
47	Public	F	Dunlap Rd	4	4	2	
48	Private	F	Private drive	4			
49	Private	F	Private drive	6	4		
50	Private	F	Private drive	8	2		
51	Public	F	N Blockhouse Rd	4			
52	Public	F	Unnamed Road		2		
53	Public	F	N Blockhouse Rd	16			
54	Public	F	Twidwell Rd				
55	Public	G	N 2nd St	30	32	8	
56	Public	G	N 3rd St	12	2		
57	Public	G	N 5th St	20	6	2	
58	Public	G	N 6th St	18	14	6	
59	Public	G	N 9th St	10	6		
60	Public	G	N 10th St	12	8	2	
61	Public	G	N 11th St	14	24	4	4
62	Public	G	N 13th St	24	20	6	4
63	Public	G	N 17th St	20	10	4	2
64	Public	G	Cider Rd	20	2		
65	Public	G	Hurd Rd	20	10		
66	Public	G	Newman Creek Rd	6	4		
67	Private	G	Private drive	12	2		
68	Public	G	ONeill Rd	2			
69	Private	G	Private Drive	10			
70	Public	G	Moore Rd	2	2		
71	Public	G	Hewitt St	14	4		
72	Public	G	Monte-Elma Rd	22	2		
73	Public	H	Old Monte Brady Rd	14	6		
74	Private	H	Private drive	2			
75	Public	H	Winkleman Rd N				
76	Public	H	Fairbairn Rd	6			
77	Private	H	Private parking lot				
78	Public	H	Glenn Rd N	4	2		
79	Public	H	Monte Brady Rd	6	2		
80	Public	H	Old Beacon Rd	8	4		
81	Private	H	Private drive	2	2		

Grade Crossing	Type	Segment	Description	Moderate Impacts, Horn	Severe Impacts, Horn	Moderate Impacts, Wayside	Severe Impacts, Wayside
82	Public	H	S Sylvia St				
83	Public	H	S Main St				
84	Public	H	S 1St St	2			
85	Public	I	County Farm Rd	2	12	2	
86	Public	I	Devonshire Rd	6			
87	Public	I	Heikkinen Rd	2			
88	Public	I	Alder Grove Rd	6			
89	Private	I	Private drive	2	1		
90	Public	I	Central park Dr	7		4	
91	Private	I	Private drive	8	14	24	
92	Private	I	Private drive	12		4	
93	Public	J	E Sargent Blvd		1		
94	Public	J	S Fleet St				
95	Public	J	S Tyler St				
96	Public	J	S Chehalis St				
97	Private	J	Private parking lot				
98	Private	J	Private drive	4			
99	Private	J	Private drive	10	2		
100	Public	J	W Wishkah St	12	4		
101	Public	J	W 1st St	20	2		
102	Public	J	N Maple St				
103	Public	J	Port Industrial Rd				
Total				**756**	**253**	**78**	**10**

WILSON IHRIG
ACOUSTICS, NOISE & VIBRATION
CALIFORNIA
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WESTWAY-IMPERIUM EXPANSION PROJECT

GRAYS HARBOR

HOQUIAM, WASHINGTON

PUGET SOUND AND PACIFIC RAIL CORRIDOR

LONG TERM AMBIENT NOISE SURVEY

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INTRODUCTION

The purpose of this report is to document the execution and results of a long term noise survey performed in the Puget Sound and Pacific (PSAP) rail corridor between Centralia, WA and Aberdeen, WA over the course of three weeks from March 28 through April 16 2015. A full six days of data were collected at eighteen locations. Descriptions of the noise monitoring locations, equipment and procedures are provided. A summary of the acquired data and a complete set of daily plots of hourly statistical noise levels are included.

NOISE MONITORING LOCATIONS

Noise monitoring locations were selected with consideration of 1) proximity of residences to PSAP grade crossings, 2) density of residential areas and 3) accessibility of structures on which to install noise monitors (utility poles or trees) while avoiding private property. Permits to mount equipment to utility poles were obtained from Centralia City Light and Grays Harbor Public Utility District.

Satellite views of the PSAP corridor with the monitoring locations are shown in Figure 1, Figure 2, and Figure 3. A summary of primary noise sources observed at each location is included in Table 1 below. Measurements were not made at previously selected Location 7 in Rochester and Location 17 in Aberdeen since permission to use those utility poles was denied and representative alternatives could not be identified.

Table 1 Summary of existing noise sources

Loc	Approx. Address	Observed noise sources (in addition to trains)
1	1023 B St, Centralia	Infrequent local traffic
2	1102 G St, Centralia	Infrequent local traffic
3	1103 J St, Centralia	Infrequent local traffic
4	3900 Kuper Rd, Centralia	Cars and heavy trucks on Kuper Road
5	Old Hwy 9 & Tea St SW, Rochester	Old Hwy 9 traffic (mostly cars)
6	19318 Grand Mound Way, Rochester	Hwy 12 traffic (cars and trucks), infrequent local traffic
8	180th @ Little Rock, Rochester	Local traffic
9	205 Murrey, Oakville	Infrequent local traffic, Hwy 12 traffic
10	22 Evergreen Village Ln, Elma	Hwy 12 traffic (cars and trucks)
11	513 N 13th ST, Elma	Infrequent local traffic, light industrial
12	502 N 13th ST, Elma	Infrequent local traffic
13	57 Hurd Rd, Elma	Infrequent local traffic
14	510 Foss Ave, Satsop	Infrequent local traffic
15	78 Devonshire, Montesano	Infrequent local traffic
16	140 S Chehalis St, Aberdeen	Hwy 12 traffic (cars and trucks)
18	2100 1st St, Aberdeen	Local traffic, light industrial
19	11846 170th Ave, Rochester	Infrequent local traffic
20	7220 Central Park Dr, Aberdeen	Local traffic

NOISE MONITORING EQUIPMENT

A total of nine Type I noise monitor setups were used in the survey and included Larson Davis (L-D) Model 700, 812 or 820 digital logging sound level meters. A list of the equipment included in each setup is provided in Table 2. Each noise monitor setup was contained in a weatherproof security box with a sealed lead-acid battery and desiccant. The microphones with preamplifiers were inserted at the end of an attached "gooseneck" containing the microphone cable, and protected by waterproofed windscreens.

Table 2 Noise monitoring equipment

Noise Monitor Setup	Digital Logging Sound Level Meter	Microphone Preamplifier	Microphone
A	L-D Model 812 S/N 0435	L-D Model PRM828 S/N 1666	L-D Model 2541 S/N 4402
B	L-D Model 812 S/N 0439	L-D Model PRM828 S/N 1556	G.R.A.S. 40AE S/N 31776
C	L-D Model 812 S/N 0576	L-D Model PRM828 S/N 1396	L-D Model 2541 S/N 5704
D	L-D Model 812 S/N 0748	L-D Model PRM828 S/N 2465	PCB 377B02 S/N 101840
E	L-D Model 820 S/N 0453	L-D Model PRM828 S/N 0901	B&K Type 4155 S/N 1582458
F	L-D Model 820 S/N 1592	L-D Model PRM828 S/N 2513	PCB 377B02 S/N 108657
G	L-D Model 700 S/N 1576	L-D Model 785 S/N 0291	B&K Type 4155 S/N 1703442
H	L-D Model 700 S/N 2062	L-D Model 785A S/N 0253	B&K Type 4155 S/N 1287509
I	L-D Model 700 S/N 0790	L-D Model 785 S/N 0332	B&K Type 4155 S/N 1265455

NIST-traceable calibration with B&K Type 4230 Acoustical Calibrator S/N 1510494

PROCEDURES

The meters were programmed to store A-weighted sound pressure level data at one hour intervals with statistical levels of L_2, L_8, L_{25}, and L_{90}. The L_2, L_8 and L_{25} metrics were selected to correspond with allowable noise limit exceedance durations of 1.5, 5, and 15 minutes specified in WAC 173-60-040. The meters were calibrated prior to each deployment and the calibration was checked at the completion of each measurement period. Calibration was provided by a NIST-traceable acoustical calibrator producing a 1000 Hz tone at a level of 93.8 decibels referenced to the standard 20 micropascals.

All noise monitors were mounted on safely-accessible wood utility poles or tree trunks with the microphone at a height of approximately 10 feet above ground level. Photographs of many of the noise monitor installations are shown in Figure 4 through Figure 15. The installations shown are representative of the remaining locations where good quality images were not obtained.

At the completion of each measurement, the data logged by the sound level meters were downloaded to laptop computer. The daily noise metrics were computed, and hourly noise levels were plotted using WIA proprietary software.

RESULTS

All post-measurement calibration checks were determined to be within 0.5 decibels of the initial calibration, with the exception of the meter at Location 2 in Centralia whose calibration check was 3.8 decibels lower. Data from Location 2 should be used with caution.

A summary of daily noise descriptors for each day of measurement at all locations is included in Table 3. Note that the L_{dn} and CNEL values are generally within one decibel, which is typical of environmental noise dominated by daytime human activity. The hourly statistical noise levels for each 24 hour period of measurement and at all eighteen locations are plotted Figure 16 through Figure 123. The hourly L_{eq} for six days of measurement at Locations 1 through 20 are plotted in in Figure 124 through Figure 141.

Table 3: Summary of daily noise descriptors

LOCATION	DATE	Ldn (dBA)	CNEL (dBA)	Leq_day (dBA)	Leq_night (dBA)
Loc 1 1023 B St, Centralia, WA **Setup F**	Sat, Apr 4, 2015	83	83	77	76
	Sun, Apr 5, 2015	72	72	69	65
	Mon, Apr 6, 2015	81	82	65	75
	Tue, Apr 7, 2015	79	79	73	72
	Wed, Apr 8, 2015	83	83	73	77
	Thu, Apr 9, 2015	86	86	75	80
Loc 2 1102 G St, Centralia, WA **Setup B**	Sat, Apr 4, 2015	81	81	76	74
	Sun, Apr 5, 2015	72	72	66	66
	Mon, Apr 6, 2015	79	80	66	73
	Tue, Apr 7, 2015	82	82	71	76
	Wed, Apr 8, 2015	82	82	75	76
	Thu, Apr 9, 2015	83	83	75	77
Loc 3 1103 J St, Centralia, WA **Setup E**	Sat, Apr 4, 2015	82	82	74	76
	Sun, Apr 5, 2015	71	71	59	65
	Mon, Apr 6, 2015	73	74	59	66
	Tue, Apr 7, 2015	78	78	70	72
	Wed, Apr 8, 2015	78	78	63	72
	Thu, Apr 9, 2015	81	81	74	75
Loc 4 3900 Kuper Rd, Centralia, WA **Setup C**	Sat, Apr 11, 2015	70	72	70	60
	Sun, Apr 12, 2015	73	73	63	67
	Mon, Apr 13, 2015	70	70	68	63
	Tue, Apr 14, 2015	73	73	72	66
	Wed, Apr 15, 2015	71	72	71	63
	Thu, Apr 16, 2015	74	74	70	67
Loc 5 Old Hwy 9 & Tea St SW, Rochester, WA **Setup D**	Sat, Apr 11, 2015	68	70	67	59
	Sun, Apr 12, 2015	68	70	65	61
	Mon, Apr 13, 2015	71	72	66	64
	Tue, Apr 14, 2015	71	71	70	62
	Wed, Apr 15, 2015	70	71	70	62
	Thu, Apr 16, 2015	74	74	71	67

LOCATION	DATE	Ldn (dBA)	CNEL (dBA)	Leq_day (dBA)	Leq_night (dBA)
Loc 6	Sat, Apr 4, 2015	72	73	72	62
	Sun, Apr 5, 2015	69	70	70	58
19318 Grand Mound Way, Rochester, WA	Mon, Apr 6, 2015	71	71	67	64
	Tue, Apr 7, 2015	71	72	72	62
	Wed, Apr 8, 2015	71	71	69	62
Setup D	Thu, Apr 9, 2015	72	73	72	62
Loc 8	Sat, Apr 4, 2015	68	69	68	59
	Sun, Apr 5, 2015	67	68	68	57
180th @ Little Rock, Rochester, WA	Mon, Apr 6, 2015	66	67	66	58
	Tue, Apr 7, 2015	68	68	67	59
Setup C	Wed, Apr 8, 2015	67	68	66	59
	Thu, Apr 9, 2015	70	70	66	63
Loc 9	Sat, Mar 28, 2015	66	67	65	58
	Sun, Mar 29, 2015	61	61	63	48
205 Murrey, Oakville, WA	Mon, Mar 30, 2015	72	72	56	66
	Tue, Mar 31, 2015	72	72	62	66
Setup G	Wed, Apr 1, 2015	67	67	60	60
	Thu, Apr 2, 2015	67	67	63	61
Loc 10	Sat, Mar 28, 2015	68	68	65	61
	Sun, Mar 29, 2015	62	63	63	53
22 Evergreen Village Lane, Elma, WA	Mon, Mar 30, 2015	71	71	66	64
	Tue, Mar 31, 2015	72	72	68	65
	Wed, Apr 1, 2015	73	73	69	66
Setup H	Thu, Apr 2, 2015	72	72	68	65
Loc 11	Sat, Mar 28, 2015	68	69	59	60
	Sun, Mar 29, 2015	62	62	63	51
513 N 13th ST, Elma, WA	Mon, Mar 30, 2015	66	67	60	60
	Tue, Mar 31, 2015	70	70	61	63
Setup D	Wed, Apr 1, 2015	69	70	67	62
	Thu, Apr 2, 2015	69	69	68	61

LOCATION	DATE	Ldn (dBA)	CNEL (dBA)	Leq_day (dBA)	Leq_night (dBA)
Loc 12	Sat, Mar 28, 2015	70	72	58	63
	Sun, Mar 29, 2015	67	67	69	47
502 N 13th ST, Elma, WA	Mon, Mar 30, 2015	73	73	71	64
	Tue, Mar 31, 2015	76	76	66	69
Setup A	Wed, Apr 1, 2015	66	68	66	52
	Thu, Apr 2, 2015	73	74	71	65
Loc 13	Sat, Mar 28, 2015	68	70	56	60
	Sun, Mar 29, 2015	66	66	68	48
57 Hurd Rd, Elma, WA	Mon, Mar 30, 2015	70	71	68	63
	Tue, Mar 31, 2015	71	72	66	64
Setup C	Wed, Apr 1, 2015	64	66	65	51
	Thu, Apr 2, 2015	71	72	67	63
Loc 14	Sat, Mar 28, 2015	71	73	62	64
	Sun, Mar 29, 2015	68	68	71	43
510 Foss Ave, Satsop, WA	Mon, Mar 30, 2015	75	75	69	68
	Tue, Mar 31, 2015	75	75	67	68
Setup E	Wed, Apr 1, 2015	67	69	67	52
	Thu, Apr 2, 2015	73	74	71	65
Loc 15	Sat, Mar 28, 2015	69	71	63	60
	Sun, Mar 29, 2015	67	67	69	53
78 Devonshire, Montesano, WA	Mon, Mar 30, 2015	72	73	67	66
	Tue, Mar 31, 2015	68	70	69	55
Setup B	Wed, Apr 1, 2015	67	68	68	56
	Thu, Apr 2, 2015	73	75	68	65
Loc 16	Sat, Mar 28, 2015	72	72	64	65
	Sun, Mar 29, 2015	67	68	69	55
140 S Chehalis ST, Aberdeen, WA	Mon, Mar 30, 2015	75	76	69	69
	Tue, Mar 31, 2015	74	74	68	67
Setup F	Wed, Apr 1, 2015	70	72	69	61
	Thu, Apr 2, 2015	74	74	69	68

LOCATION	DATE	Ldn (dBA)	CNEL (dBA)	Leq_day (dBA)	Leq_night (dBA)
Loc 18	Sat, Mar 28, 2015	74	74	62	68
	Sun, Mar 29, 2015	65	66	66	56
2100 1st ST, Aberdeen, WA	Mon, Mar 30, 2015	67	68	62	61
	Tue, Mar 31, 2015	71	71	72	60
Setup I	Wed, Apr 1, 2015	72	72	69	65
	Thu, Apr 2, 2015	65	65	63	58
Loc 19	Sat, Apr 4, 2015	72	72	69	65
	Sun, Apr 5, 2015	62	63	65	45
11846 170th Ave, Rochester, WA	Mon, Apr 6, 2015	66	68	67	48
	Tue, Apr 7, 2015	72	72	62	66
Setup A	Wed, Apr 8, 2015	74	75	64	68
	Thu, Apr 9, 2015	76	76	67	69
Loc 20	Sat, Apr 11, 2015	60	62	62	46
	Sun, Apr 12, 2015	64	64	56	58
7220 Central Park Dr, Aberdeen, WA	Mon, Apr 13, 2015	64	65	58	57
	Tue, Apr 14, 2015	62	62	62	53
Setup A	Wed, Apr 15, 2015	64	64	62	56
	Thu, Apr 16, 2015	60	62	61	46

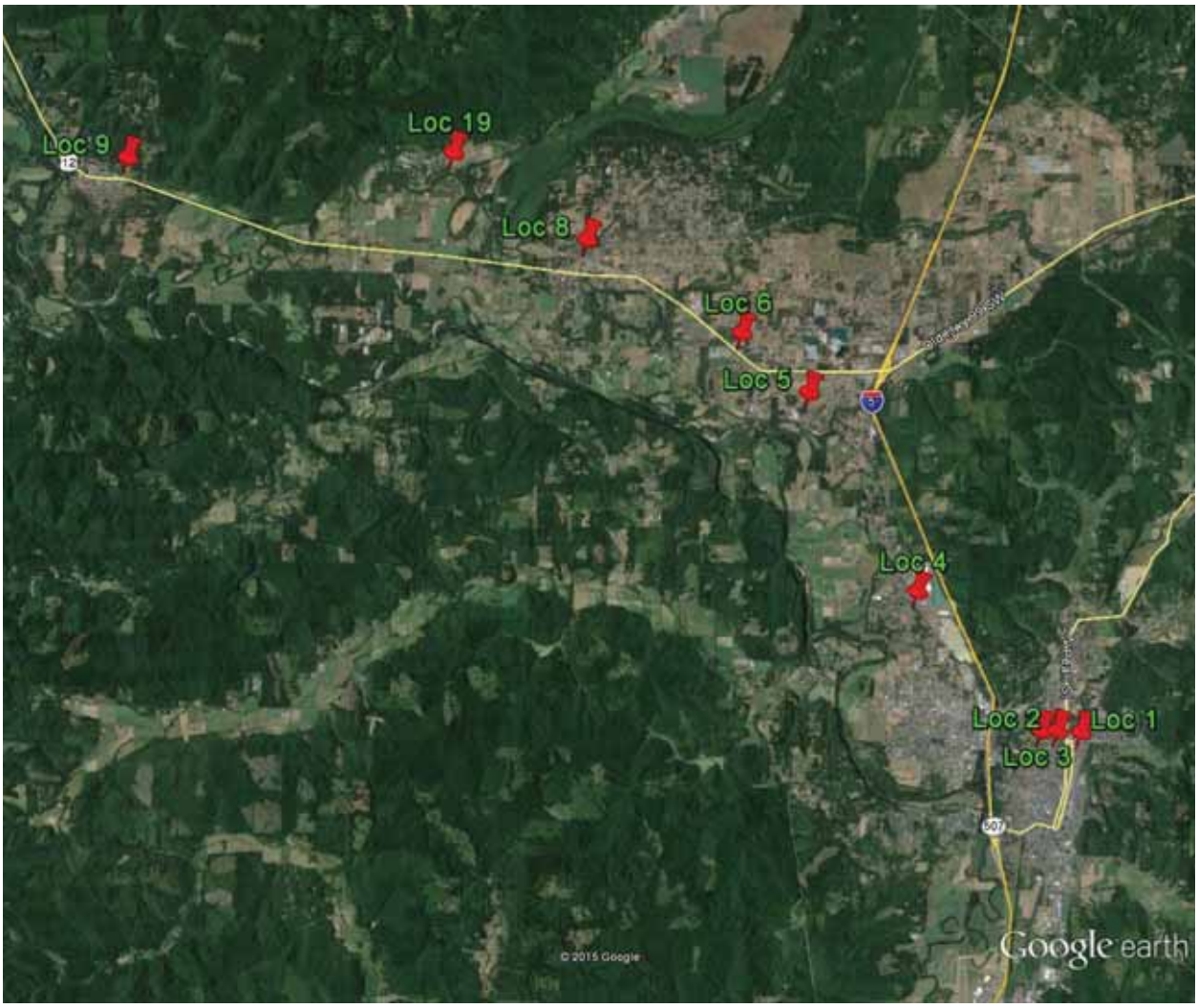

Figure 1: Centralia, Rochester, and Oakville Survey Locations

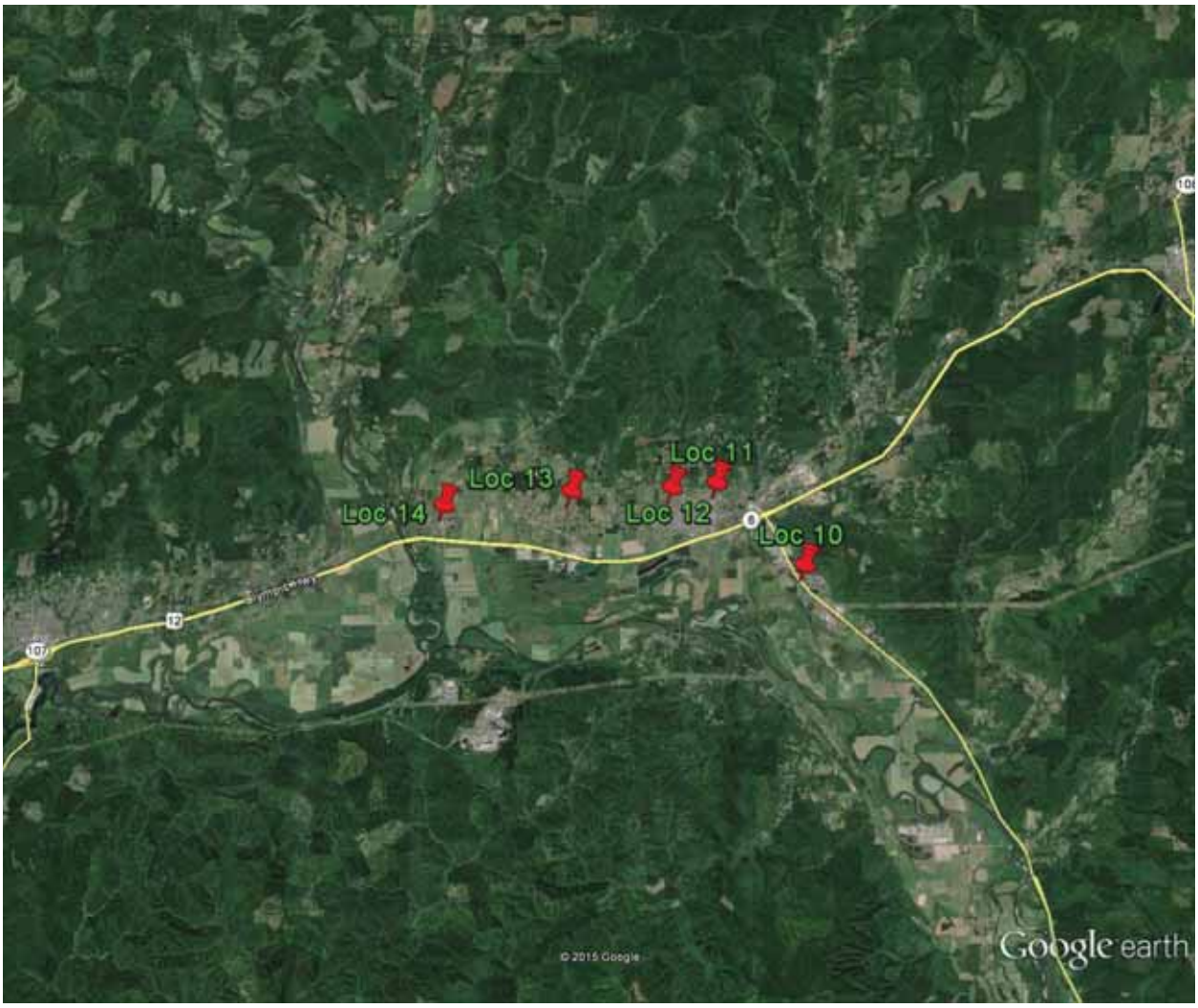

Figure 2: Elma & Satsop Survey Locations

Figure 3: Aberdeen Survey Locations

Figure 4: Location 1 noise monitor installation

Figure 5: Location 2 noise monitor installation

Figure 6: Location 3 noise monitor installation

Figure 7: Location 5 noise monitor installation

Figure 8: Location 6 noise monitor installation

Figure 9: Location 11 noise monitor installation

Figure 10: Location 12 noise monitor installation

Figure 11: Location 13 noise monitor installation

Figure 12: Location 14 noise monitor installation

Figure 13: Location 15 noise monitor installation

Figure 14: Location 16 noise monitor installation

Figure 15: Location 20 noise monitor installation

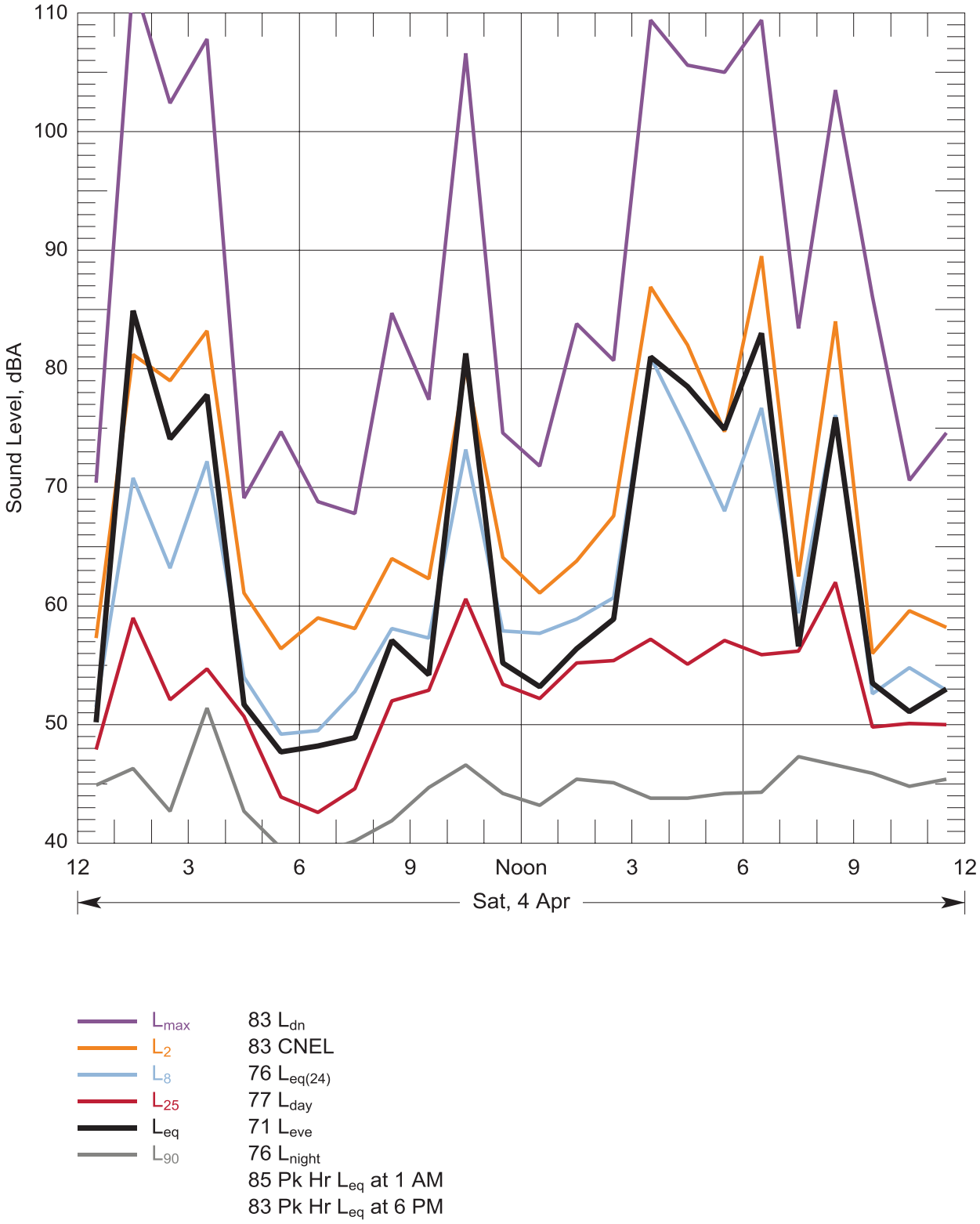

Figure 16: Hourly statistical summary of noise levels measured at Location 1 - 1023 B St, Centralia on 04 Apr, 2015 and daily-average descriptors

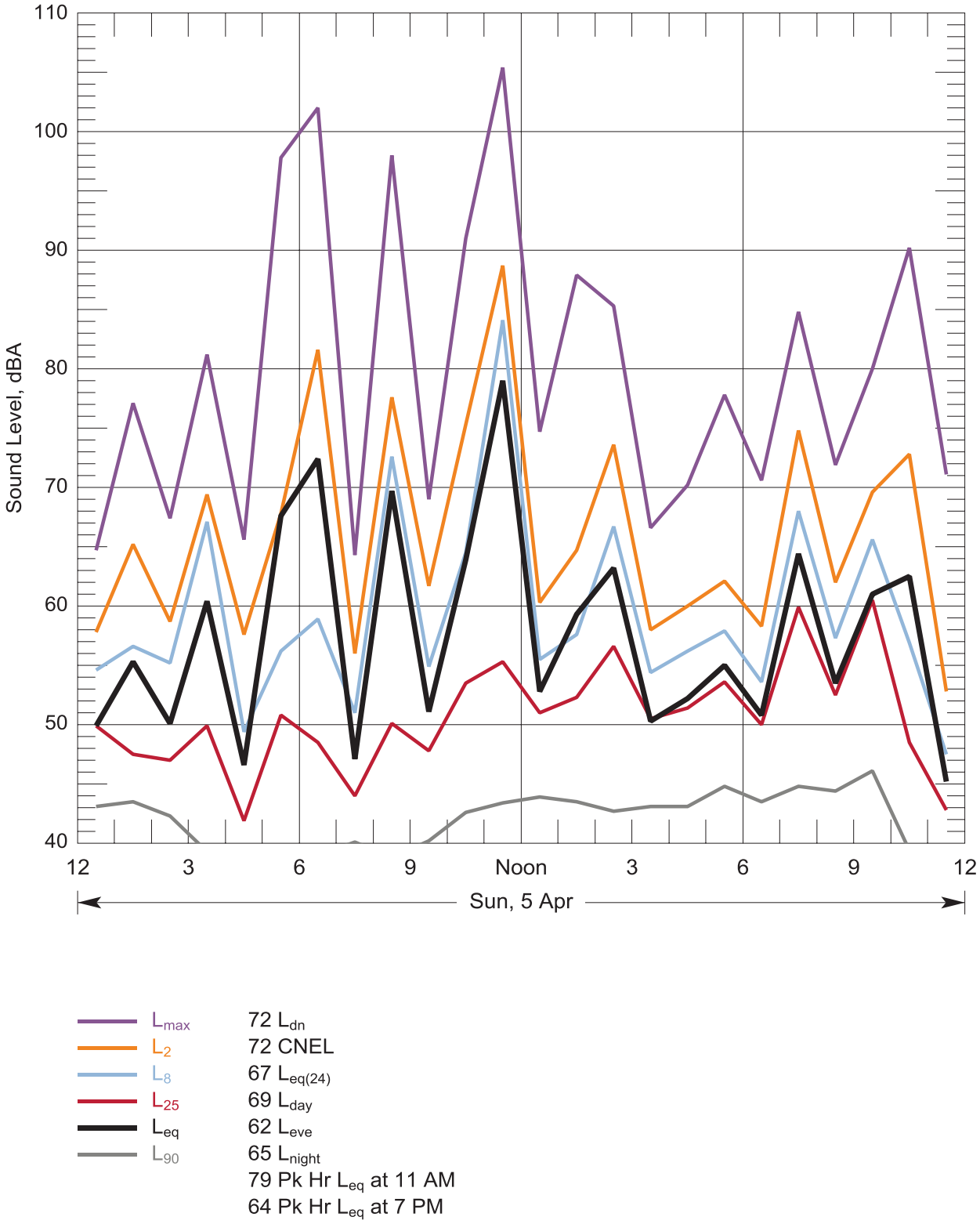

Figure 17: Hourly statistical summary of noise levels measured at Location 1 - 1023 B St, Centralia on 05 Apr, 2015 and daily-average descriptors

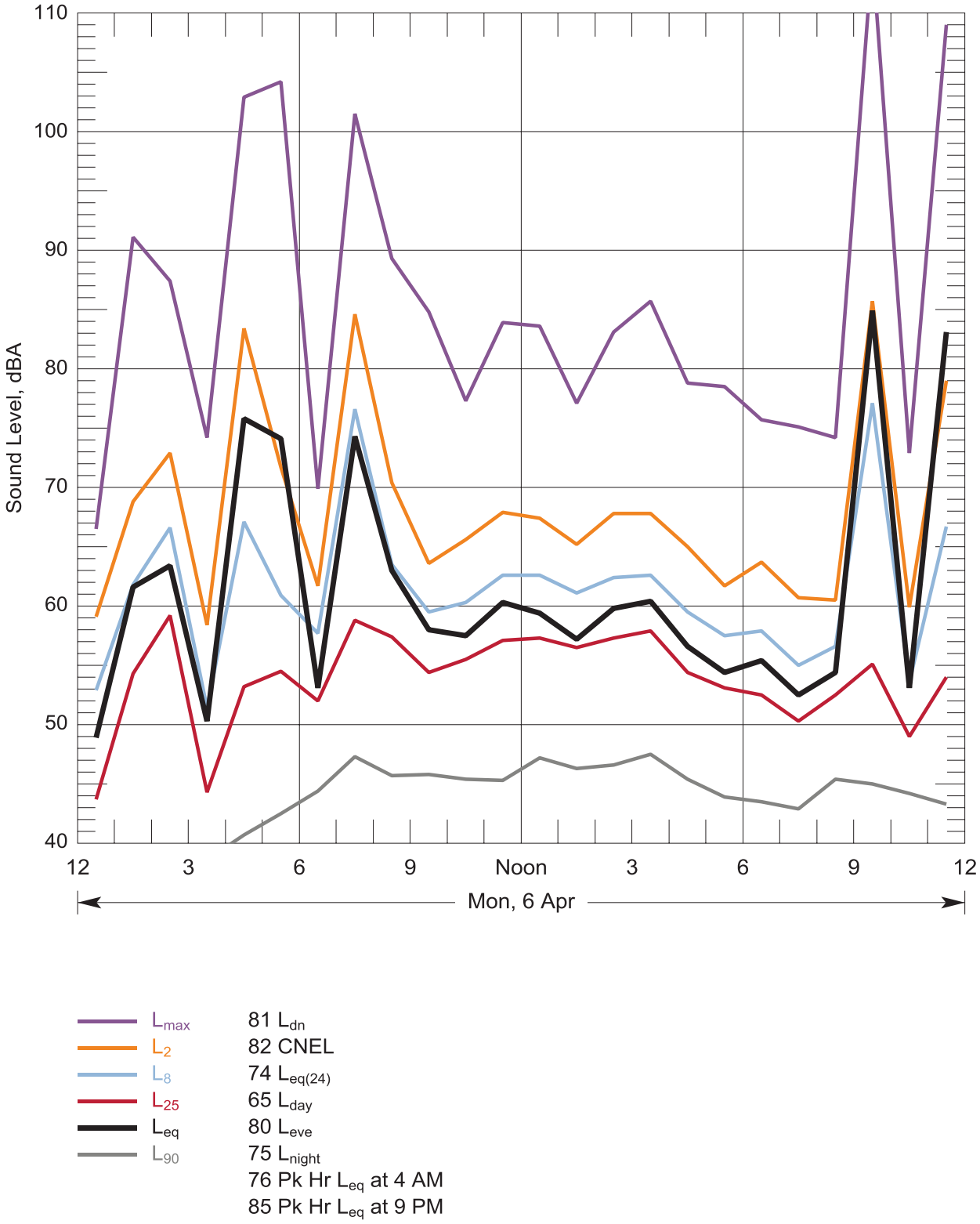

Figure 18: Hourly statistical summary of noise levels measured at Location 1 - 1023 B St, Centralia on 06 Apr, 2015 and daily-average descriptors

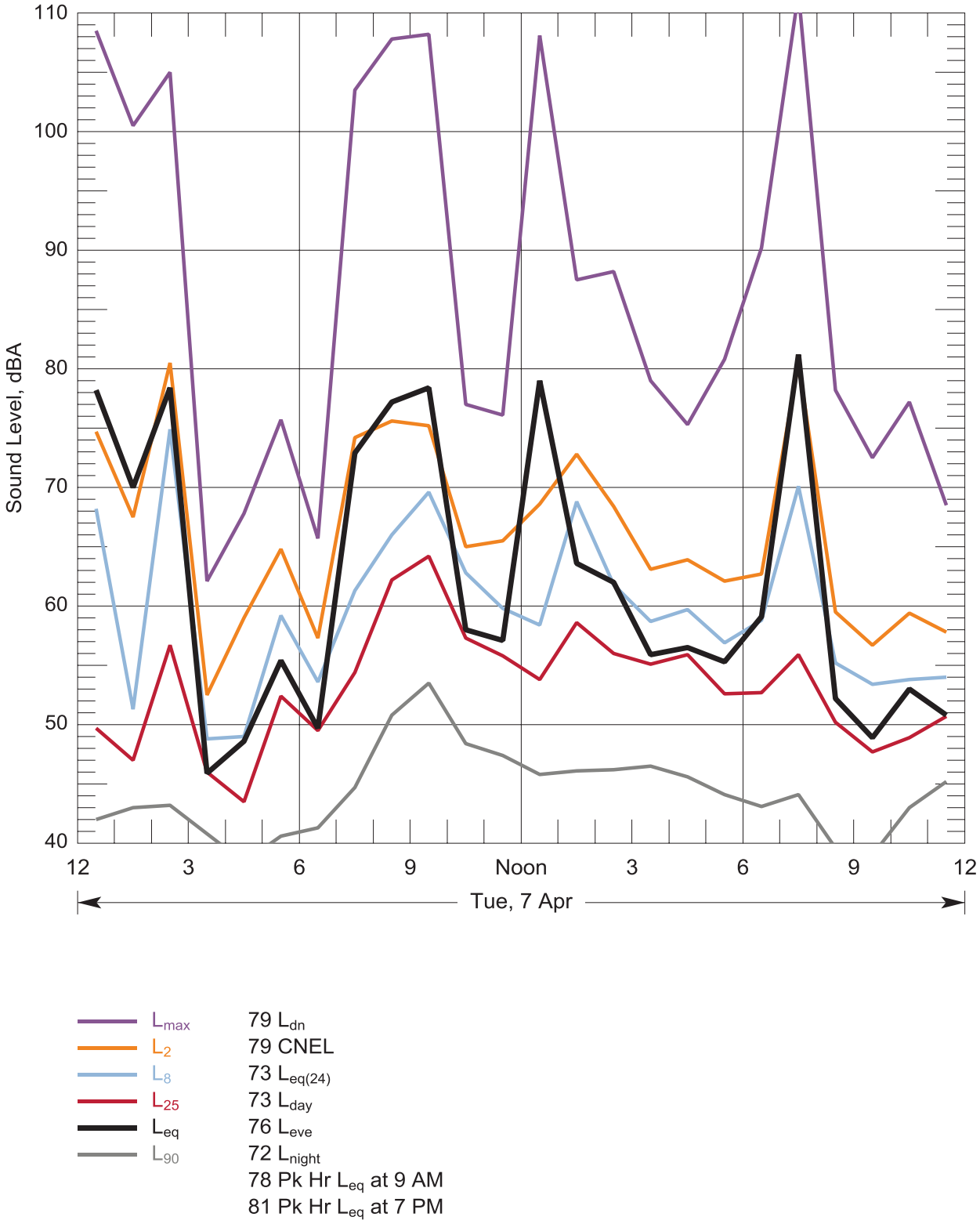

Figure 19: Hourly statistical summary of noise levels measured at Location 1 - 1023 B St, Centralia on 07 Apr, 2015 and daily-average descriptors

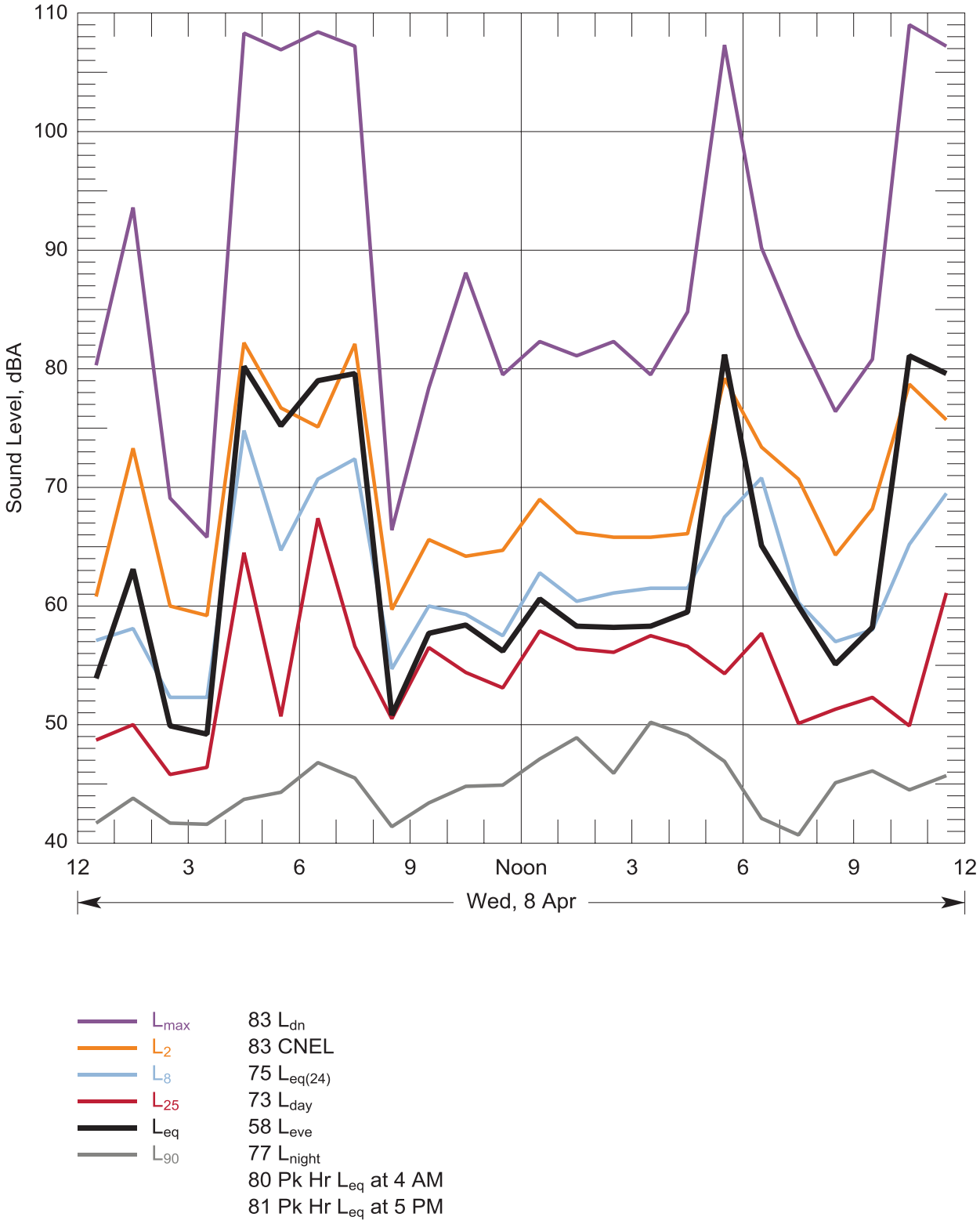

Figure 20: Hourly statistical summary of noise levels measured at Location 1 - 1023 B St, Centralia on 08 Apr, 2015 and daily-average descriptors

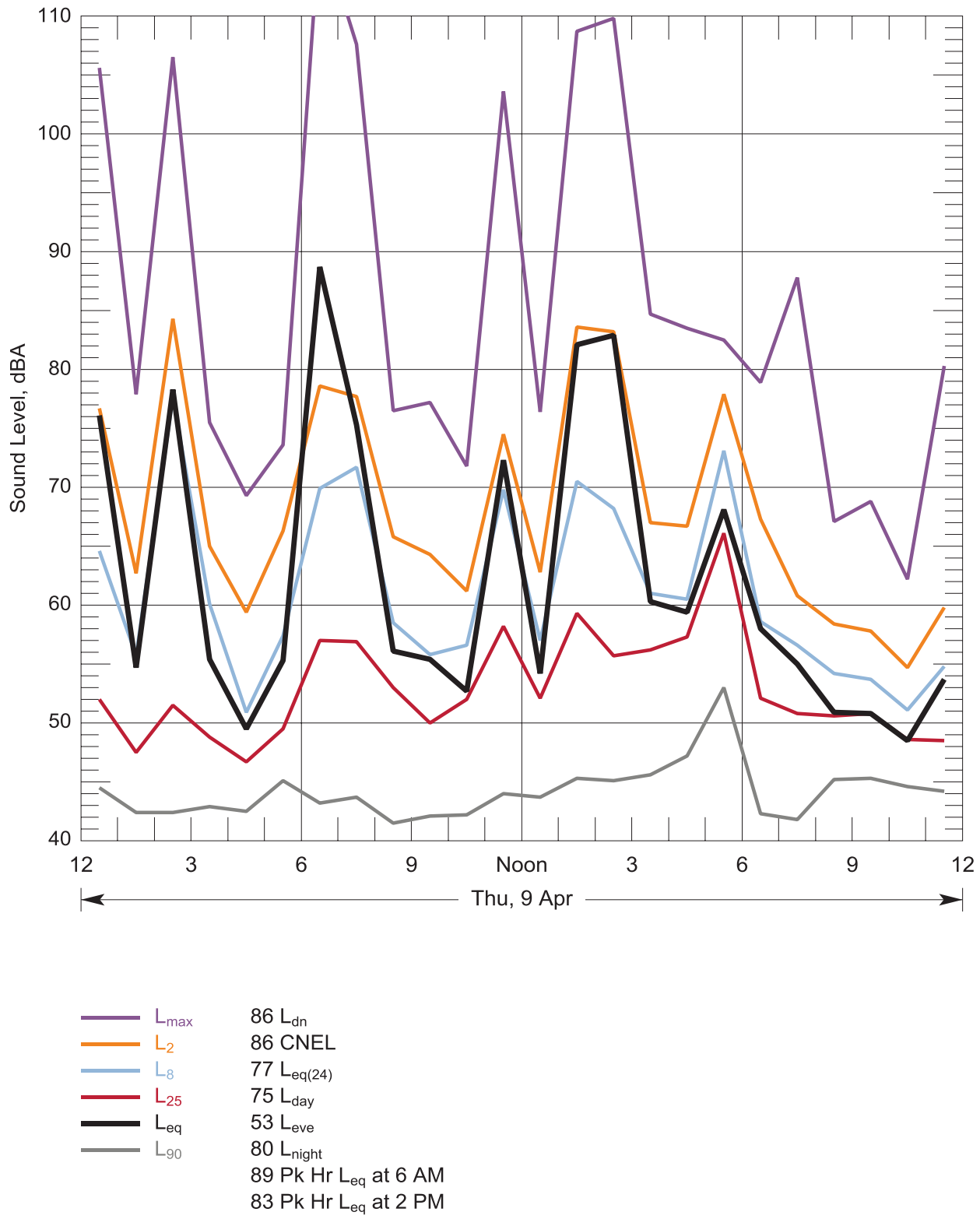

Figure 21: Hourly statistical summary of noise levels measured at Location 1 - 1023 B St, Centralia on 09 Apr, 2015 and daily-average descriptors

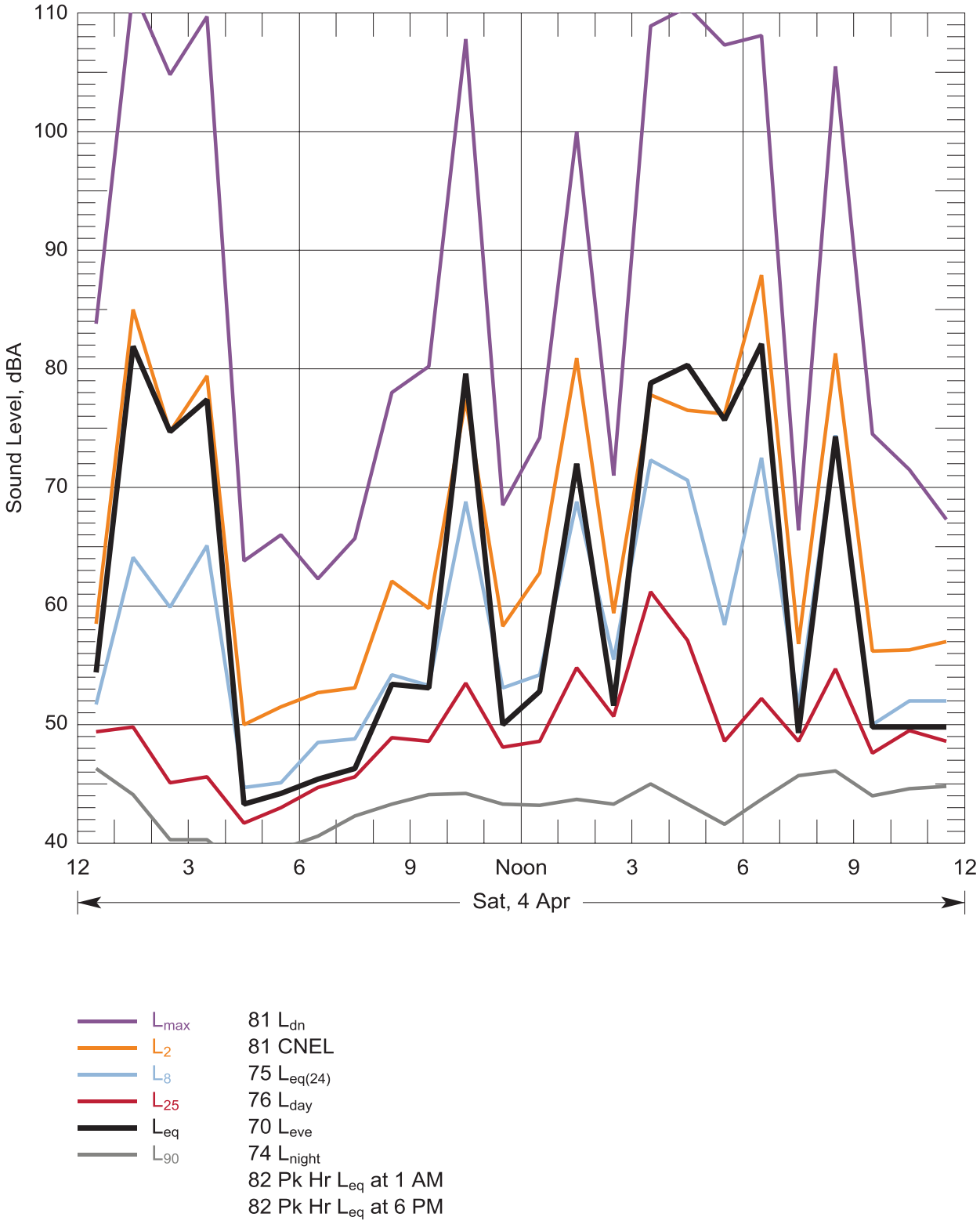

Figure 22: Hourly statistical summary of noise levels measured at Location 2 - 1102 G St, Centralia on 04 Apr, 2015 and daily-average descriptors

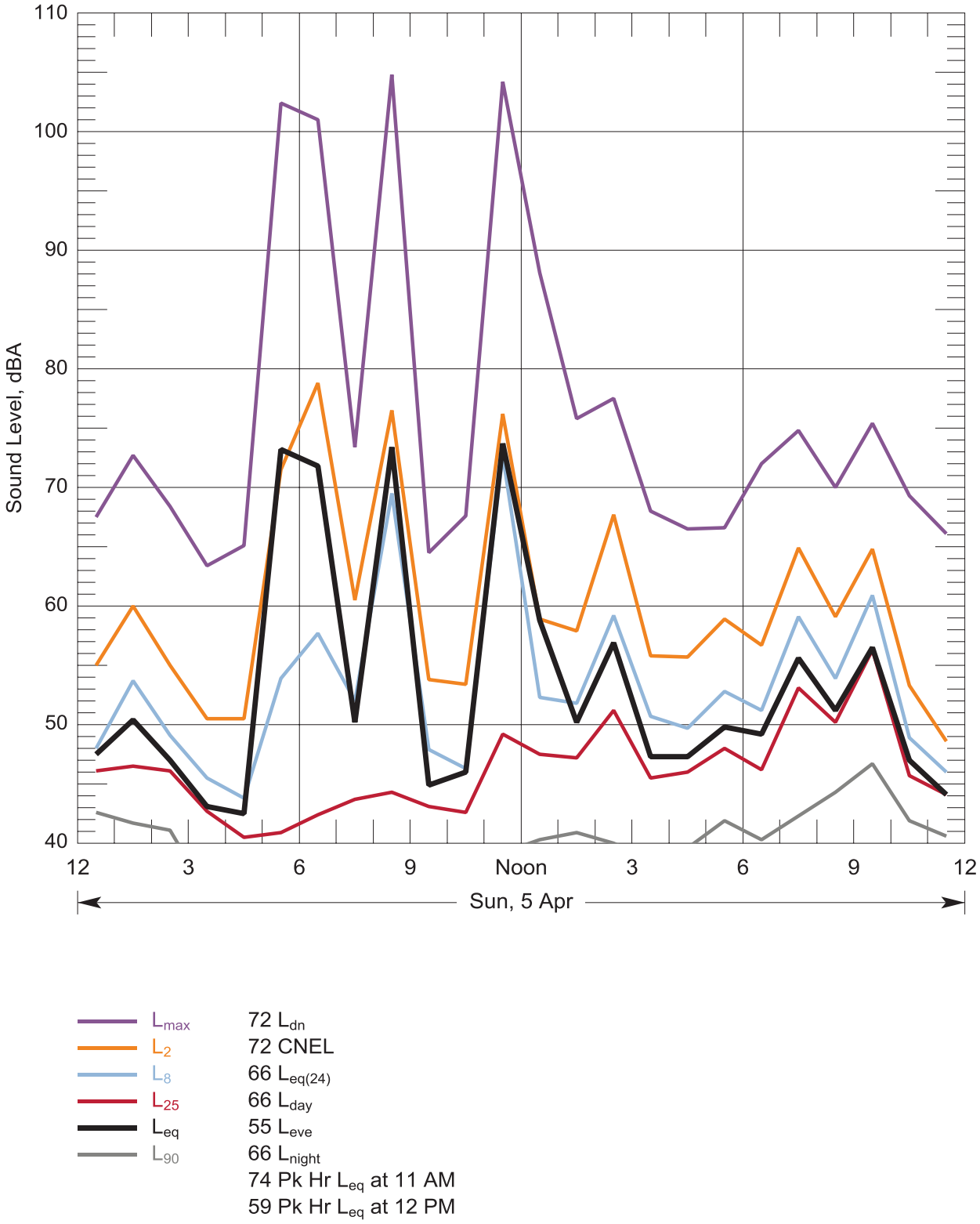

Figure 23: Hourly statistical summary of noise levels measured at Location 2 - 1102 G St, Centralia on 05 Apr, 2015 and daily-average descriptors

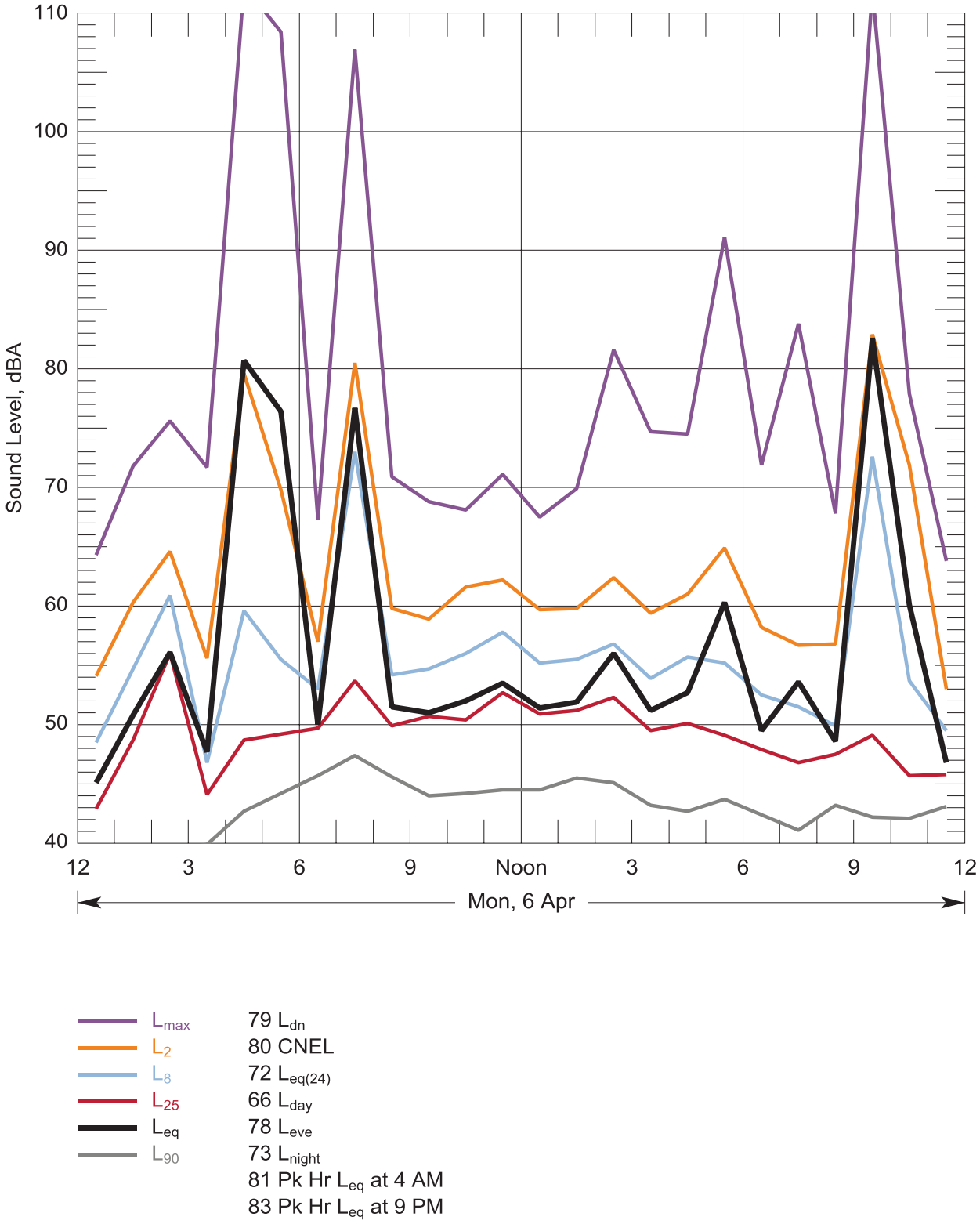

Figure 24: Hourly statistical summary of noise levels measured at Location 2 - 1102 G St, Centralia on 06 Apr, 2015 and daily-average descriptors

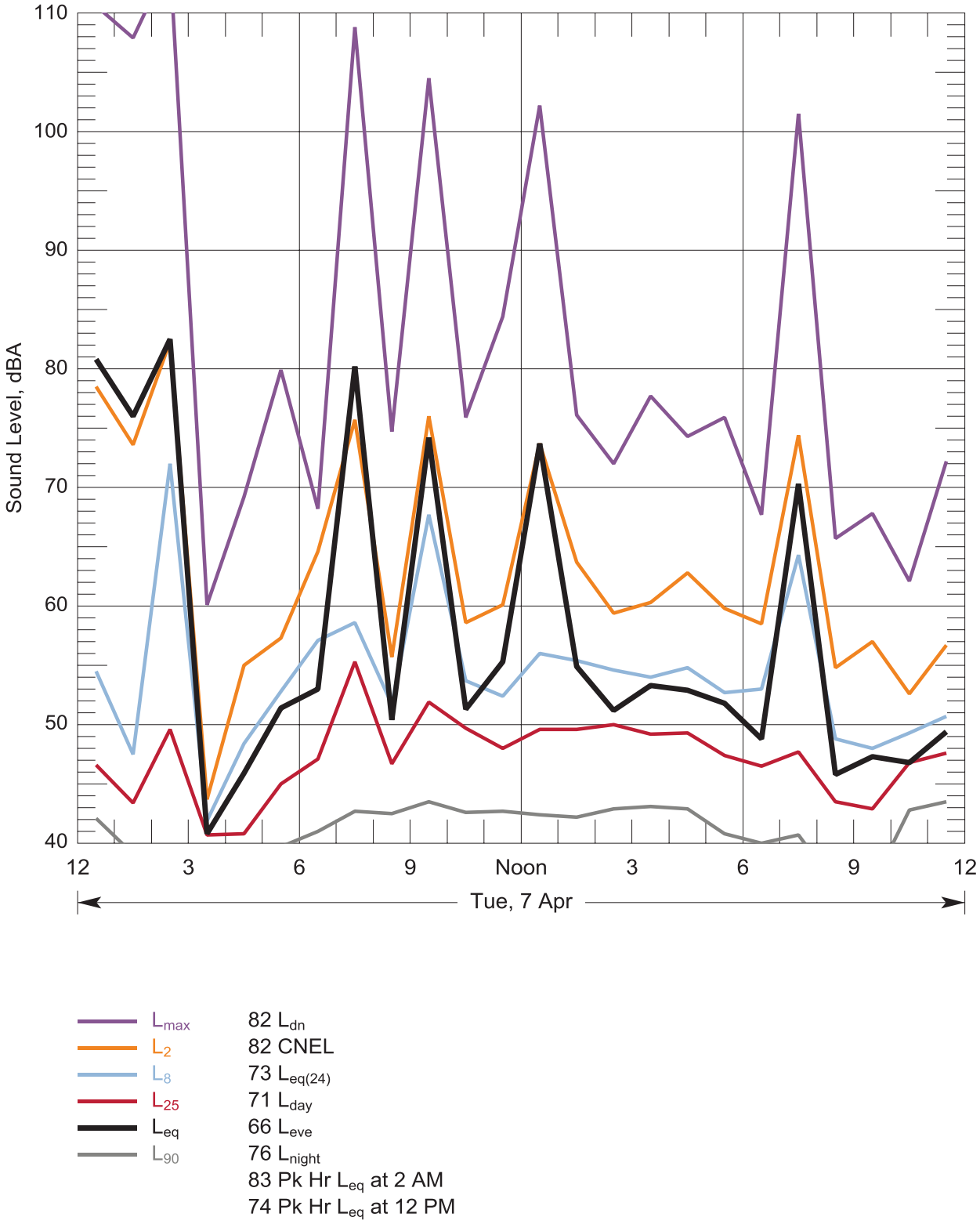

Figure 25: Hourly statistical summary of noise levels measured at Location 2 - 1102 G St, Centralia on 07 Apr, 2015 and daily-average descriptors

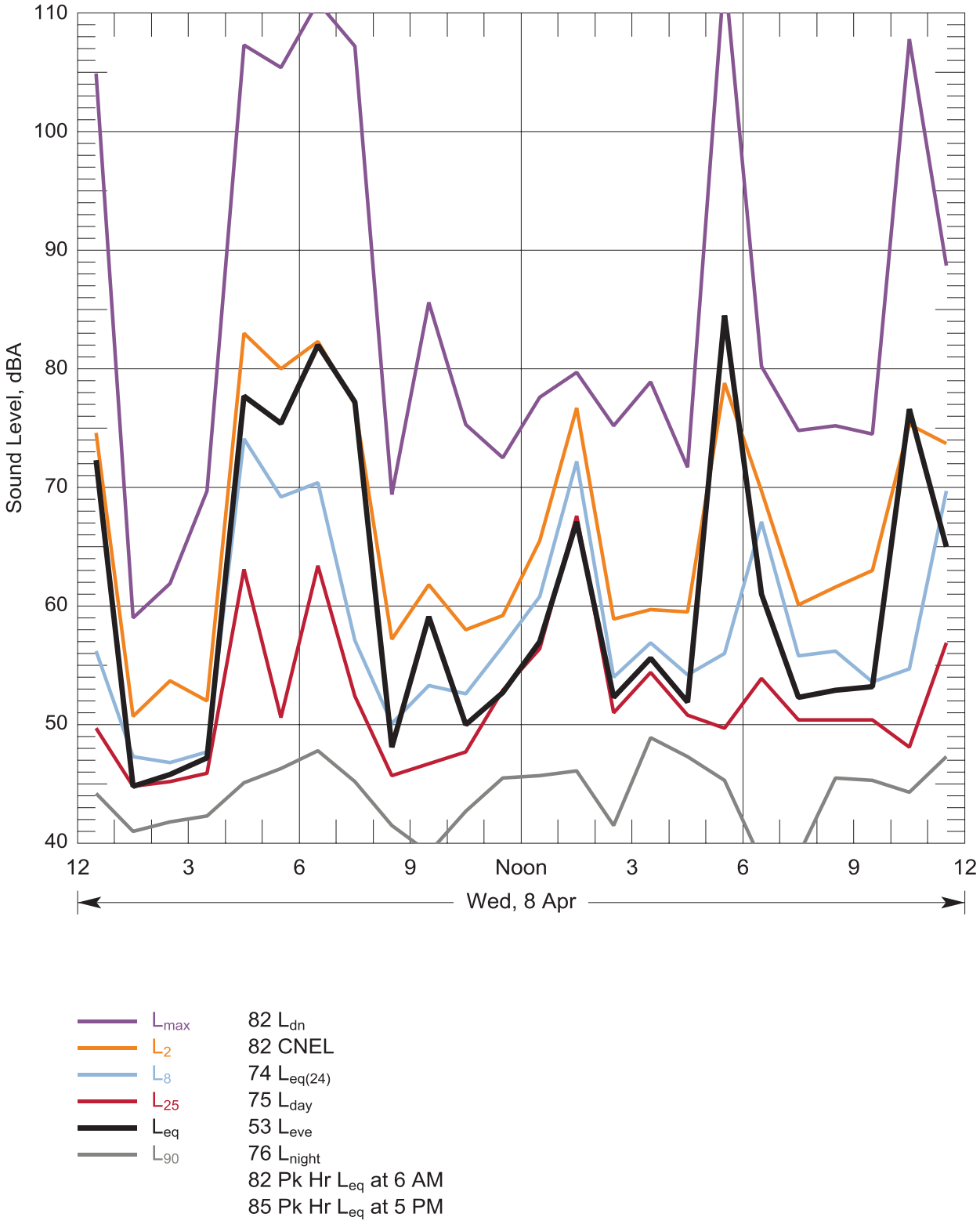

Figure 26: Hourly statistical summary of noise levels measured at Location 2 - 1102 G St, Centralia on 08 Apr, 2015 and daily-average descriptors

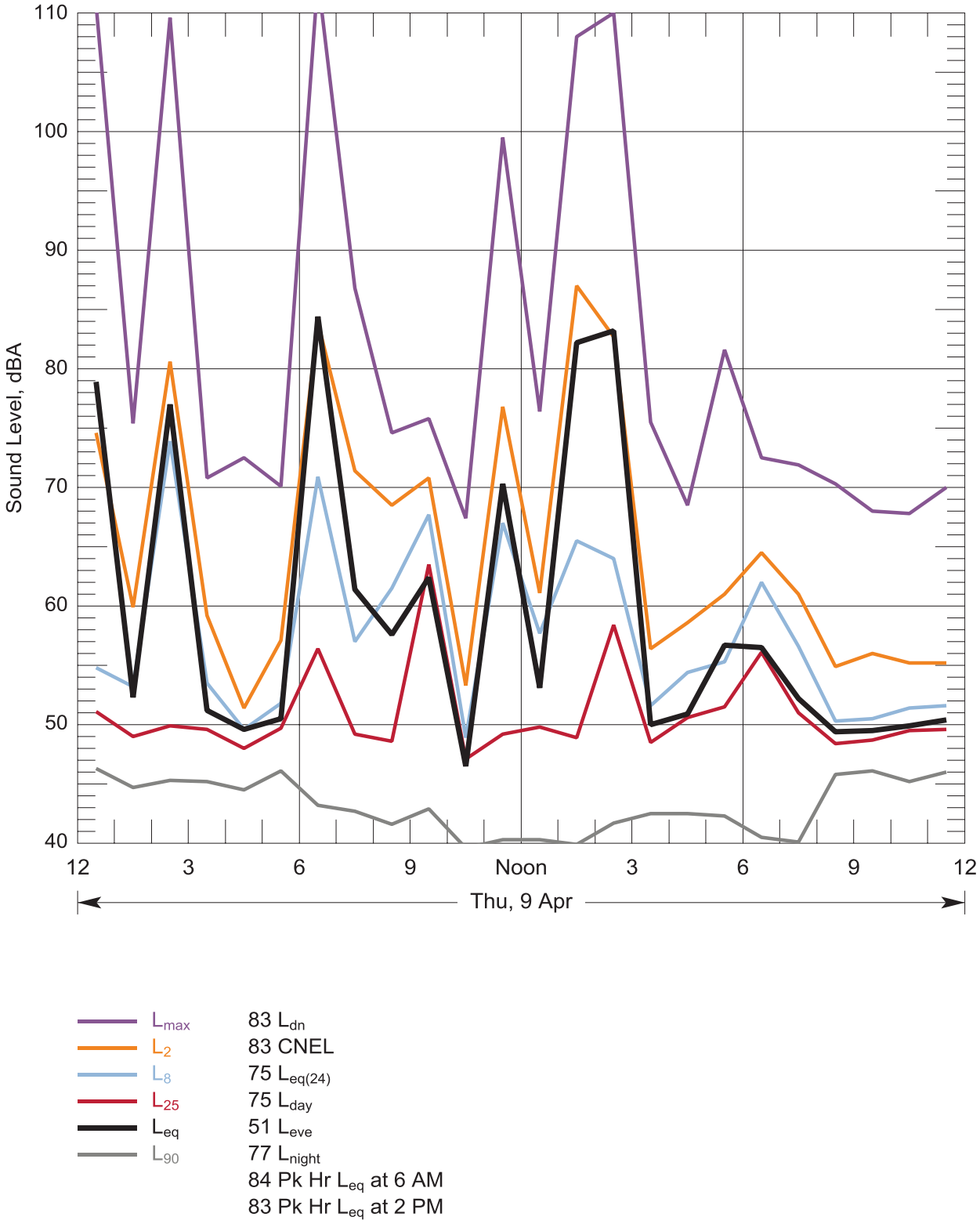

Figure 27: Hourly statistical summary of noise levels measured at Location 2 - 1102 G St, Centralia on 09 Apr, 2015 and daily-average descriptors

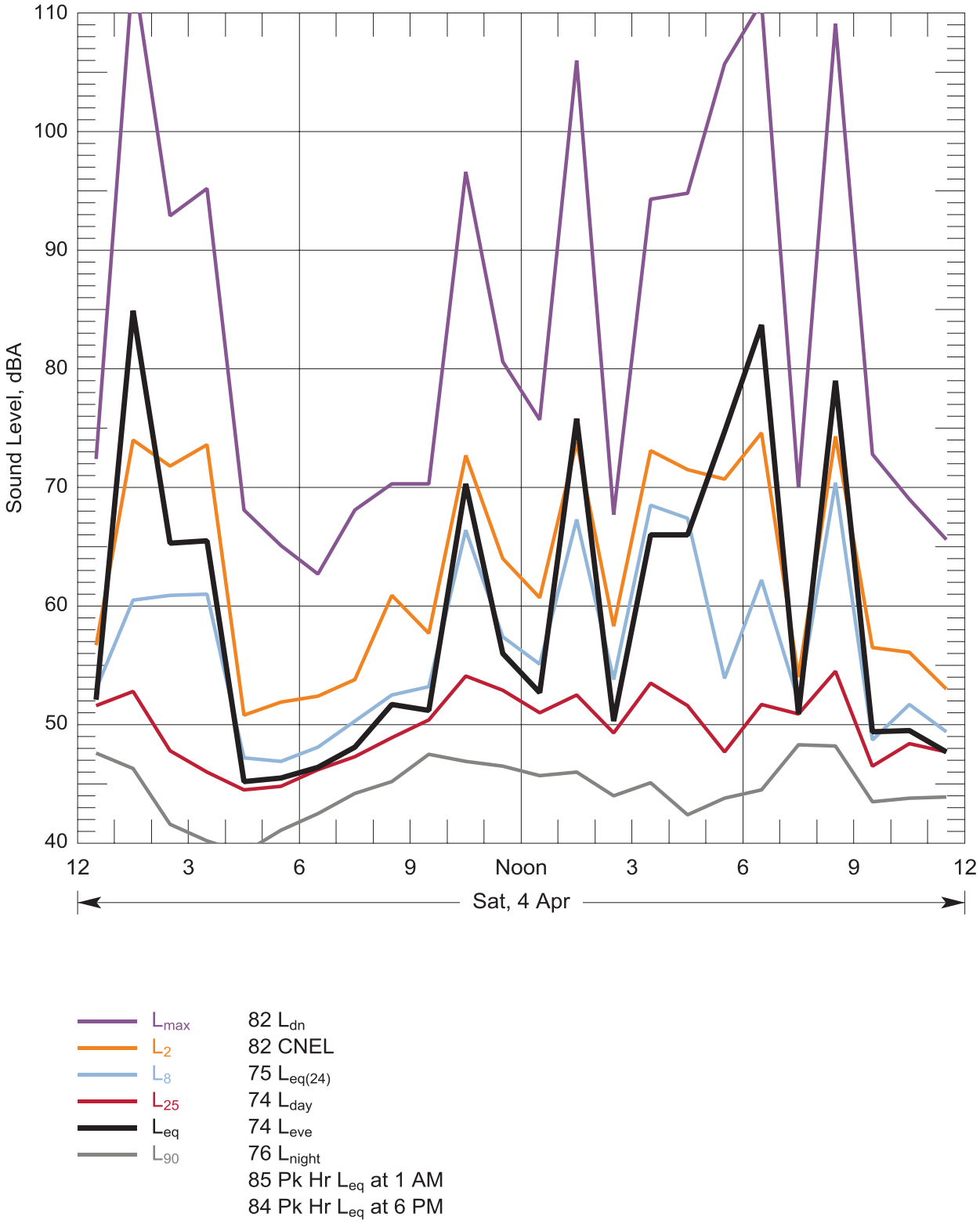

Figure 28: Hourly statistical summary of noise levels measured at Location 3 - 1103 J St, Centralia on 04 Apr, 2015 and daily-average descriptors

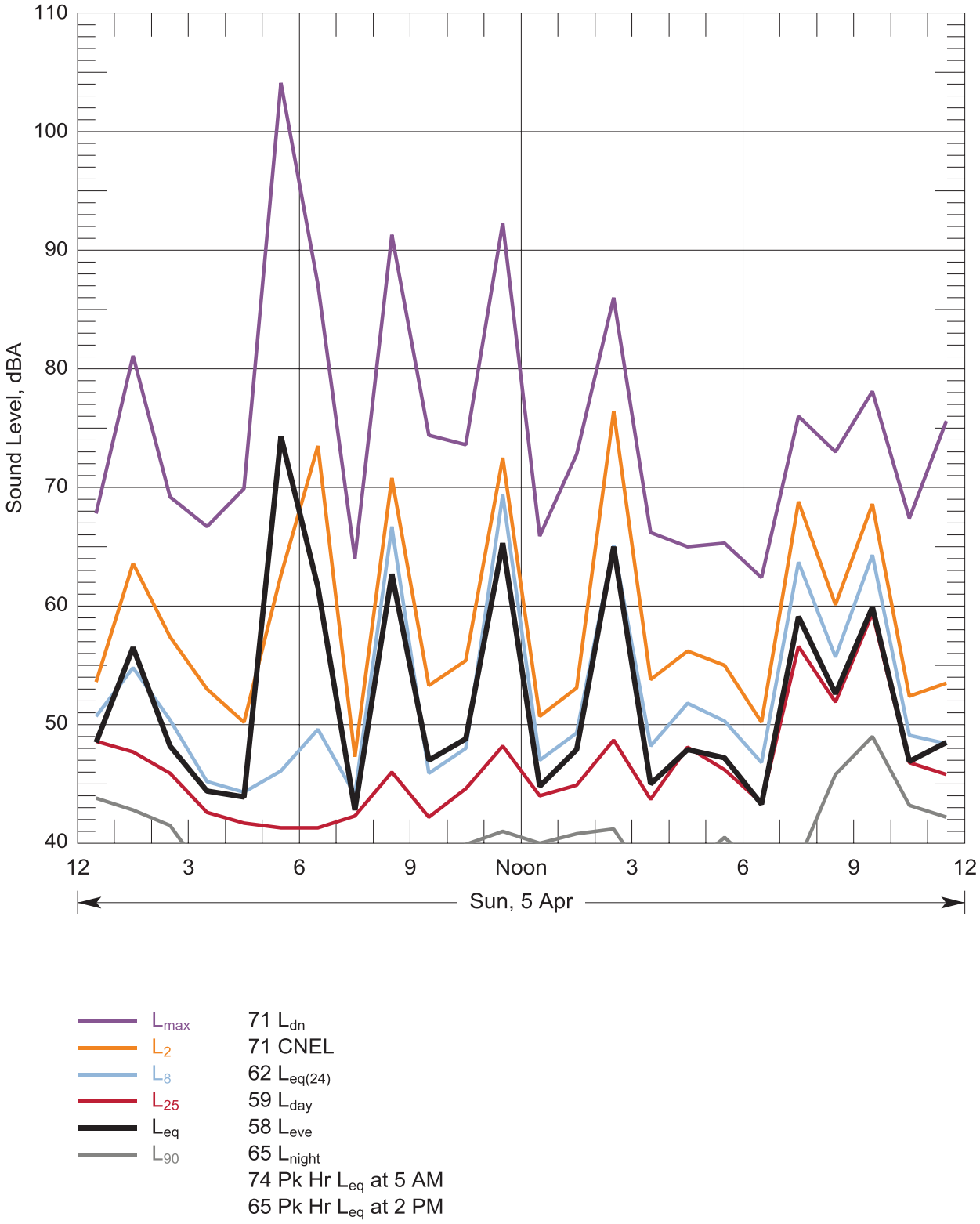

Figure 29: Hourly statistical summary of noise levels measured at Location 3 - 1103 J St, Centralia on 05 Apr, 2015 and daily-average descriptors

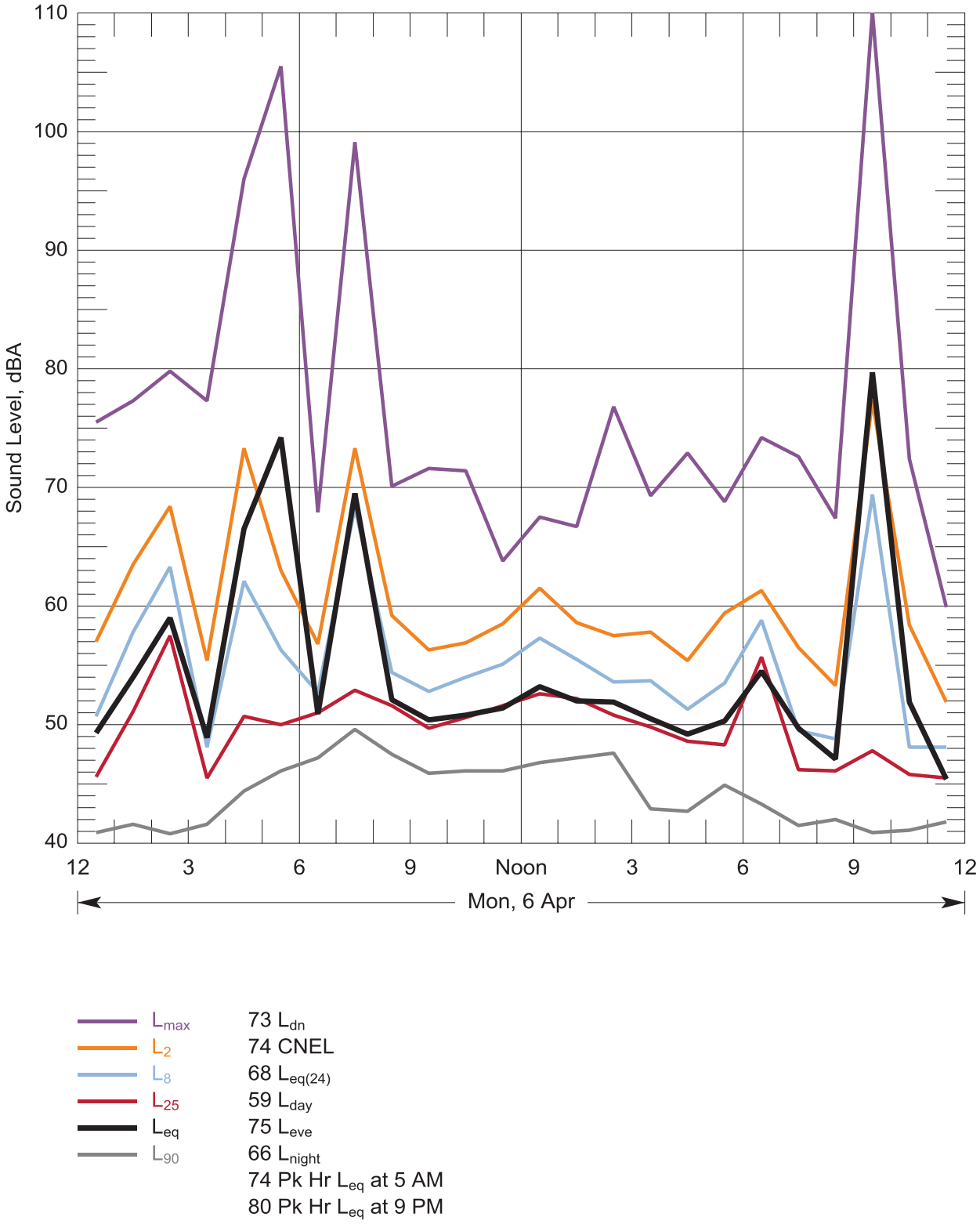

Figure 30: Hourly statistical summary of noise levels measured at Location 3 - 1103 J St, Centralia on 06 Apr, 2015 and daily-average descriptors

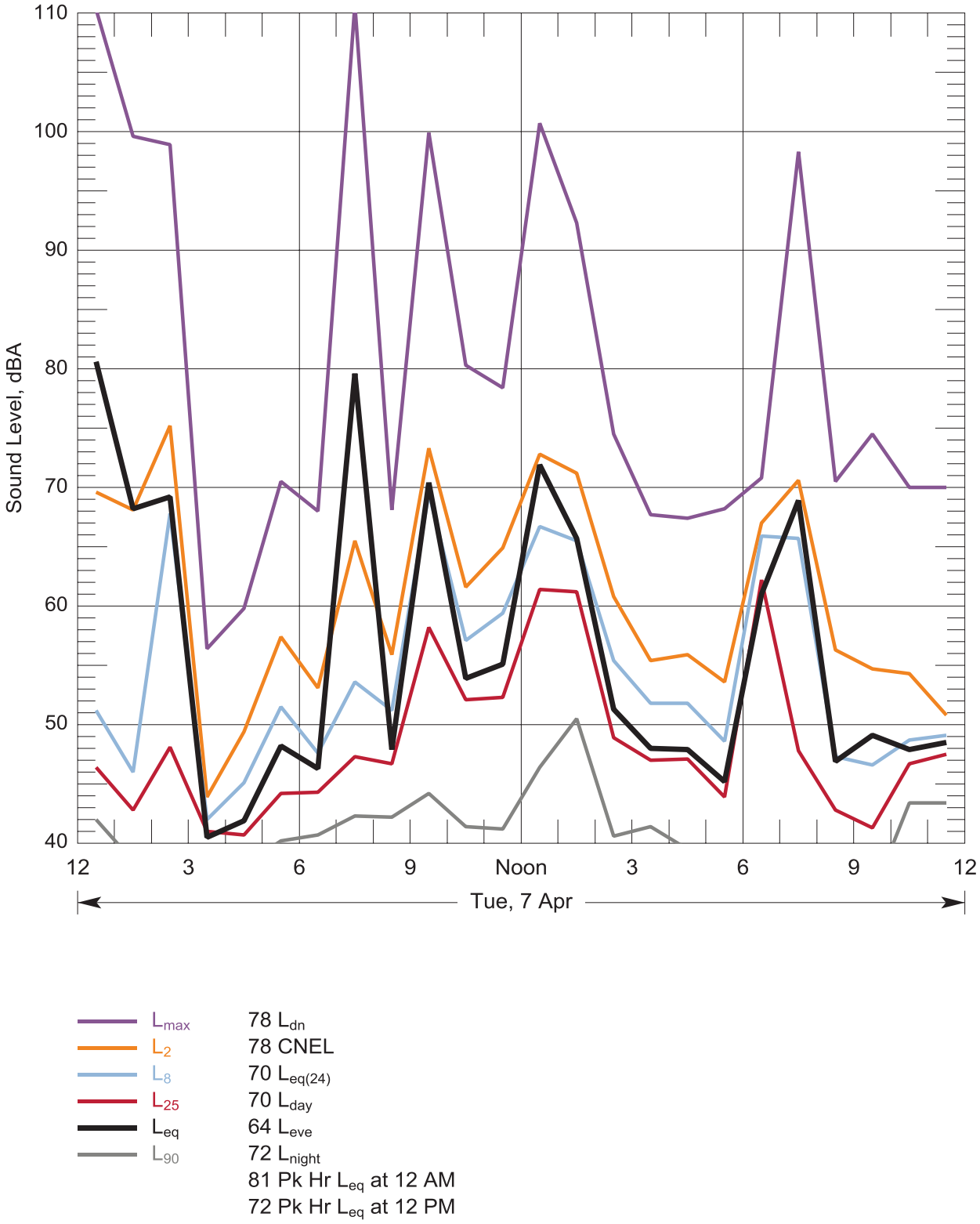

Figure 31: Hourly statistical summary of noise levels measured at Location 3 - 1103 J St, Centralia on 07 Apr, 2015 and daily-average descriptors

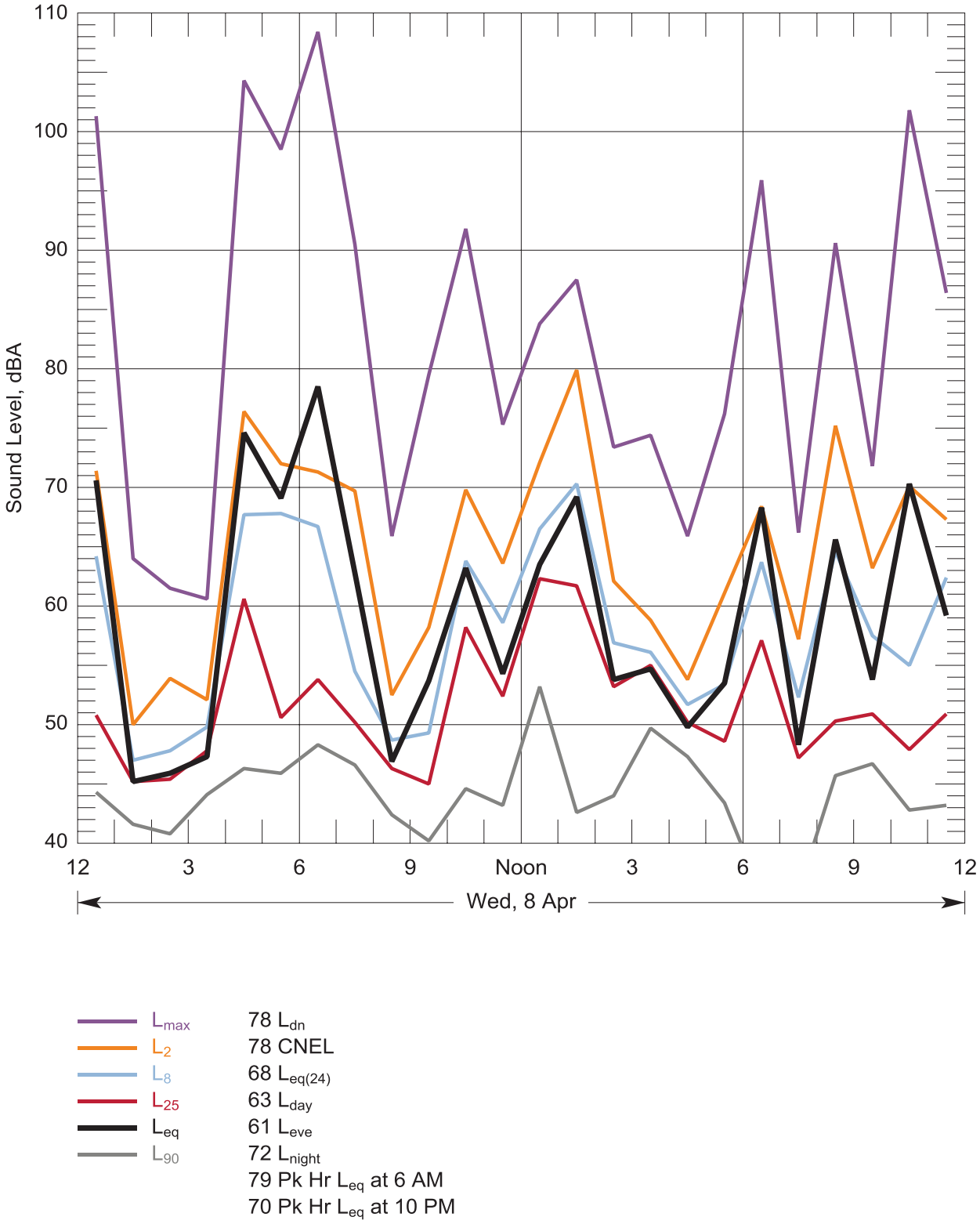

Figure 32: Hourly statistical summary of noise levels measured at Location 3 - 1103 J St, Centralia on 08 Apr, 2015 and daily-average descriptors

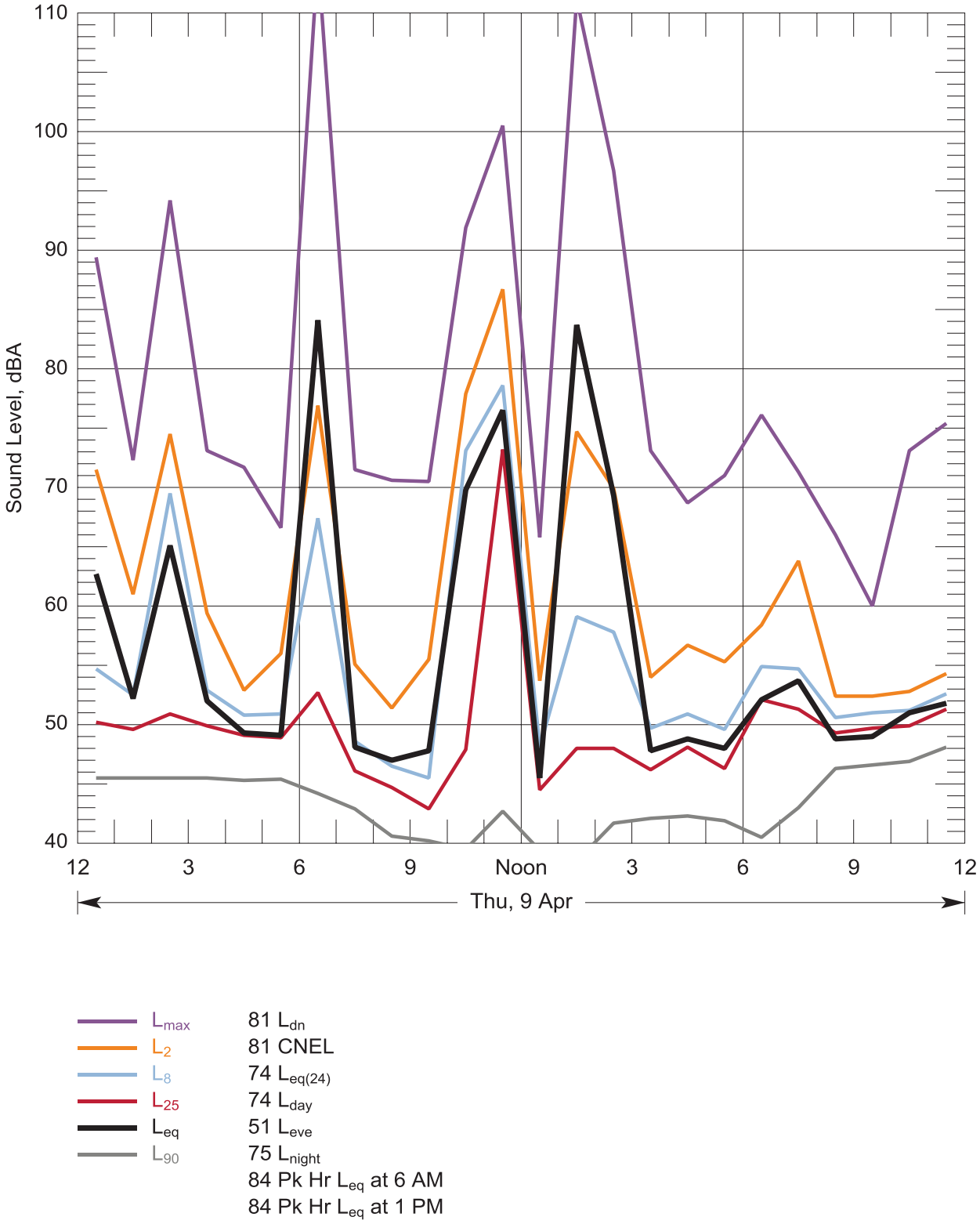

Figure 33: Hourly statistical summary of noise levels measured at Location 3 - 1103 J St, Centralia on 09 Apr, 2015 and daily-average descriptors

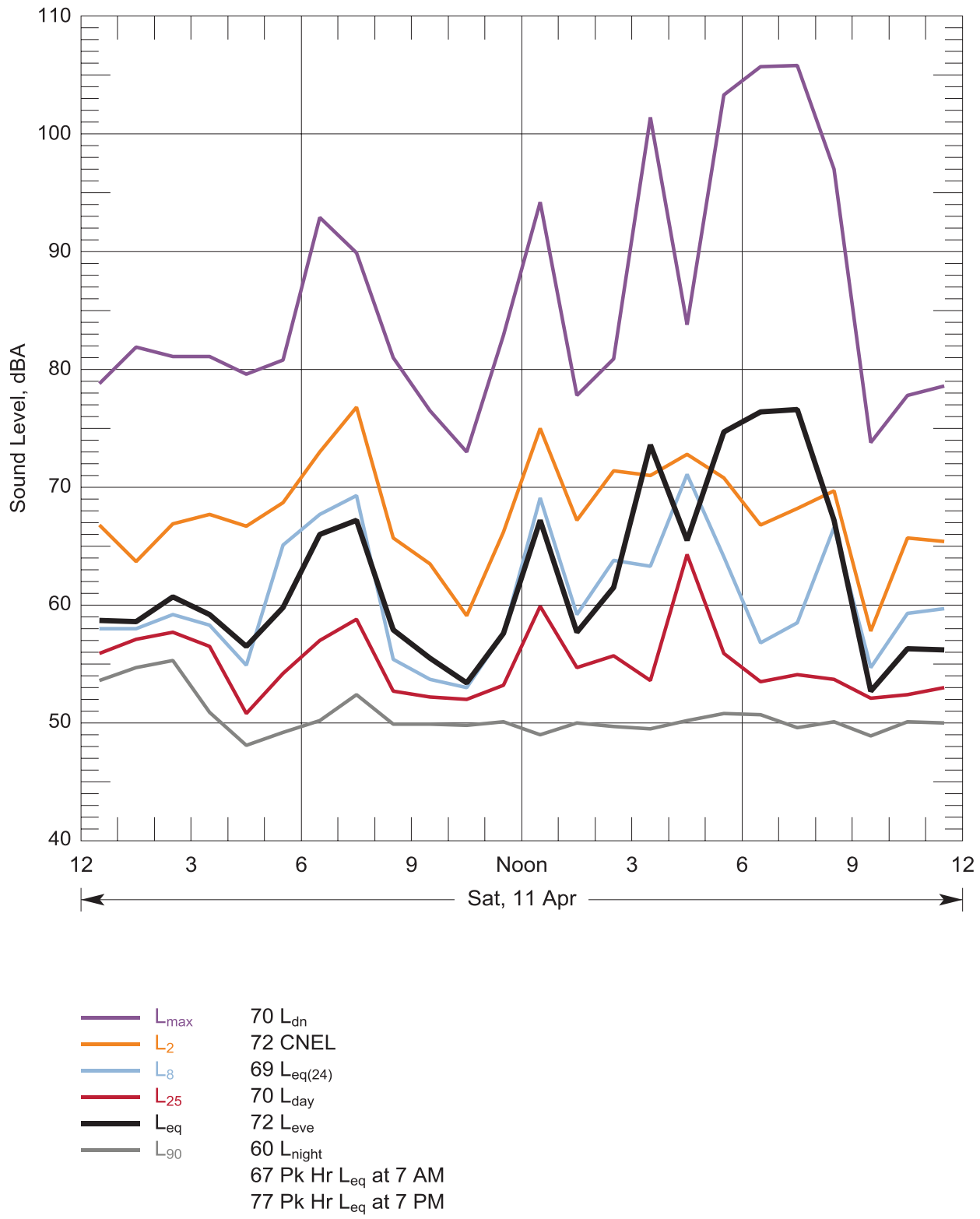

Figure 34: Hourly statistical summary of noise levels measured at Location 4B – 3900 Kuper Rd, Centralia on 11 Apr, 2015 and daily-average descriptors

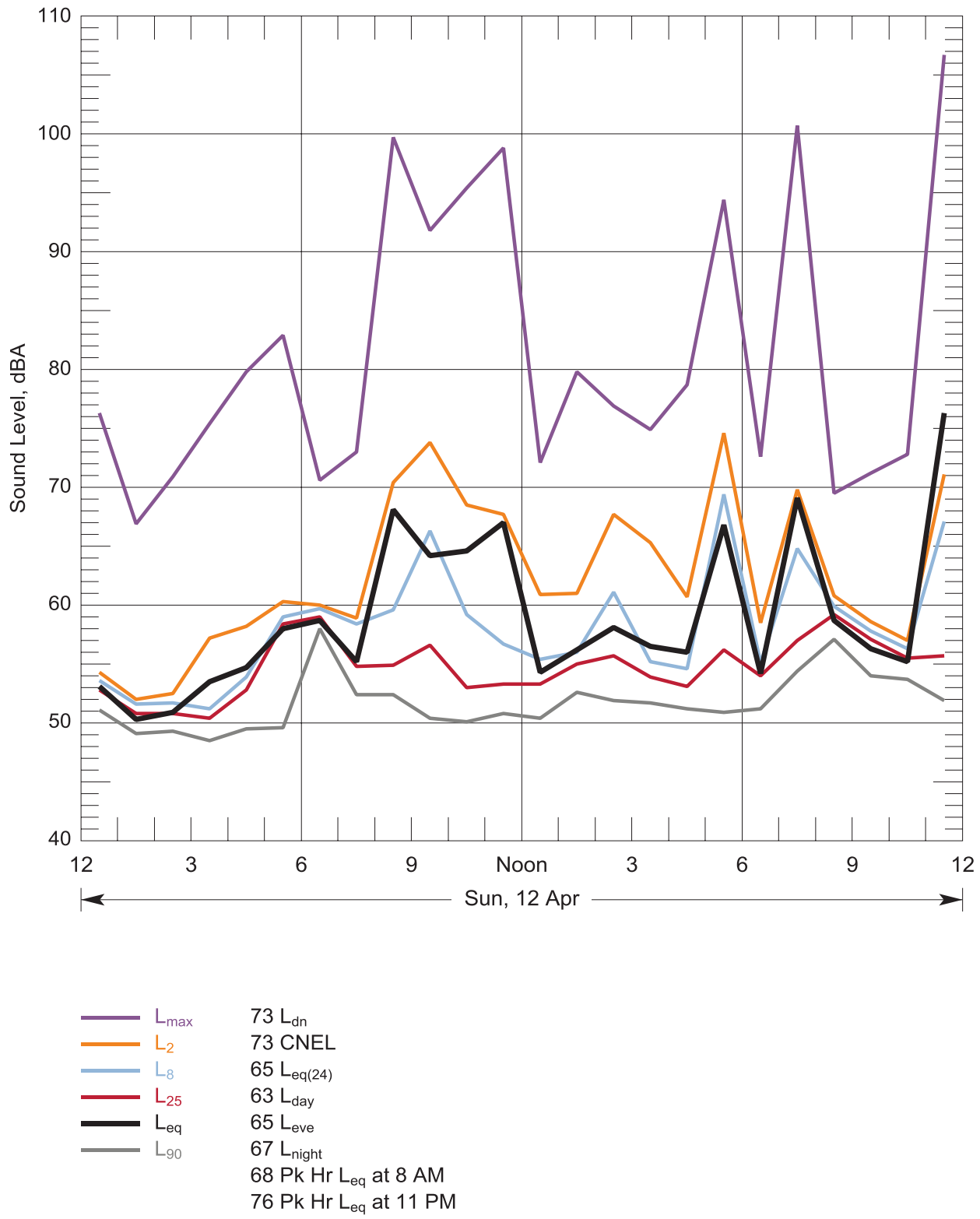

Figure 35: Hourly statistical summary of noise levels measured at Location 4B – 3900 Kuper Rd, Centralia on 12 Apr, 2015 and daily-average descriptors

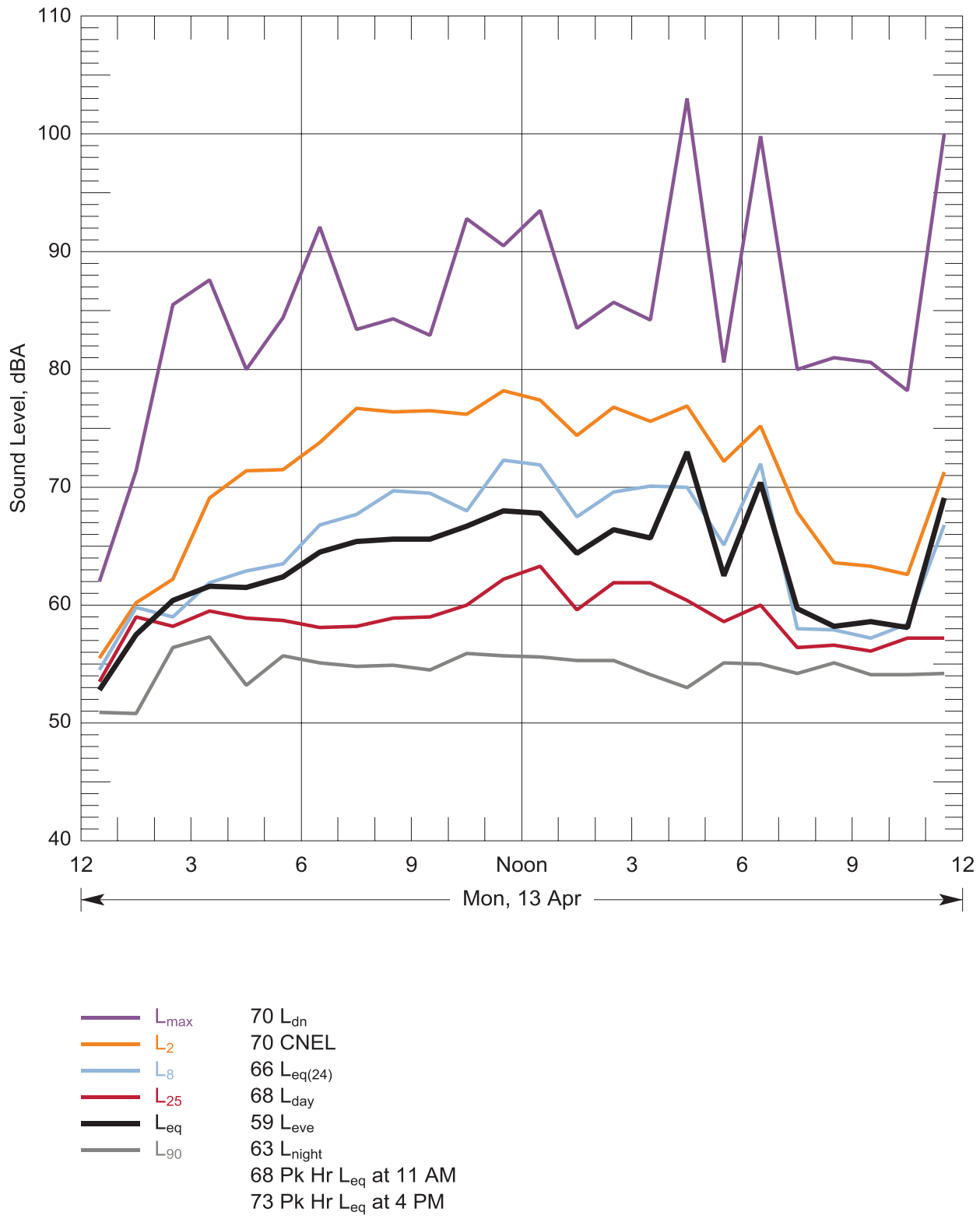

Figure 36: Hourly statistical summary of noise levels measured at Location 4B – 3900 Kuper Rd, Centralia on 13 Apr, 2015 and daily-average descriptors

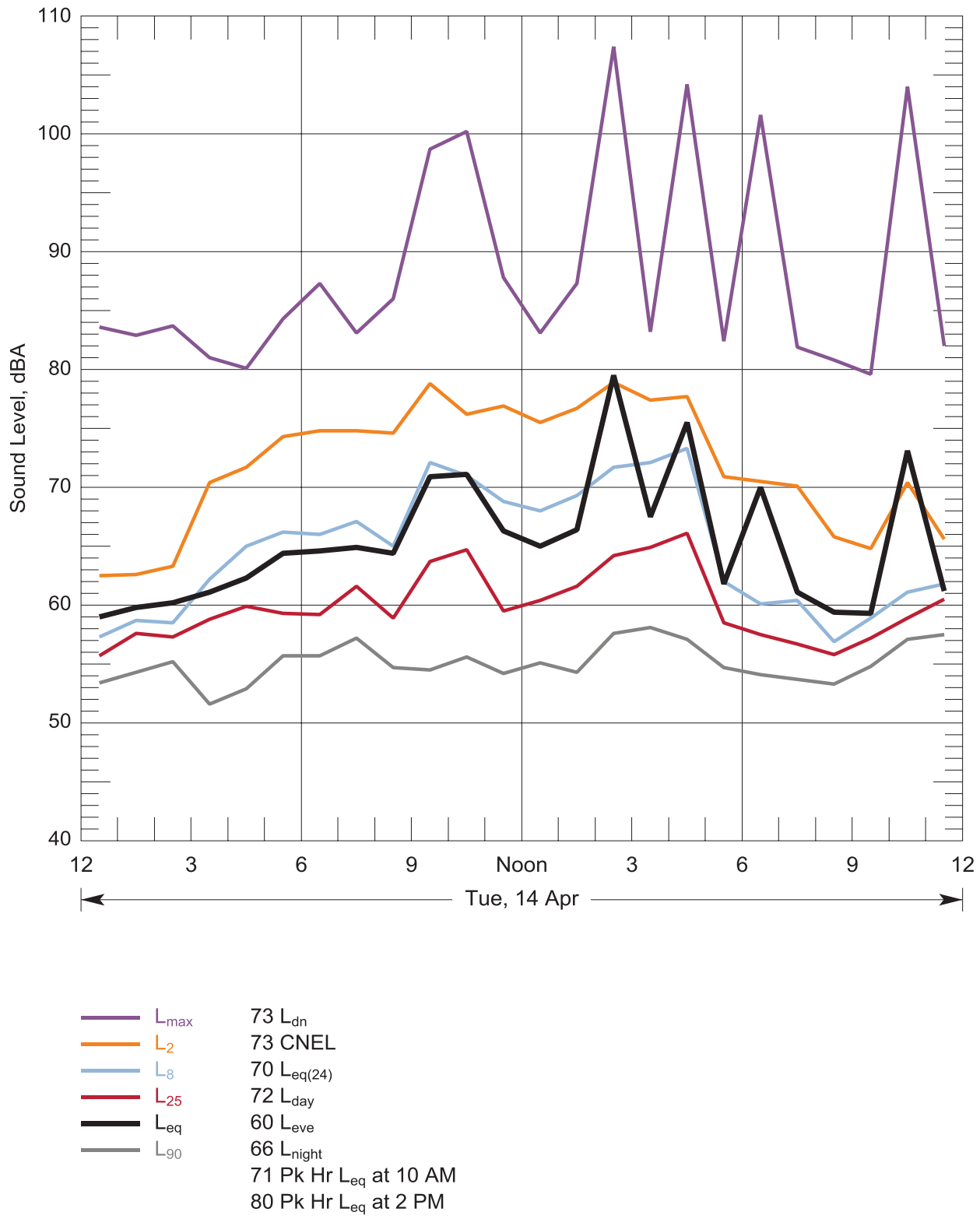

Figure 37: Hourly statistical summary of noise levels measured at Location 4B – 3900 Kuper Rd, Centralia on 14 Apr, 2015 and daily-average descriptors

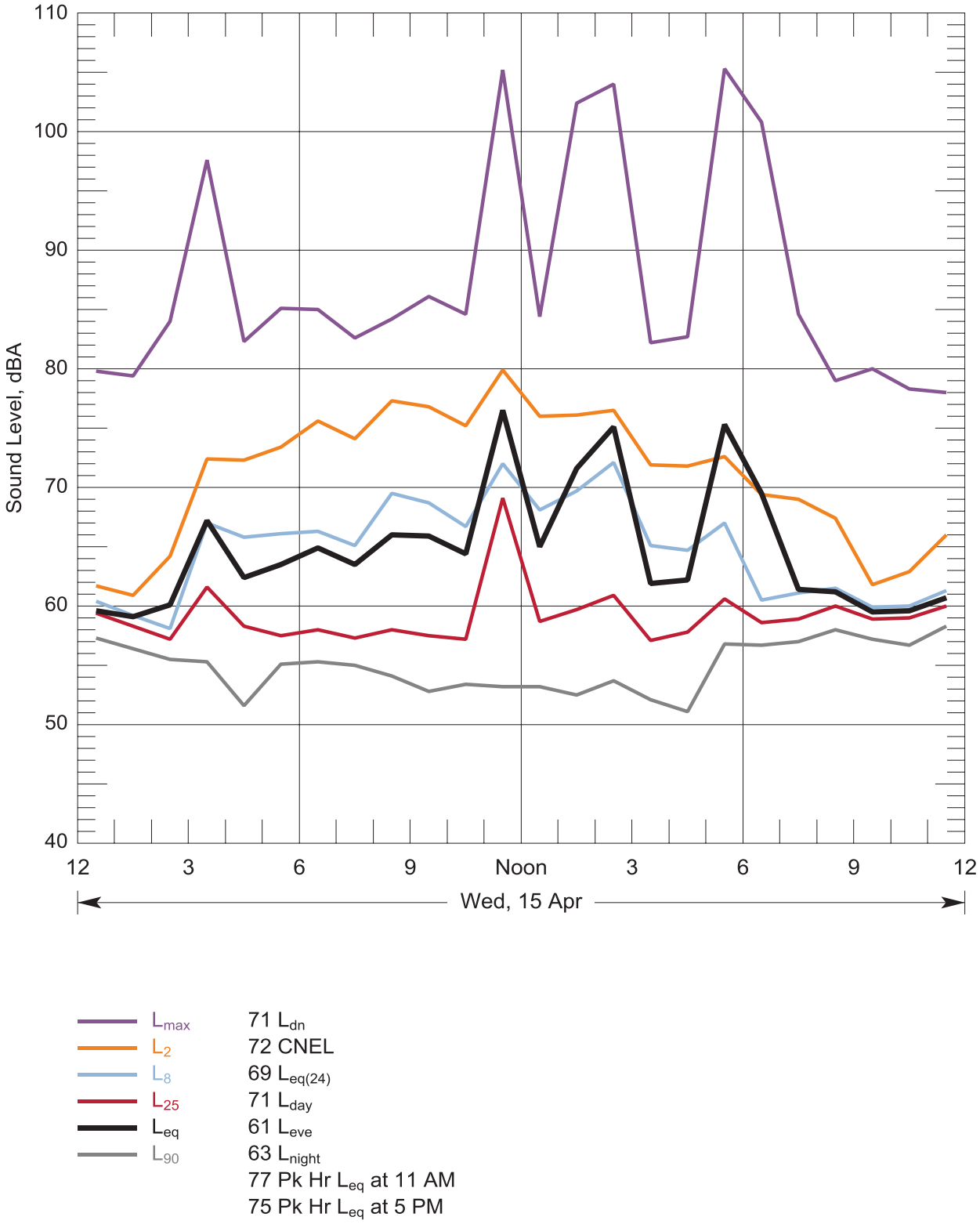

Figure 38: Hourly statistical summary of noise levels measured at Location 4B – 3900 Kuper Rd, Centralia on 15 Apr, 2015 and daily-average descriptors

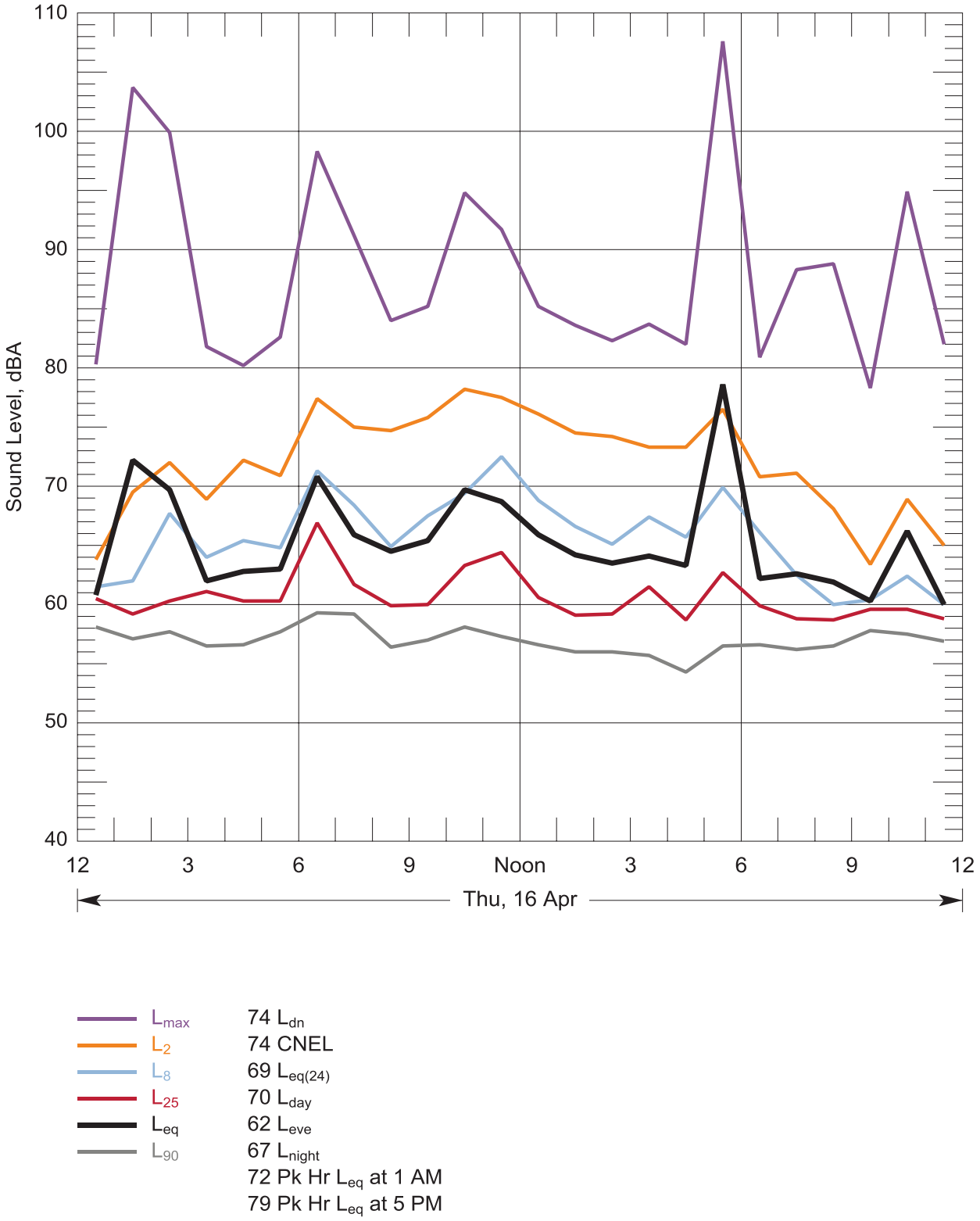

Figure 39: Hourly statistical summary of noise levels measured at Location 4B – 3900 Kuper Rd, Centralia on 16 Apr, 2015 and daily-average descriptors

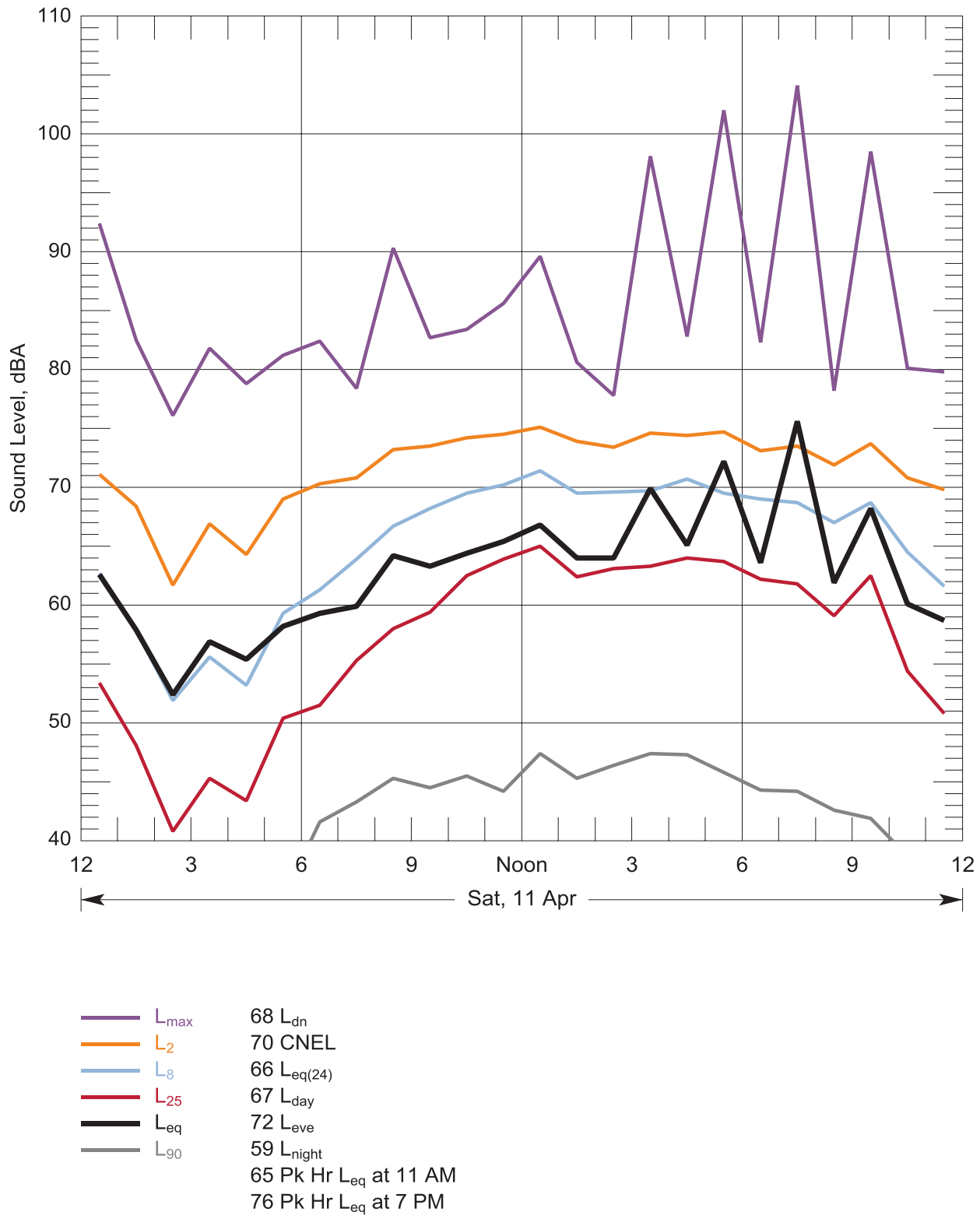

Figure 40: Hourly statistical summary of noise levels measured at Location 5 Alt – Old Hwy 9 & Tea St. SW, Rochester on 11 Apr, 2015 and daily-average descriptors

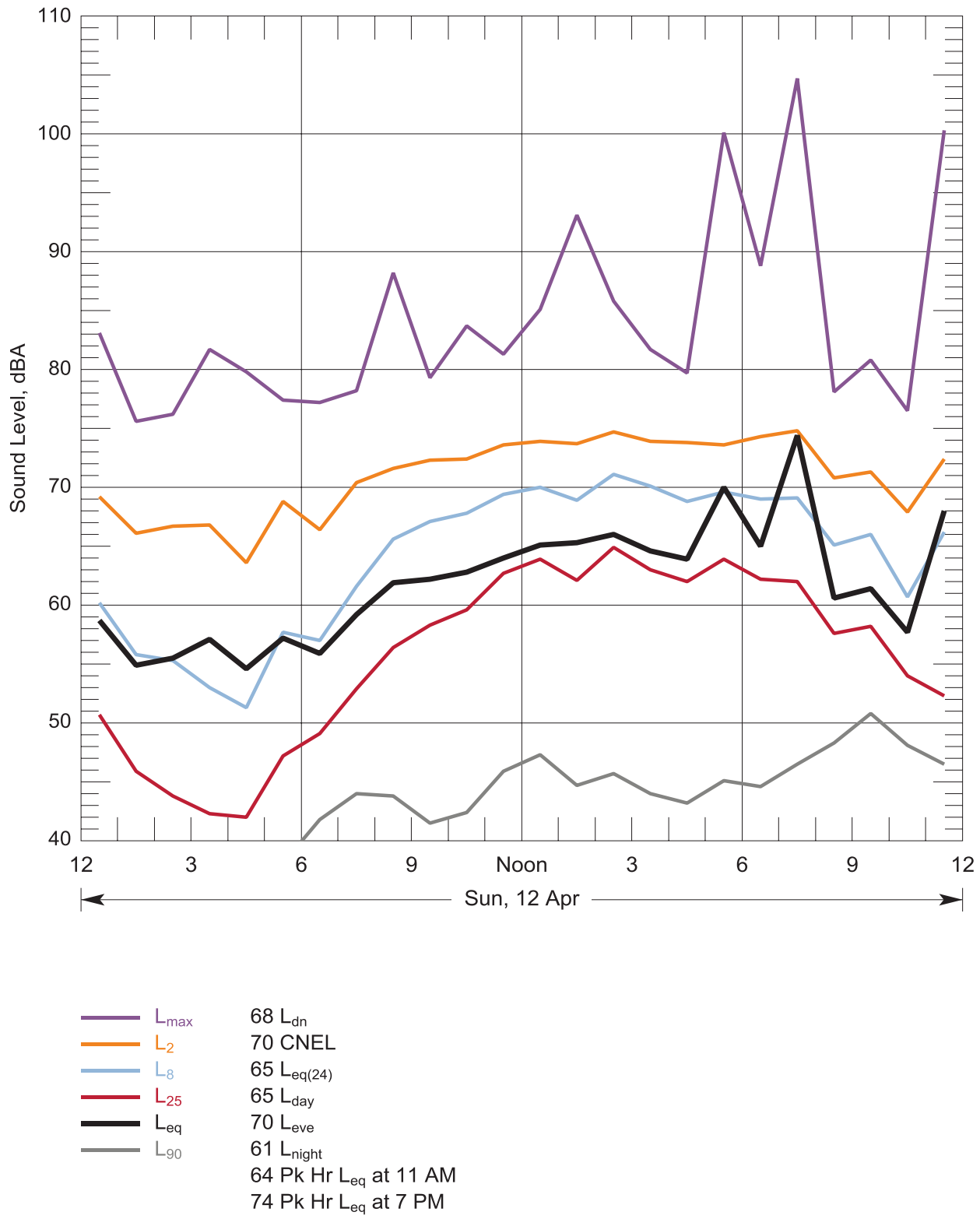

Figure 41: Hourly statistical summary of noise levels measured at Location 5 Alt – Old Hwy 9 & Tea St. SW, Rochester on 12 Apr, 2015 and daily-average descriptors

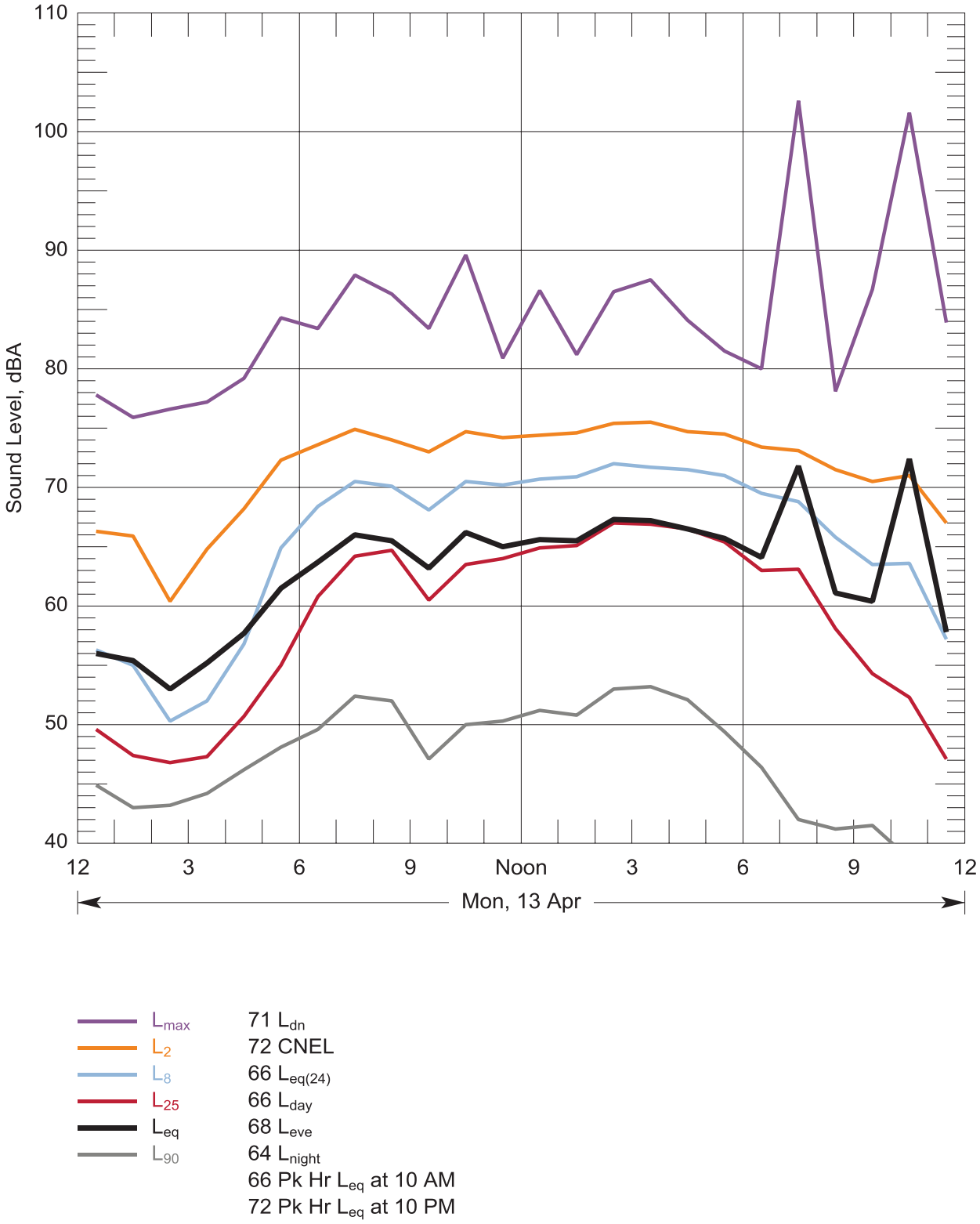

Figure 42: Hourly statistical summary of noise levels measured at Location 5 Alt – Old Hwy 9 & Tea St. SW, Rochester on 13 Apr, 2015 and daily-average descriptors

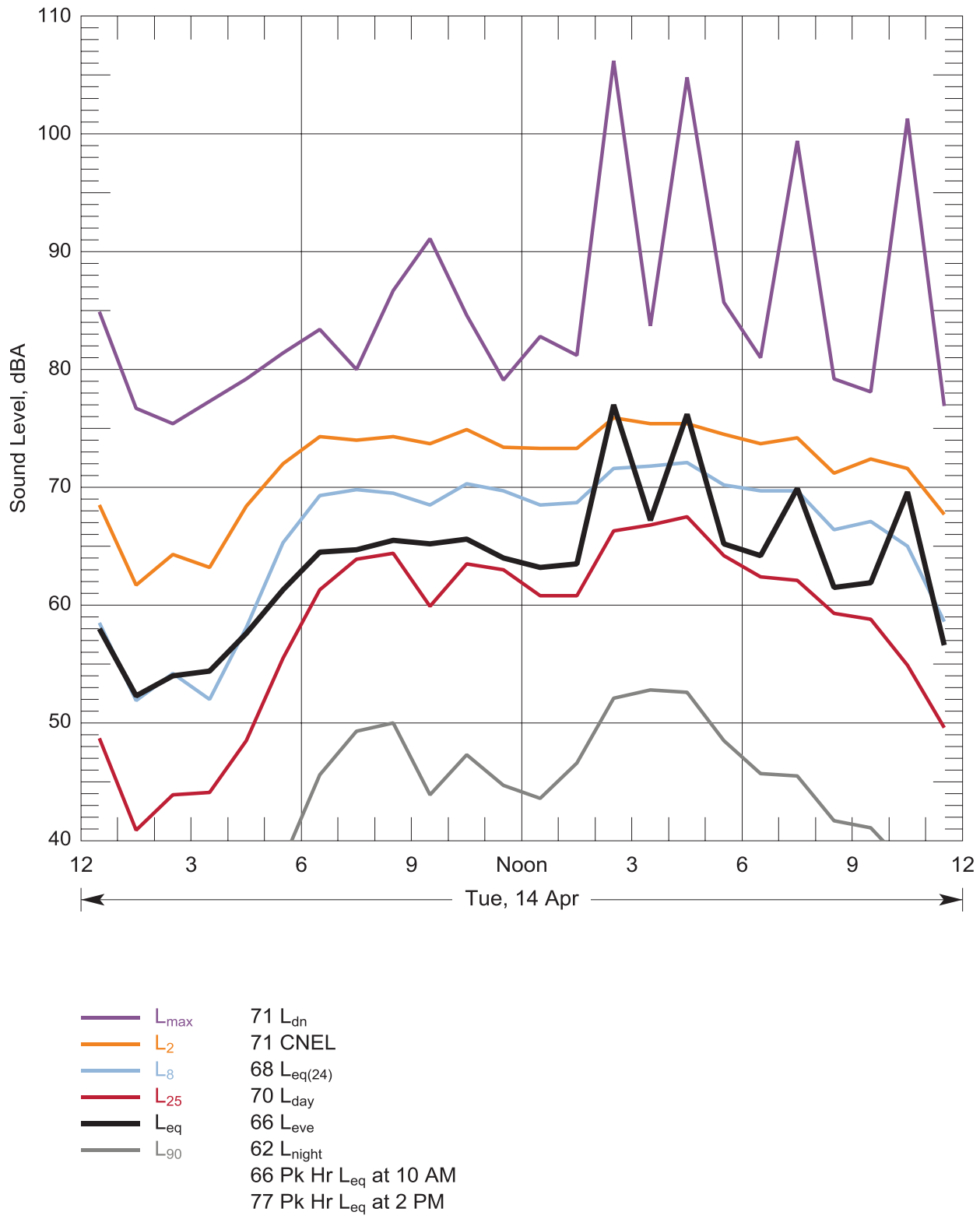

Figure 43: Hourly statistical summary of noise levels measured at Location 5 Alt – Old Hwy 9 & Tea St. SW, Rochester on 14 Apr, 2015 and daily-average descriptors

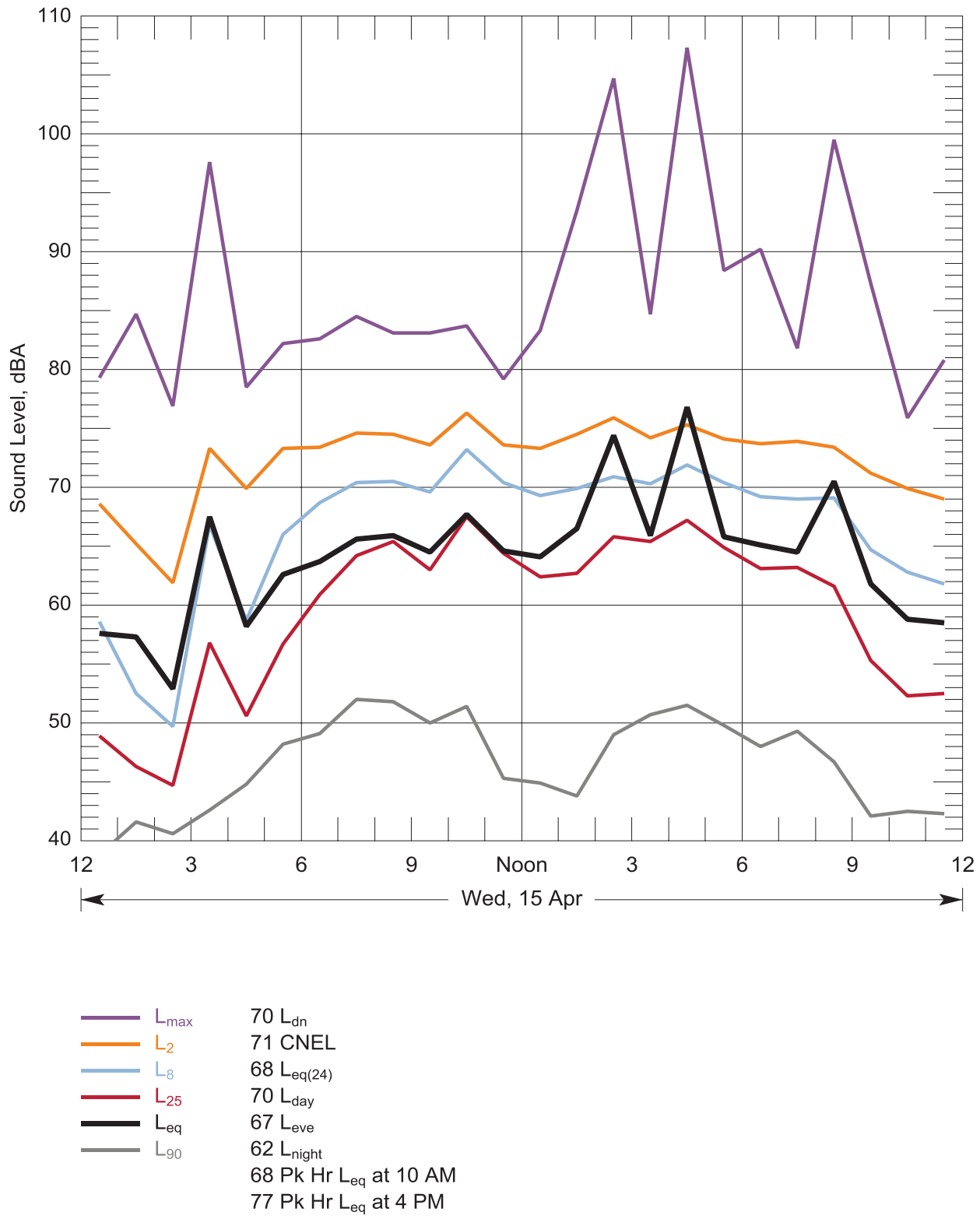

Figure 44: Hourly statistical summary of noise levels measured at Location 5 Alt – Old Hwy 9 & Tea St. SW, Rochester on 15 Apr, 2015 and daily-average descriptors

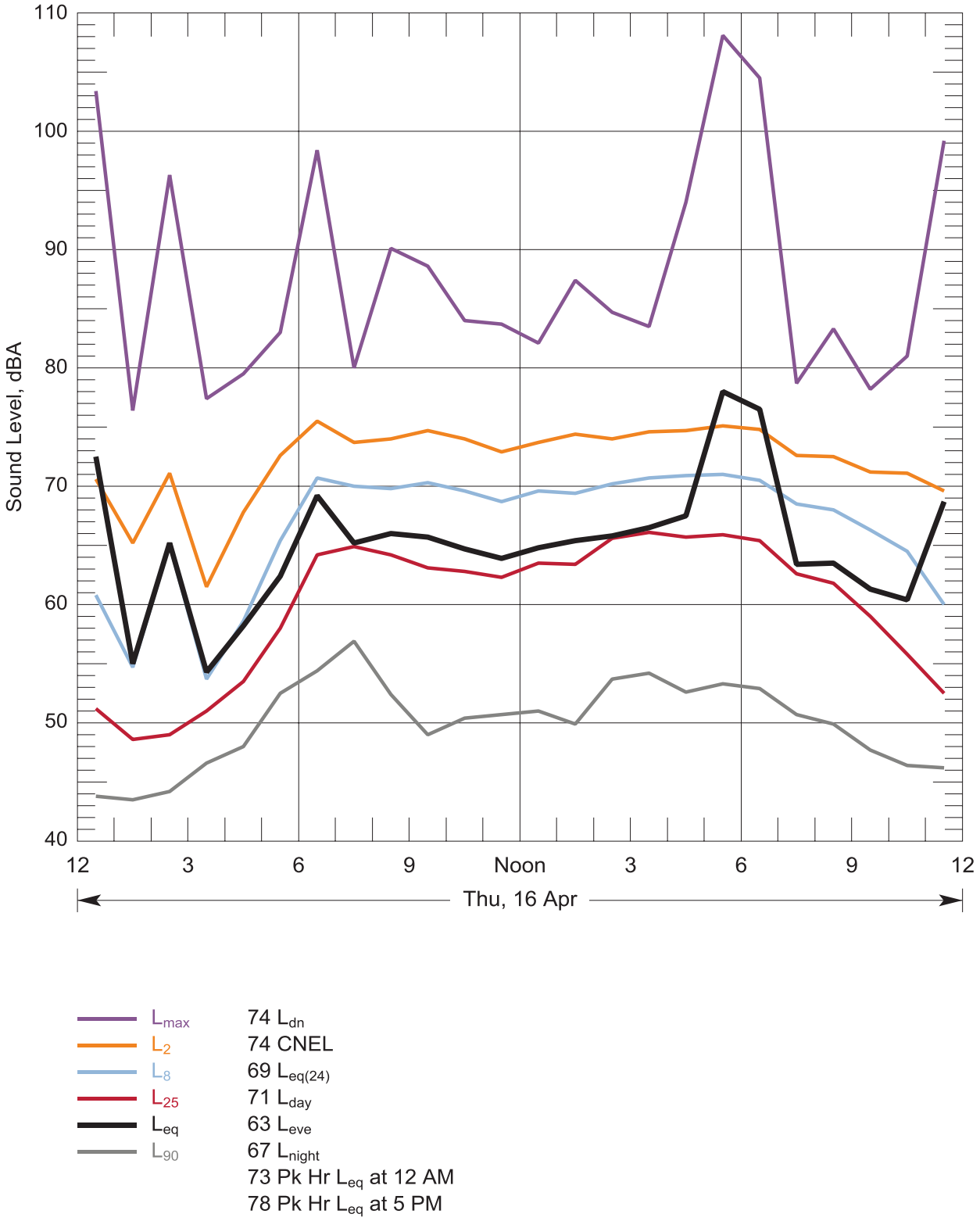

Figure 45: Hourly statistical summary of noise levels measured at Location 5 Alt – Old Hwy 9 & Tea St. SW, Rochester on 16 Apr, 2015 and daily-average descriptors

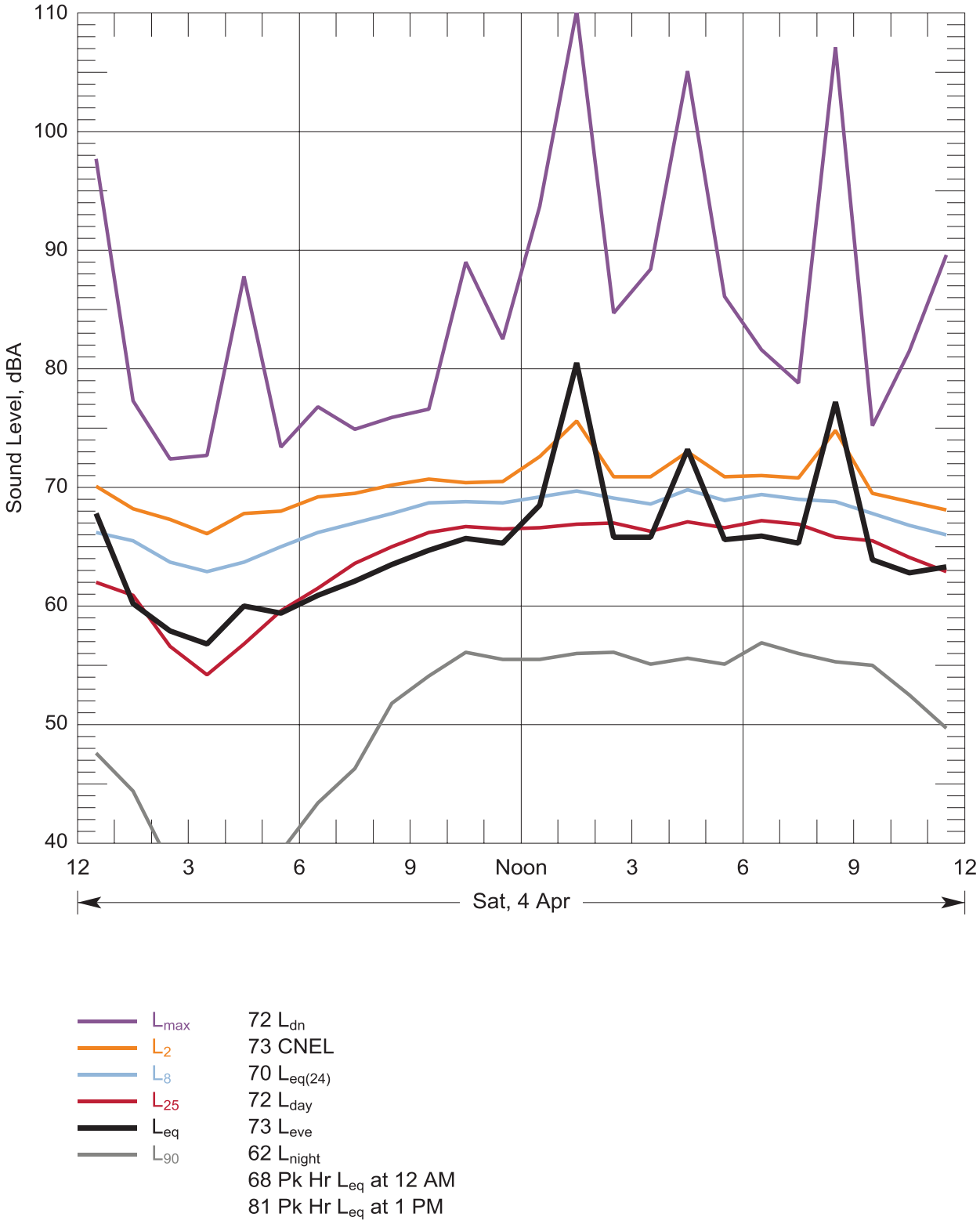

Figure 46: Hourly statistical summary of noise levels measured at Location 6 – 19318 Grand Mound Way, Rochester on 04 Apr, 2015 and daily-average descriptors

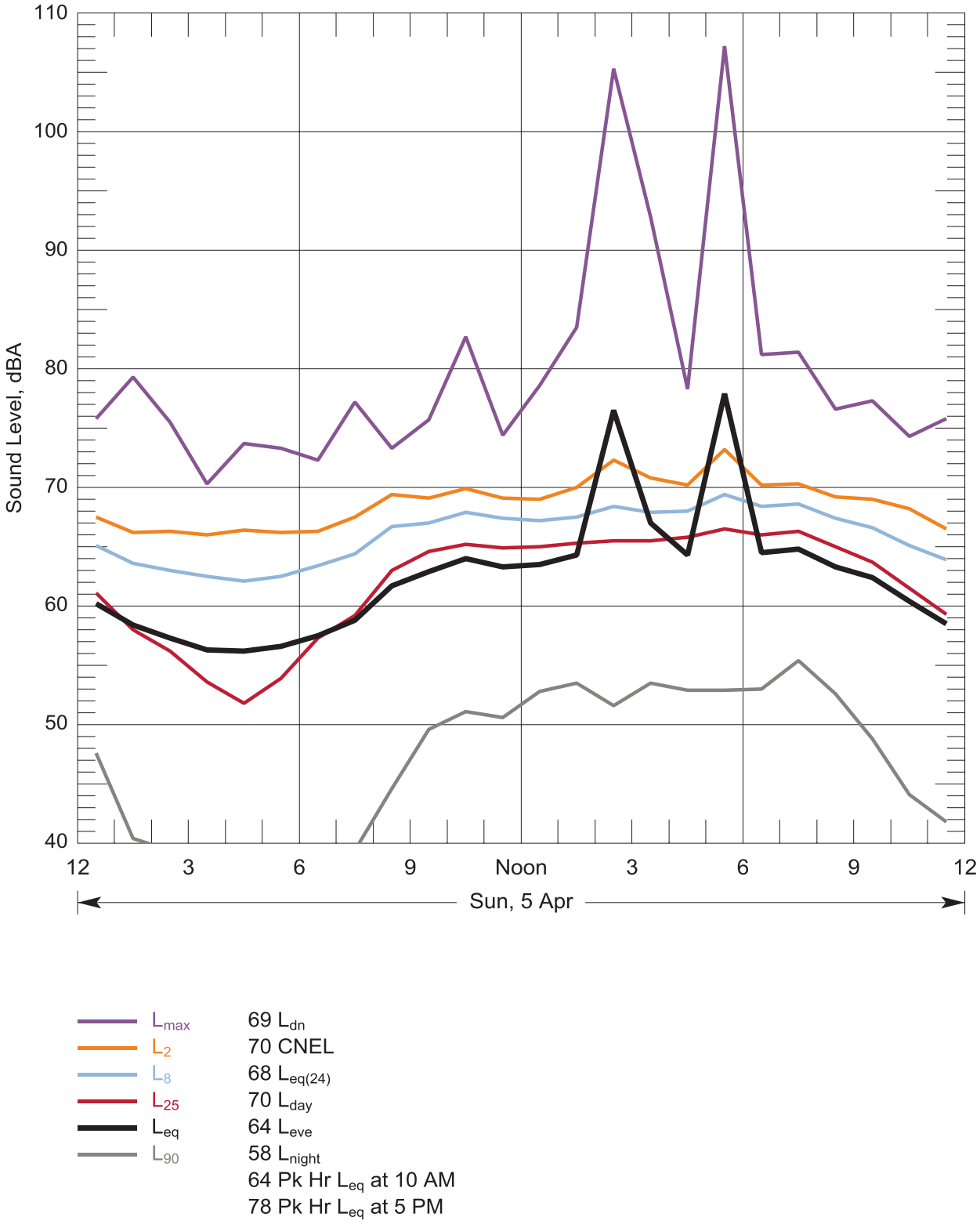

Figure 47: Hourly statistical summary of noise levels measured at Location 6 – 19318 Grand Mound Way, Rochester on 05 Apr, 2015 and daily-average descriptors

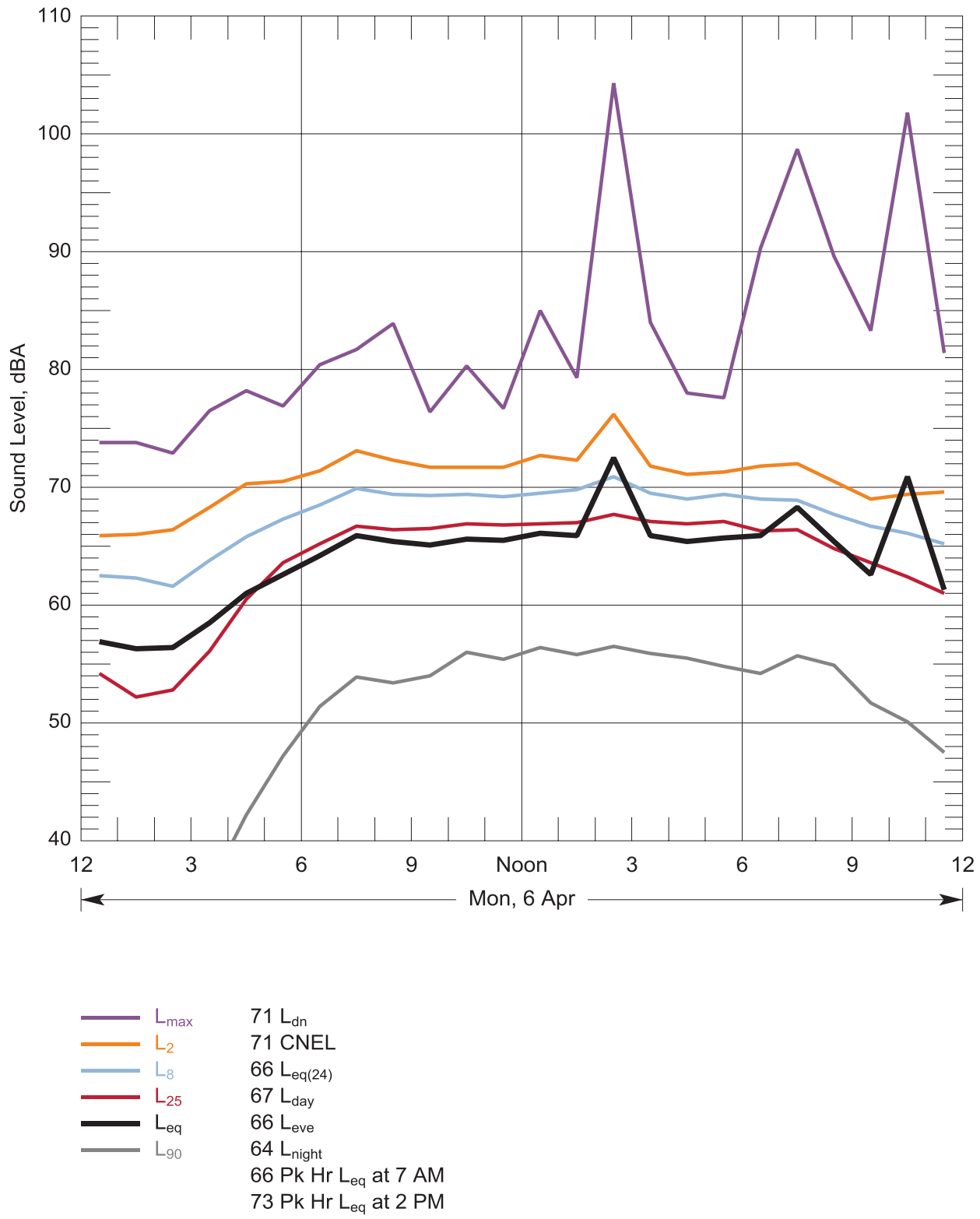

Figure 48: Hourly statistical summary of noise levels measured at Location 6 – 19318 Grand Mound Way, Rochester on 06 Apr, 2015 and daily-average descriptors

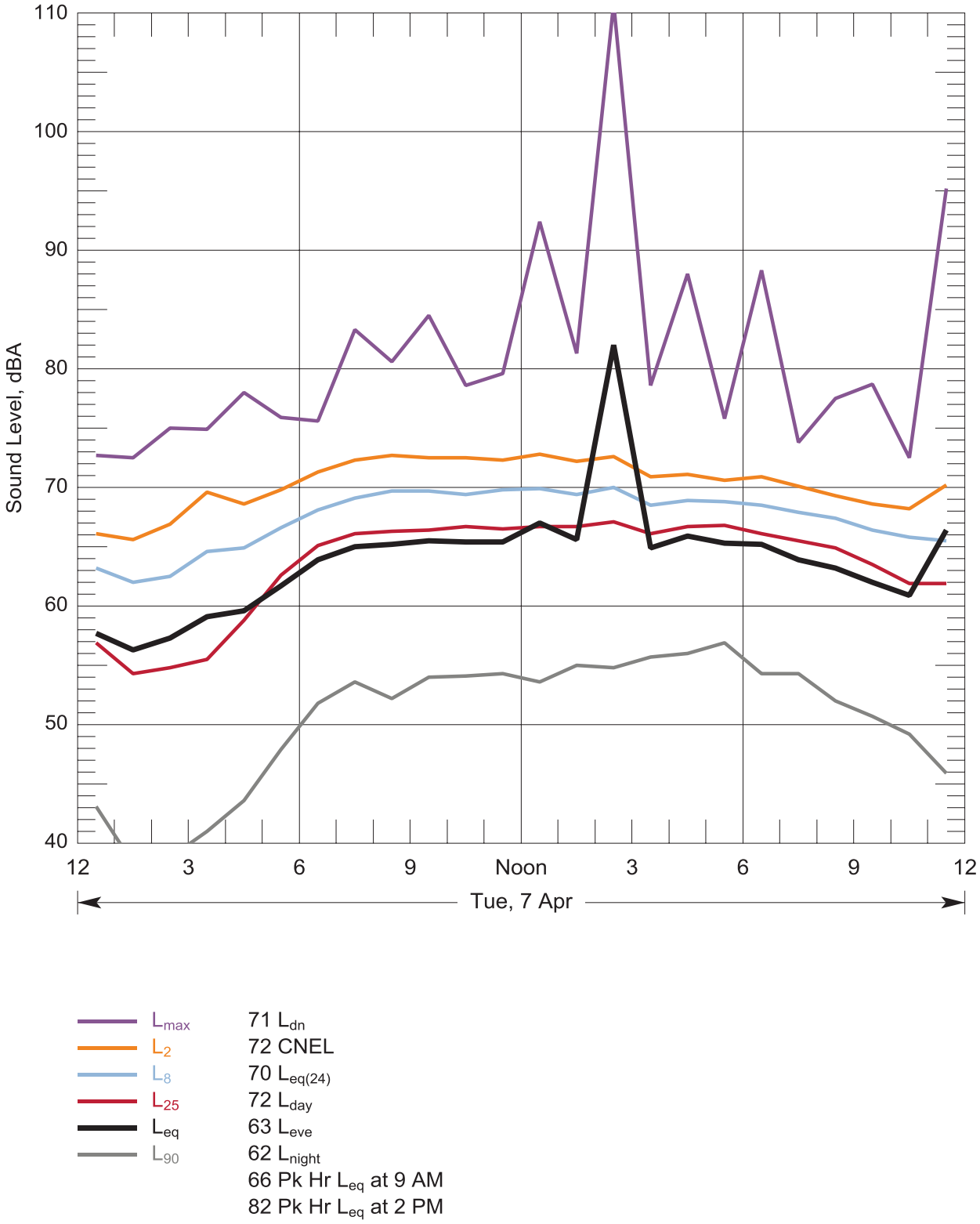

Figure 49: Hourly statistical summary of noise levels measured at Location 6 – 19318 Grand Mound Way, Rochester on 07 Apr, 2015 and daily-average descriptors

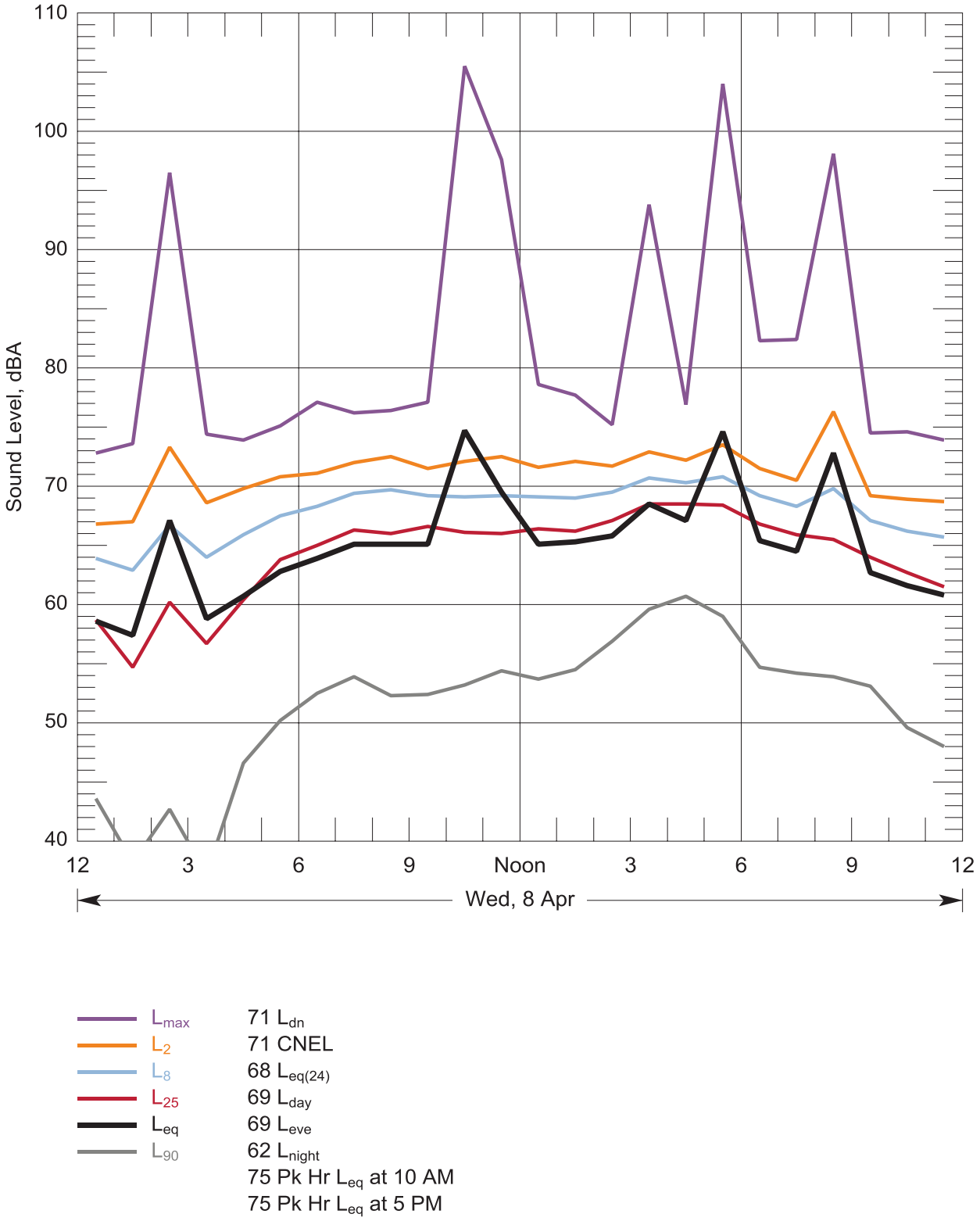

Figure 50: Hourly statistical summary of noise levels measured at Location 6 – 19318 Grand Mound Way, Rochester on 08 Apr, 2015 and daily-average descriptors

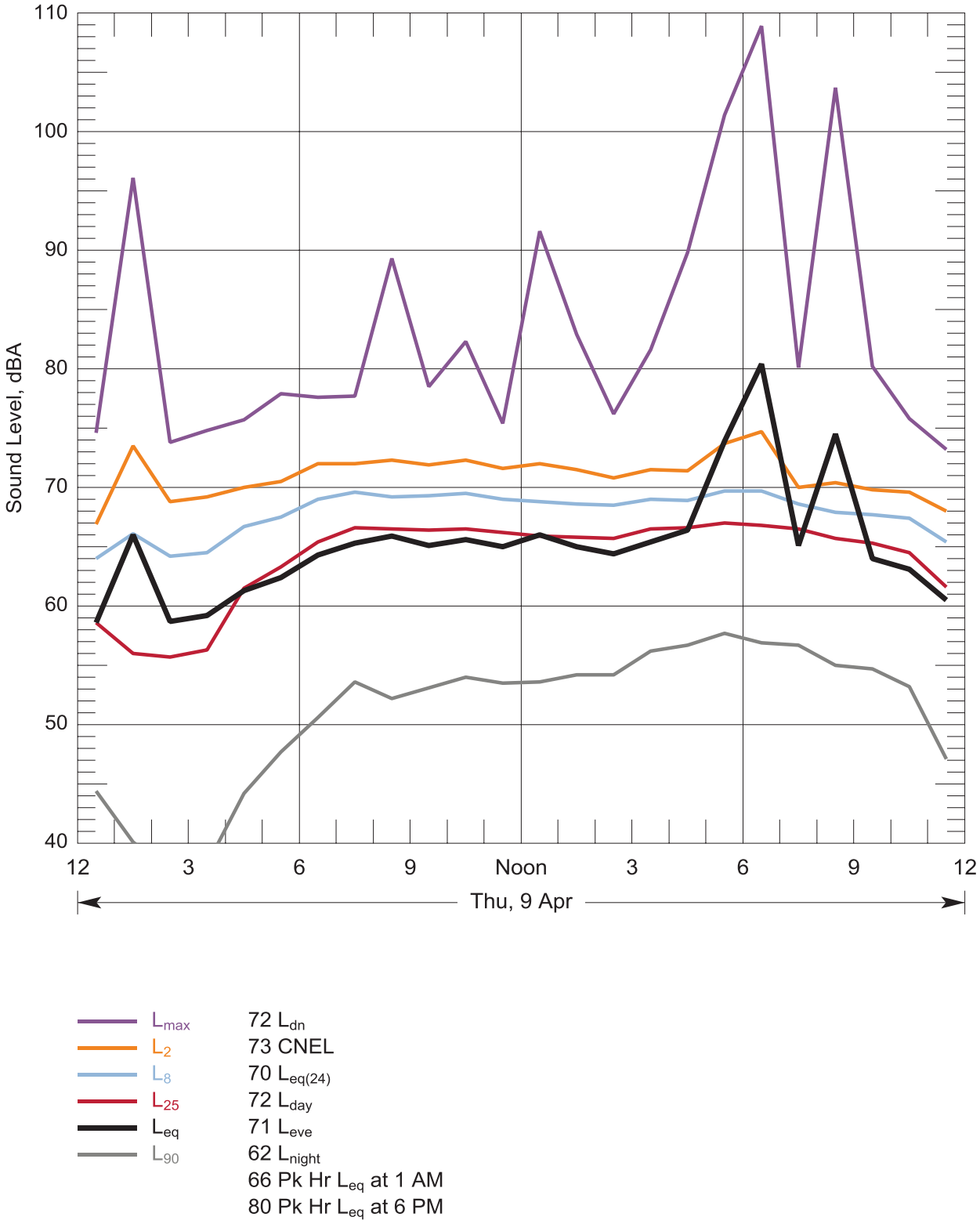

Figure 51: Hourly statistical summary of noise levels measured at Location 6 – 19318 Grand Mound Way, Rochester on 09 Apr, 2015 and daily-average descriptors

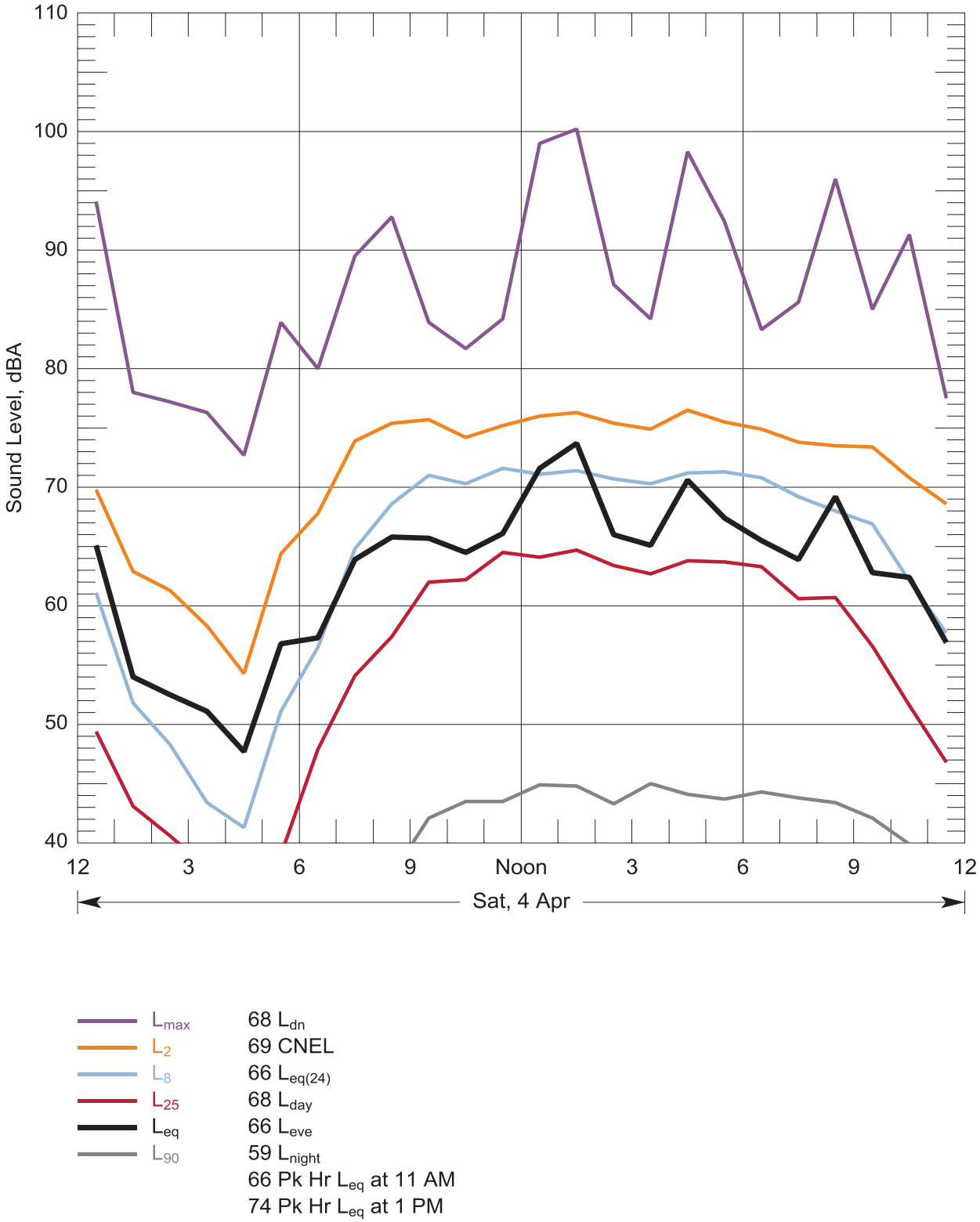

Figure 52: Hourly statistical summary of noise levels measured at Location 8 - 180th & Little Rock, Rochester on 04 Apr, 2015 and daily-average descriptors

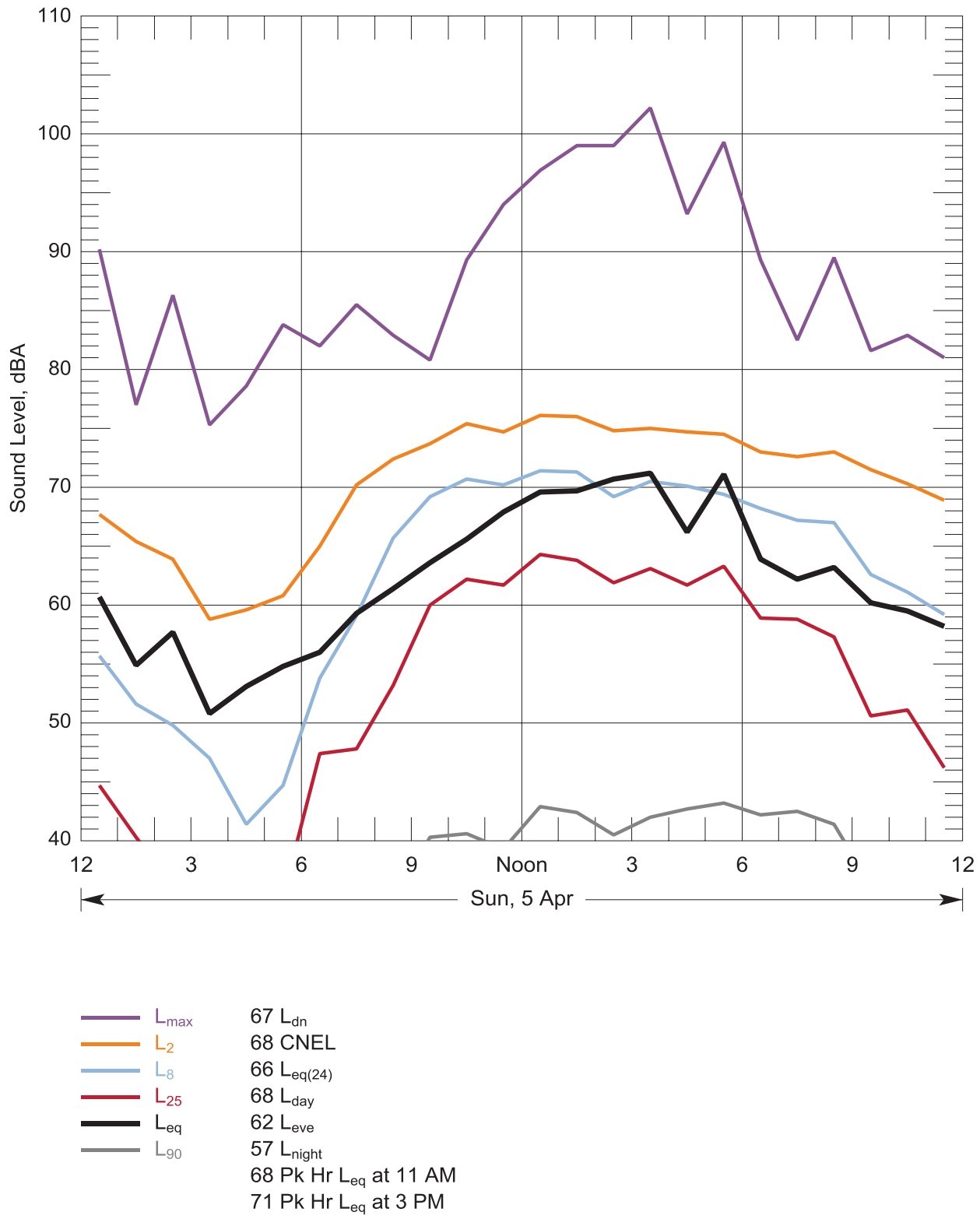

Figure 53: Hourly statistical summary of noise levels measured at Location 8 - 180th & Little Rock, Rochester on 05 Apr, 2015 and daily-average descriptors

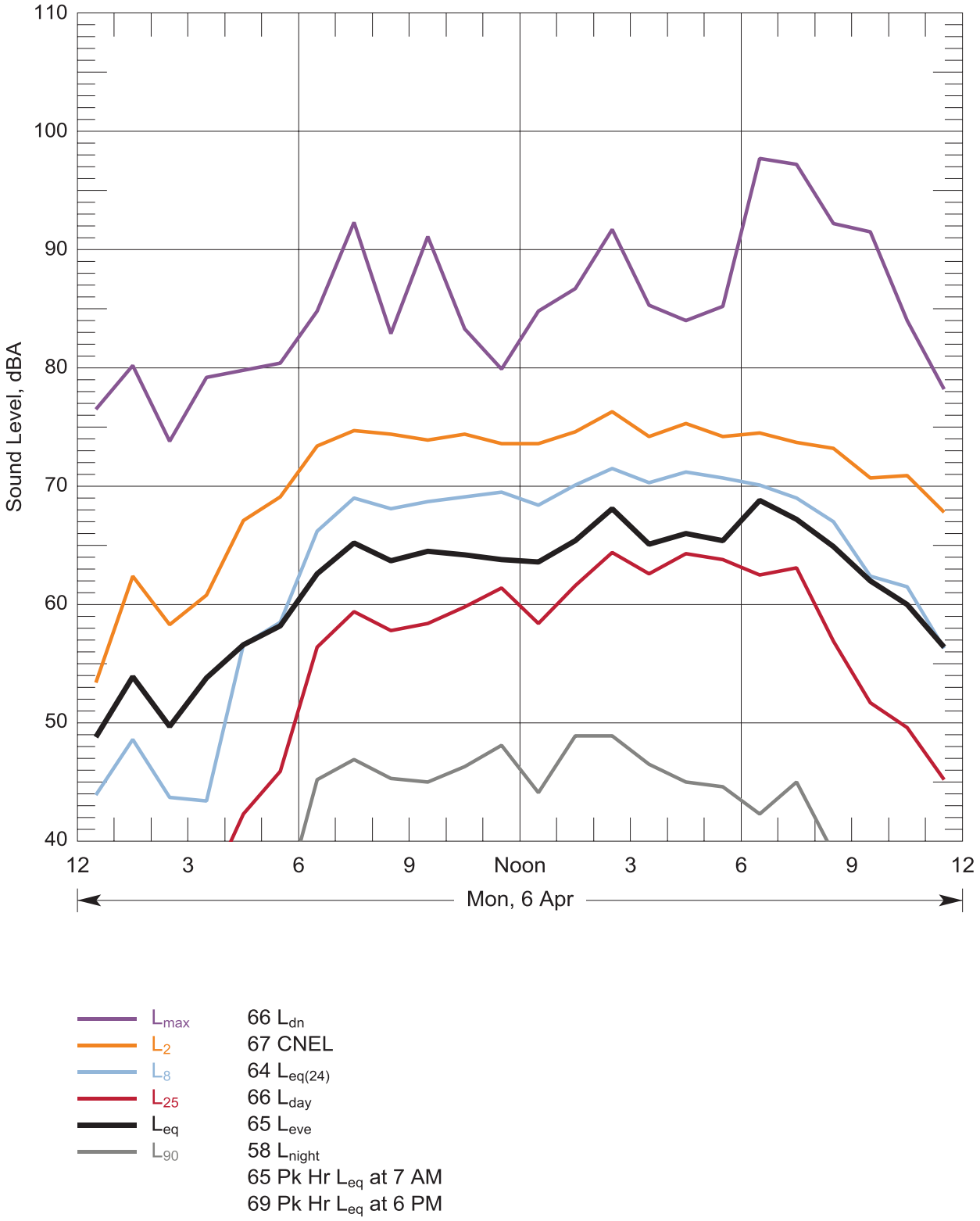

Figure 54: Hourly statistical summary of noise levels measured at Location 8 - 180th & Little Rock, Rochester on 06 Apr, 2015 and daily-average descriptors

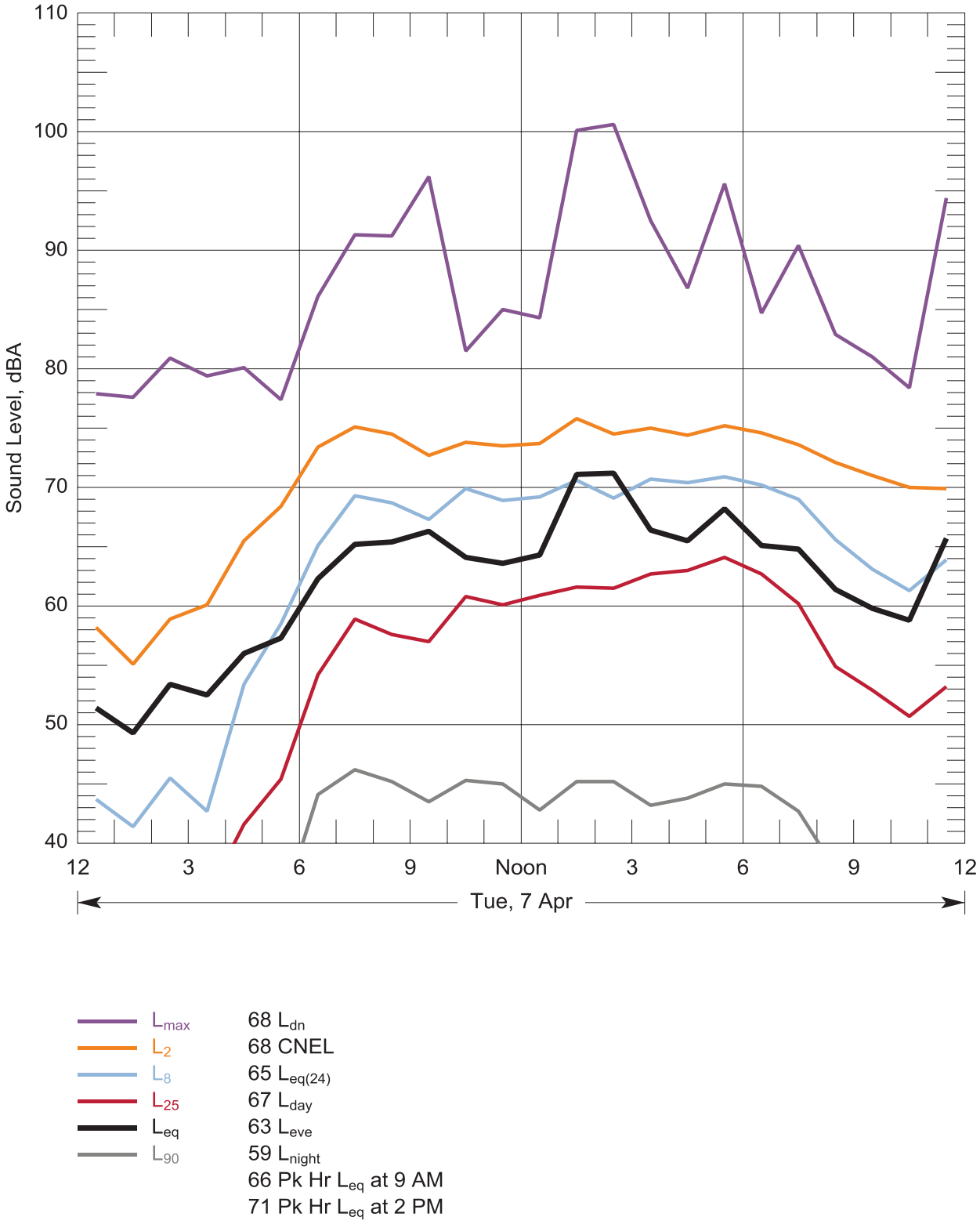

Figure 55: Hourly statistical summary of noise levels measured at Location 8 - 180th & Little Rock, Rochester on 07 Apr, 2015 and daily-average descriptors

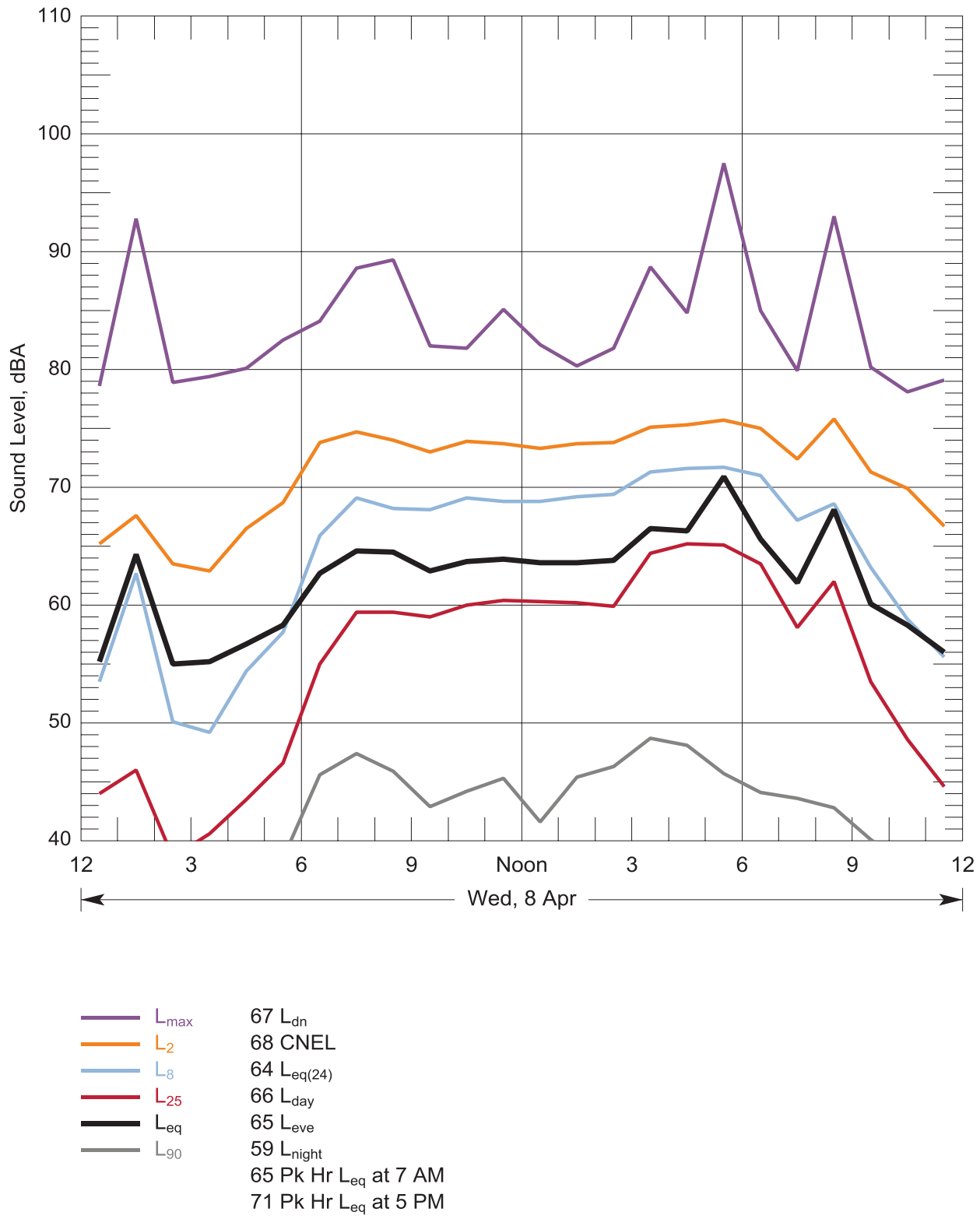

Figure 56: Hourly statistical summary of noise levels measured at Location 8 - 180th & Little Rock, Rochester on 08 Apr, 2015 and daily-average descriptors

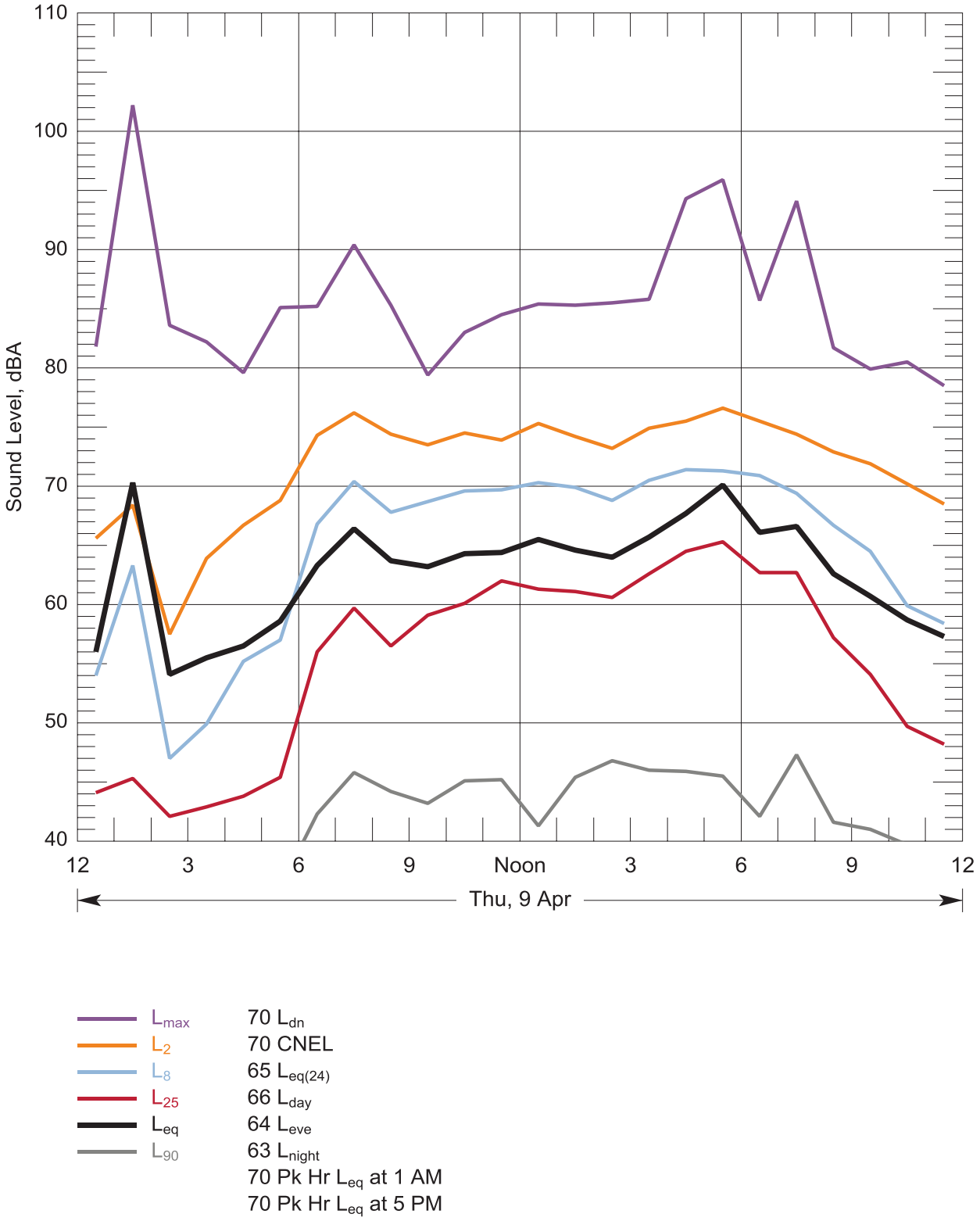

Figure 57: Hourly statistical summary of noise levels measured at Location 8 - 180th & Little Rock, Rochester on 09 Apr, 2015 and daily-average descriptors

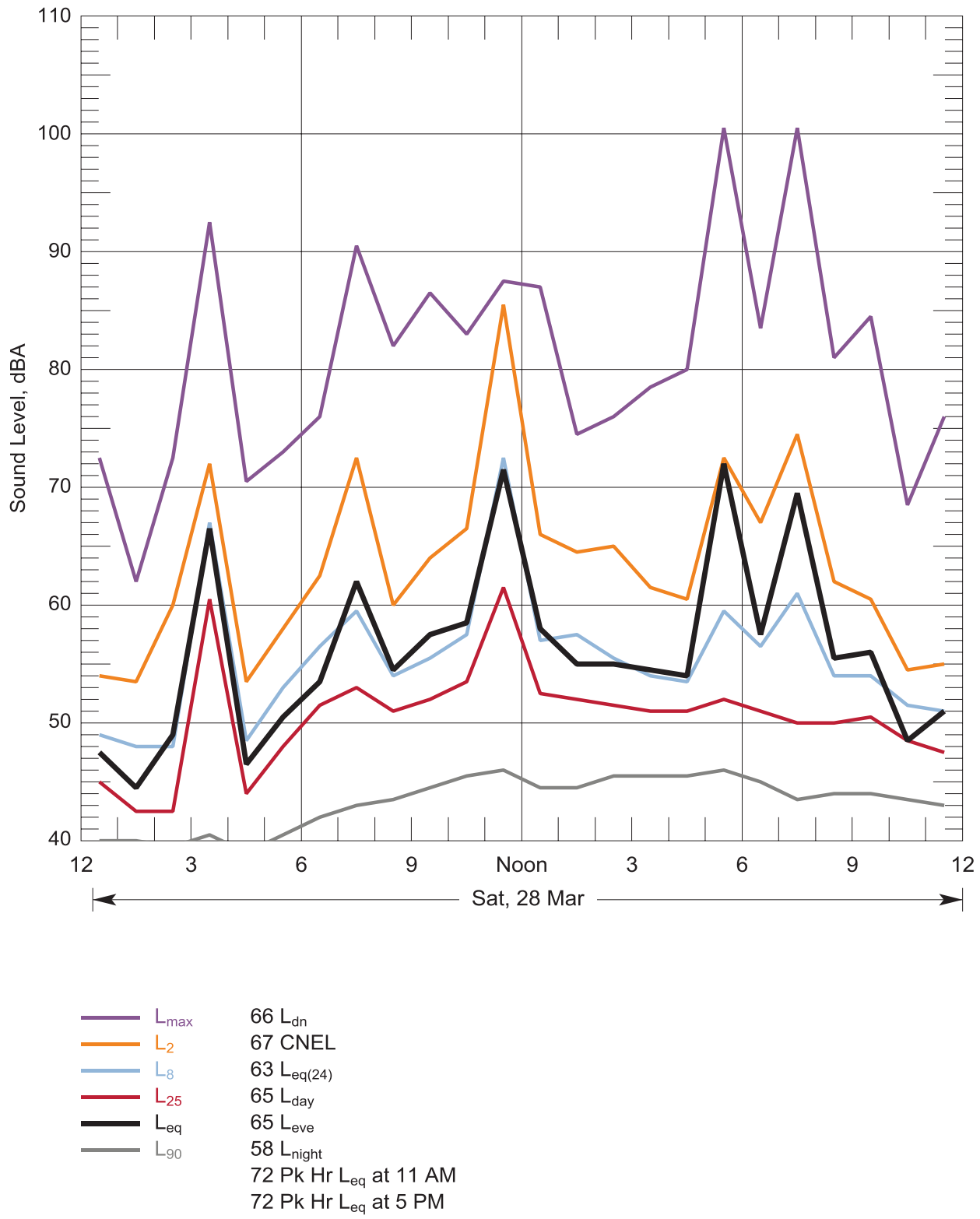

Figure 58: Hourly statistical summary of noise levels measured at Location 9 - 205 Murrey, Oakville on 28 Mar, 2015 and daily-average descriptors

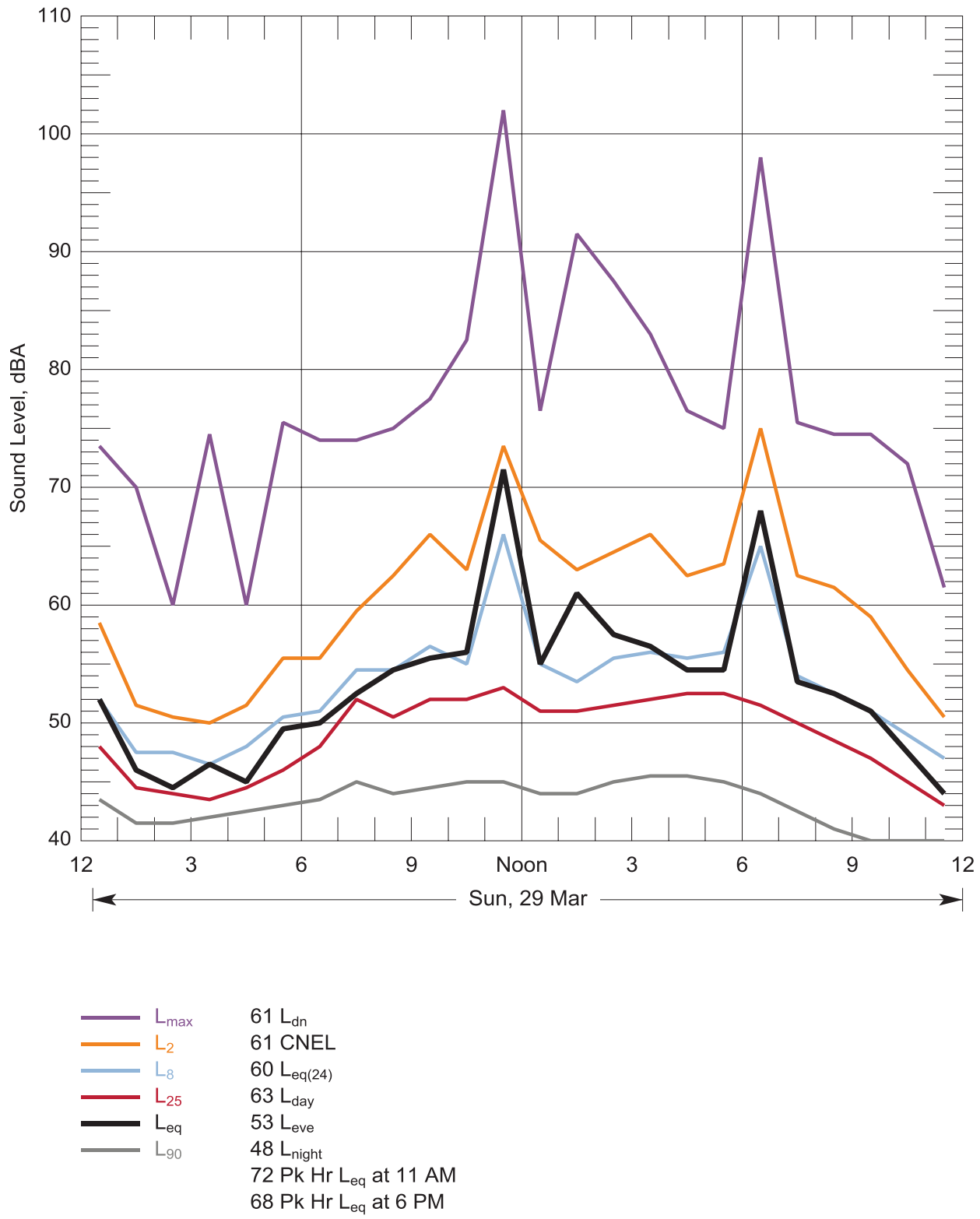

Figure 59: Hourly statistical summary of noise levels measured at Location 9 - 205 Murrey, Oakville on 29 Mar, 2015 and daily-average descriptors

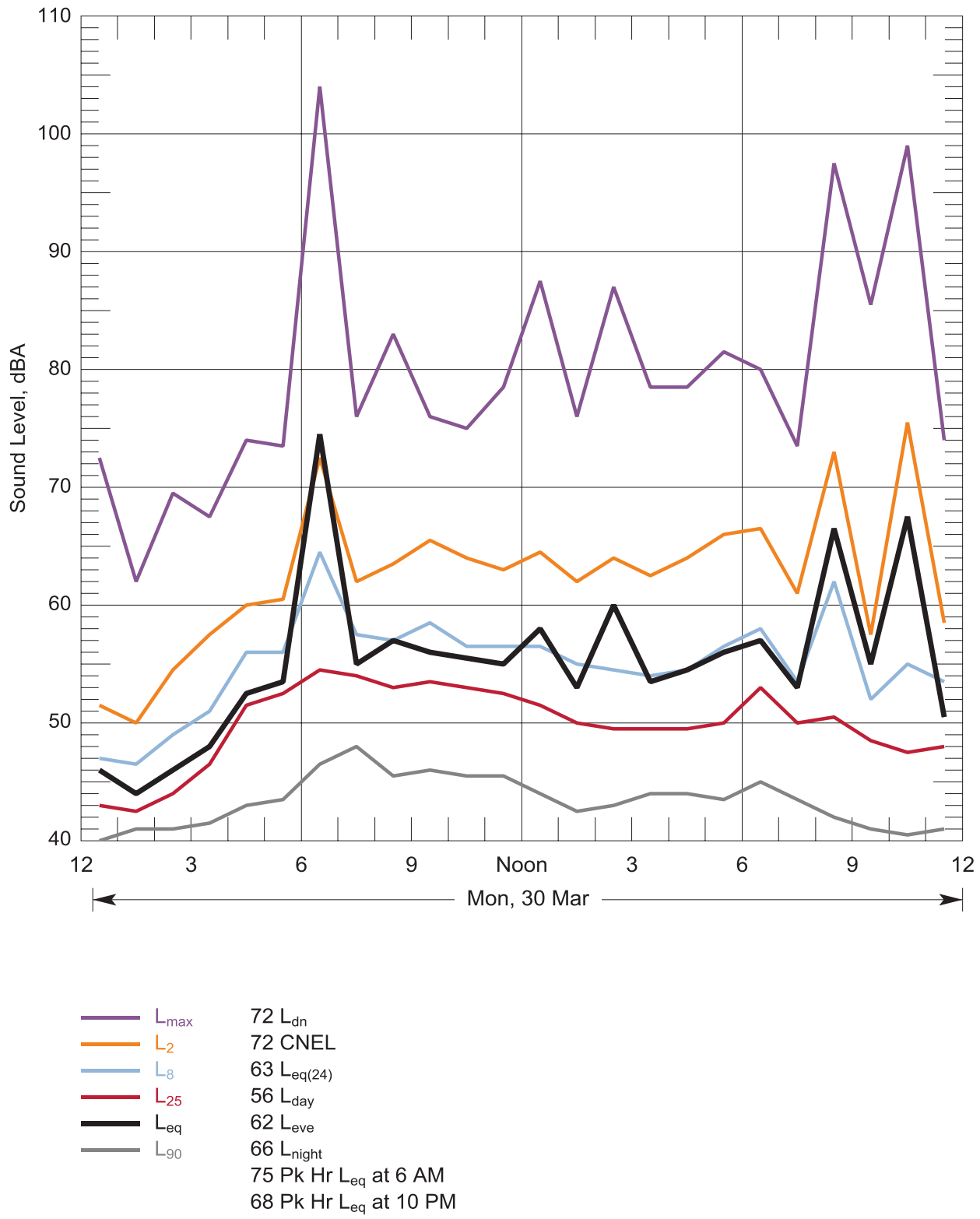

Figure 60: Hourly statistical summary of noise levels measured at Location 9 - 205 Murrey, Oakville on 30 Mar, 2015 and daily-average descriptors

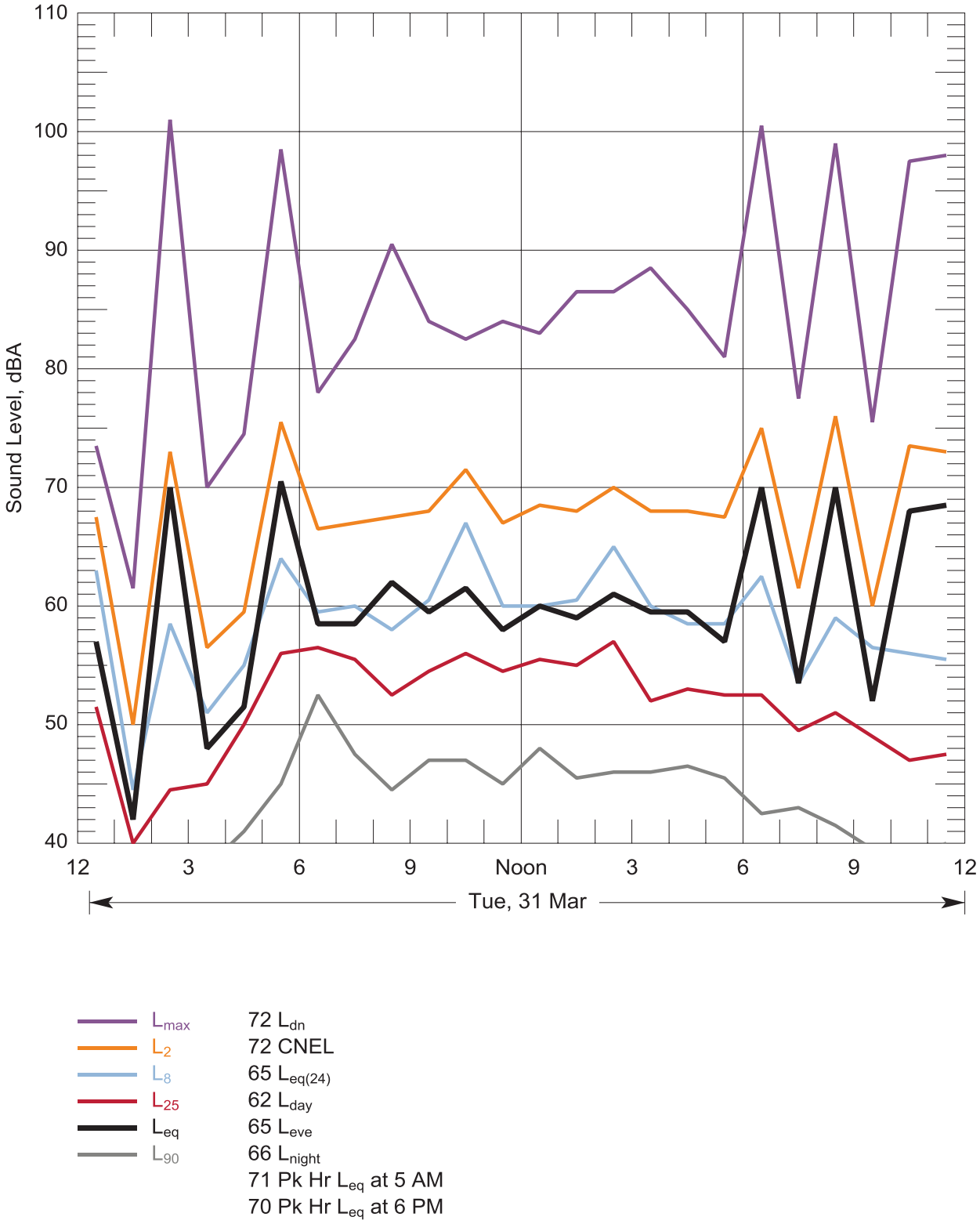

Figure 61: Hourly statistical summary of noise levels measured at Location 9 - 205 Murrey, Oakville on 31 Mar, 2015 and daily-average descriptors

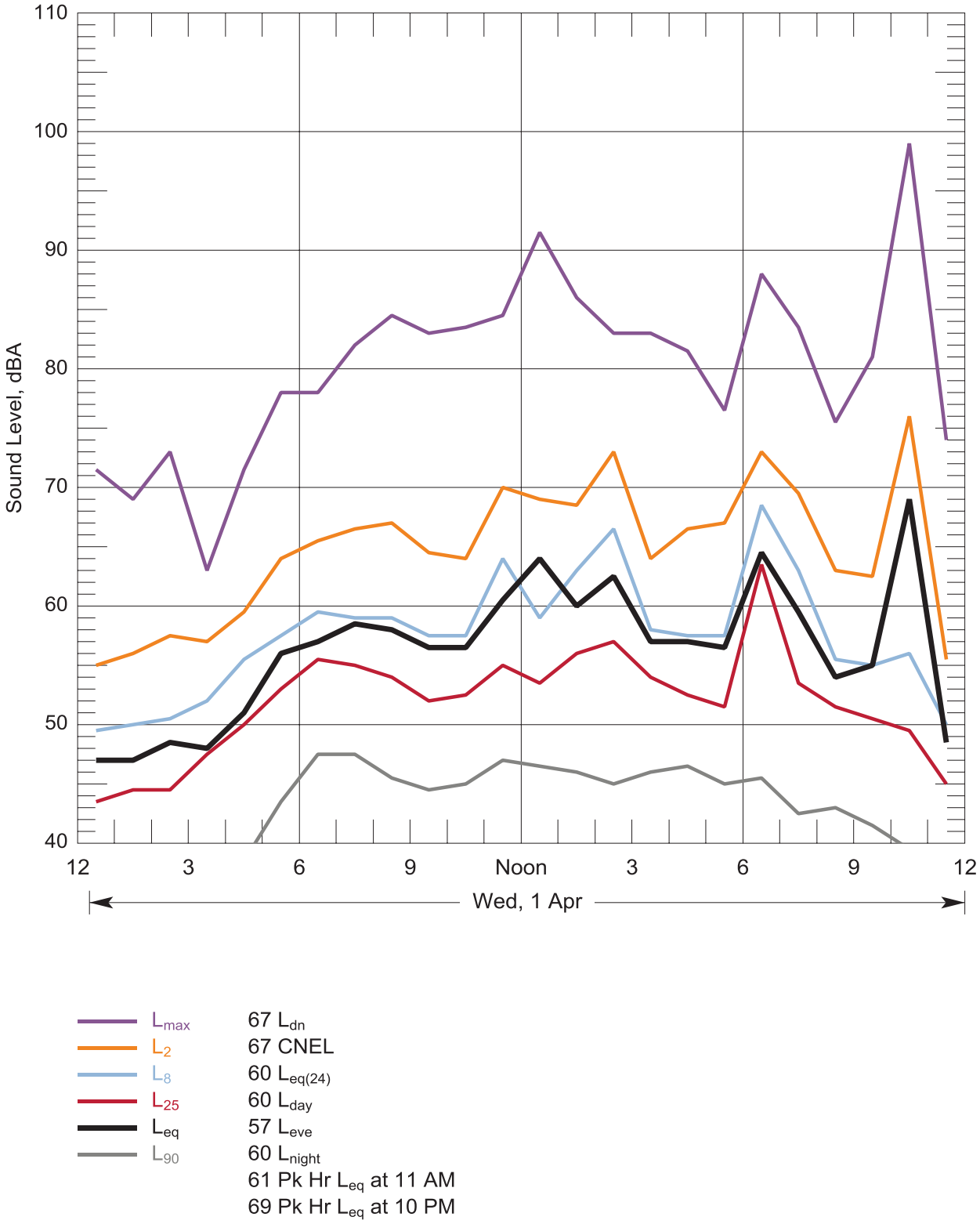

Figure 62: Hourly statistical summary of noise levels measured at Location 9 - 205 Murrey, Oakville on 01 Apr, 2015 and daily-average descriptors

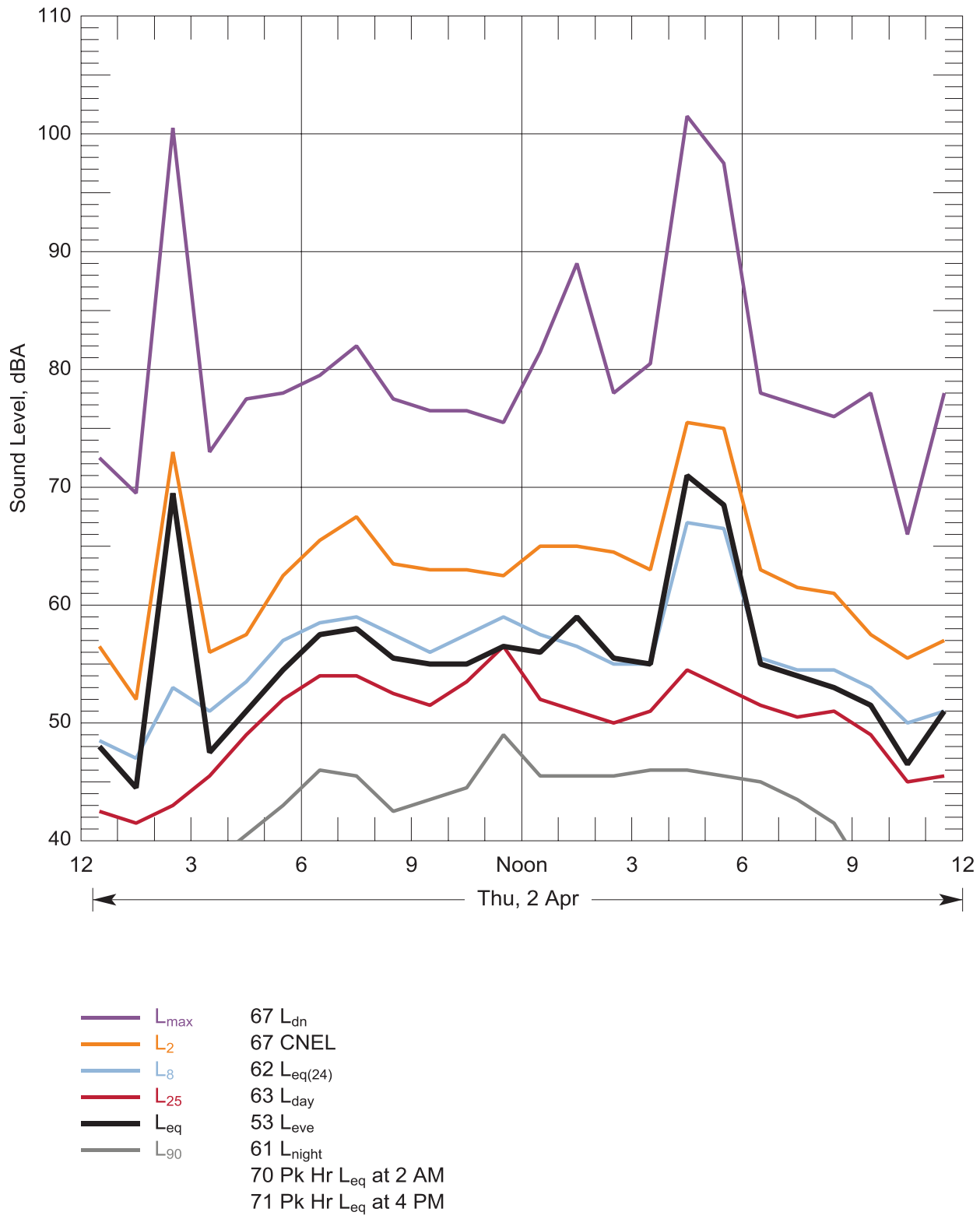

Figure 63: Hourly statistical summary of noise levels measured at Location 9 - 205 Murrey, Oakville on 02 Apr, 2015 and daily-average descriptors

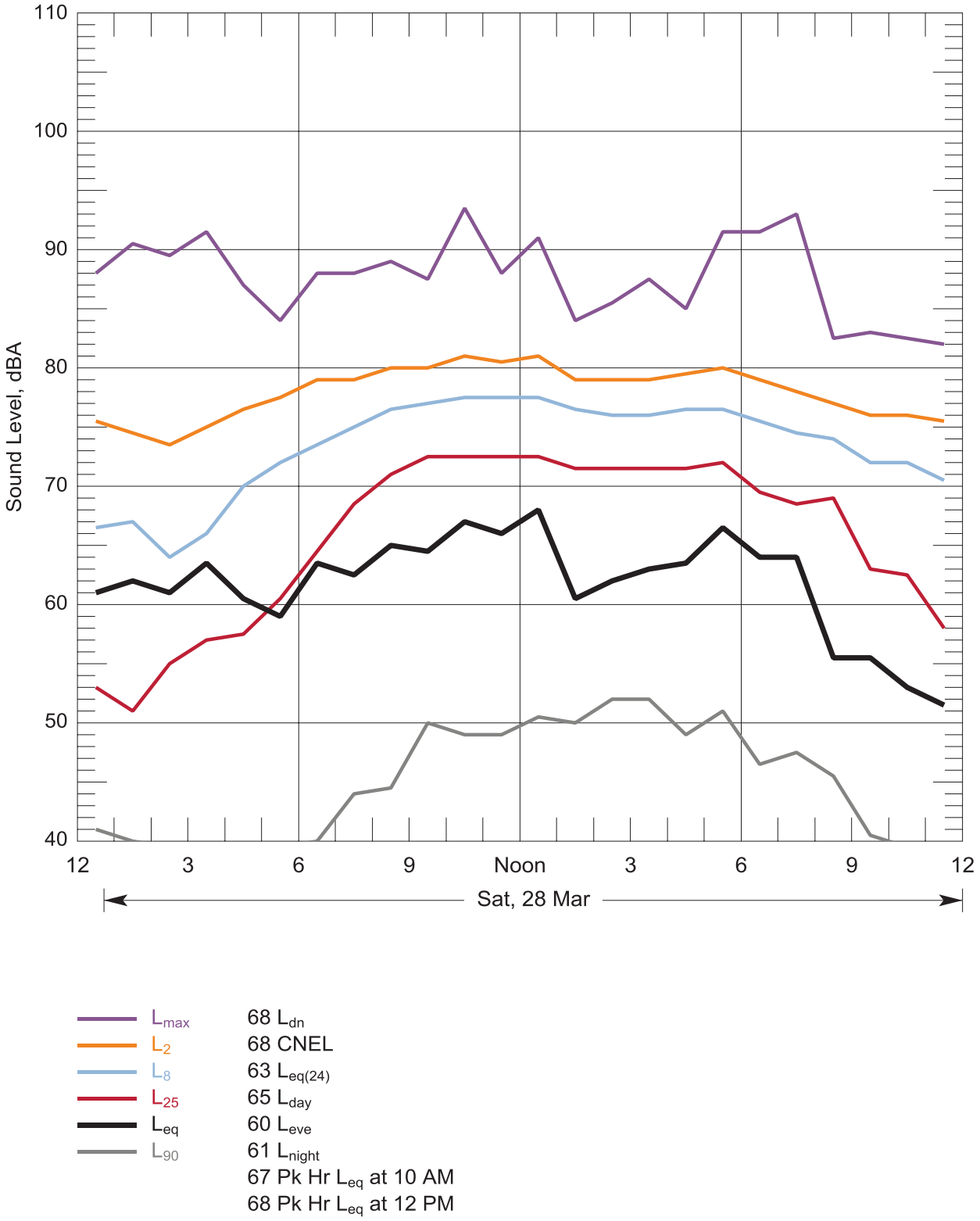

Figure 64: Hourly statistical summary of noise levels measured at Location 10 – 22 Evergreen Village Lane, Elma on 28 Mar, 2015 and daily-average descriptors

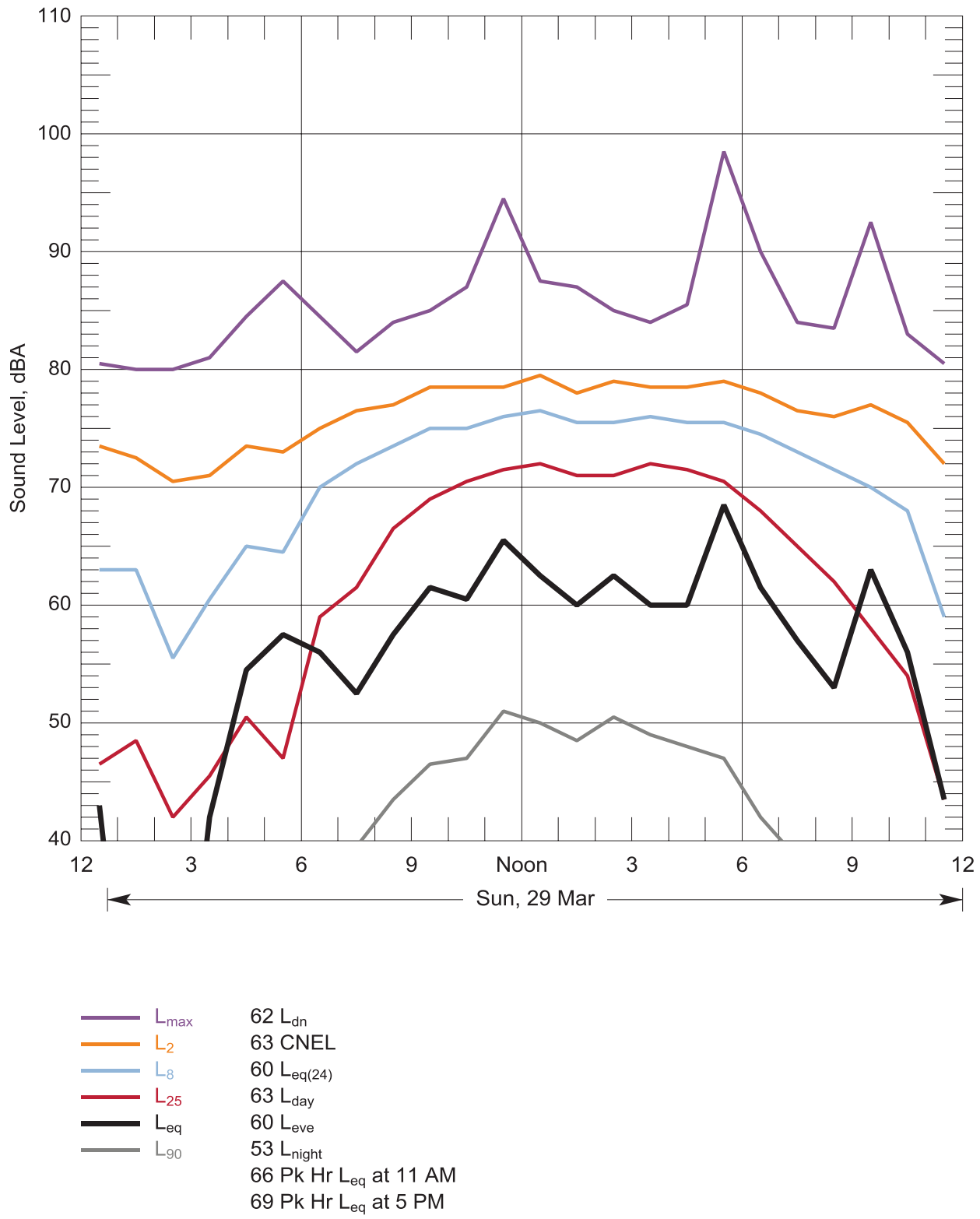

Figure 65: Hourly statistical summary of noise levels measured at Location 10 – 22 Evergreen Village Lane, Elma on 29 Mar, 2015 and daily-average descriptors

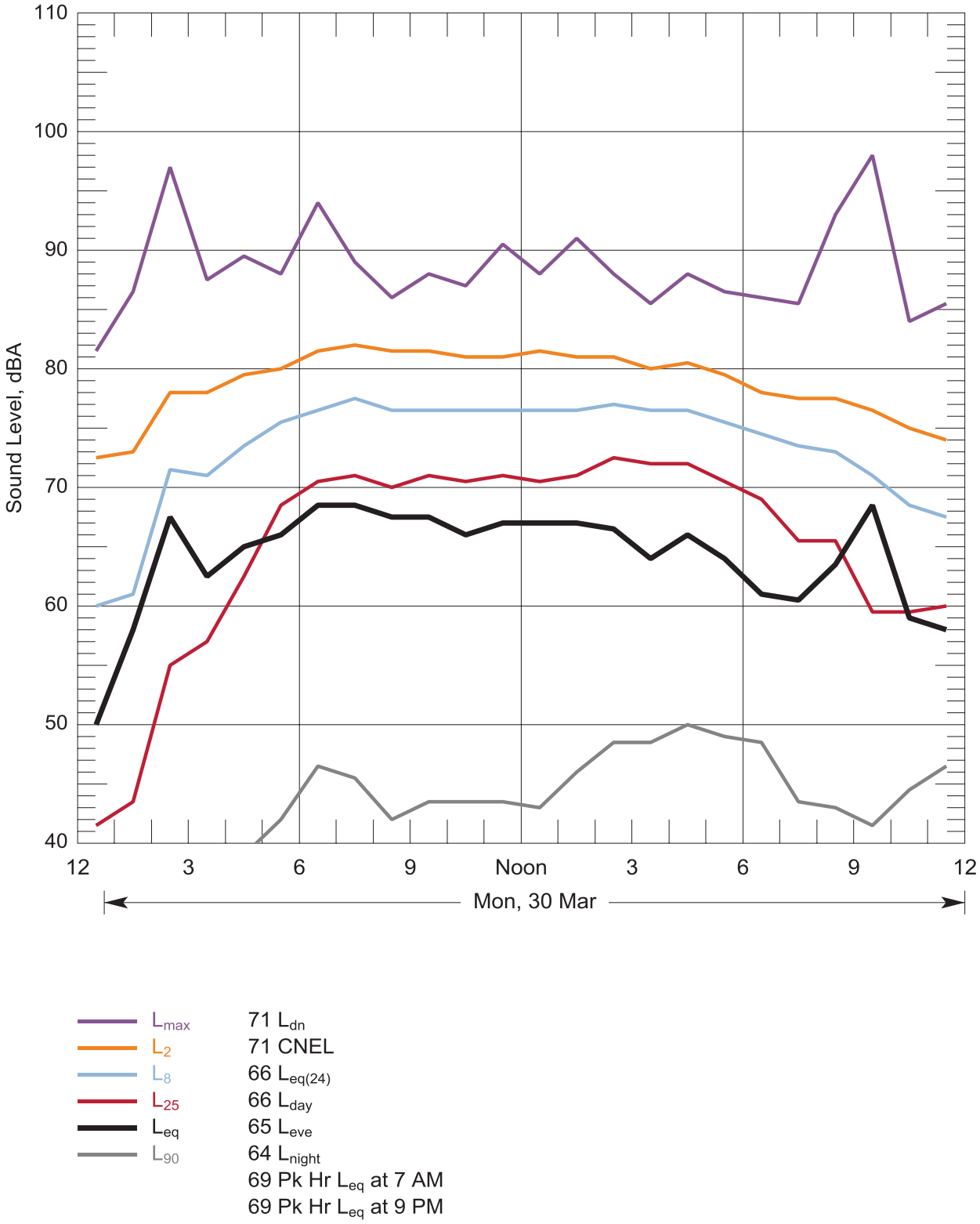

Figure 66: Hourly statistical summary of noise levels measured at Location 10 – 22 Evergreen Village Lane, Elma on 30 Mar, 2015 and daily-average descriptors

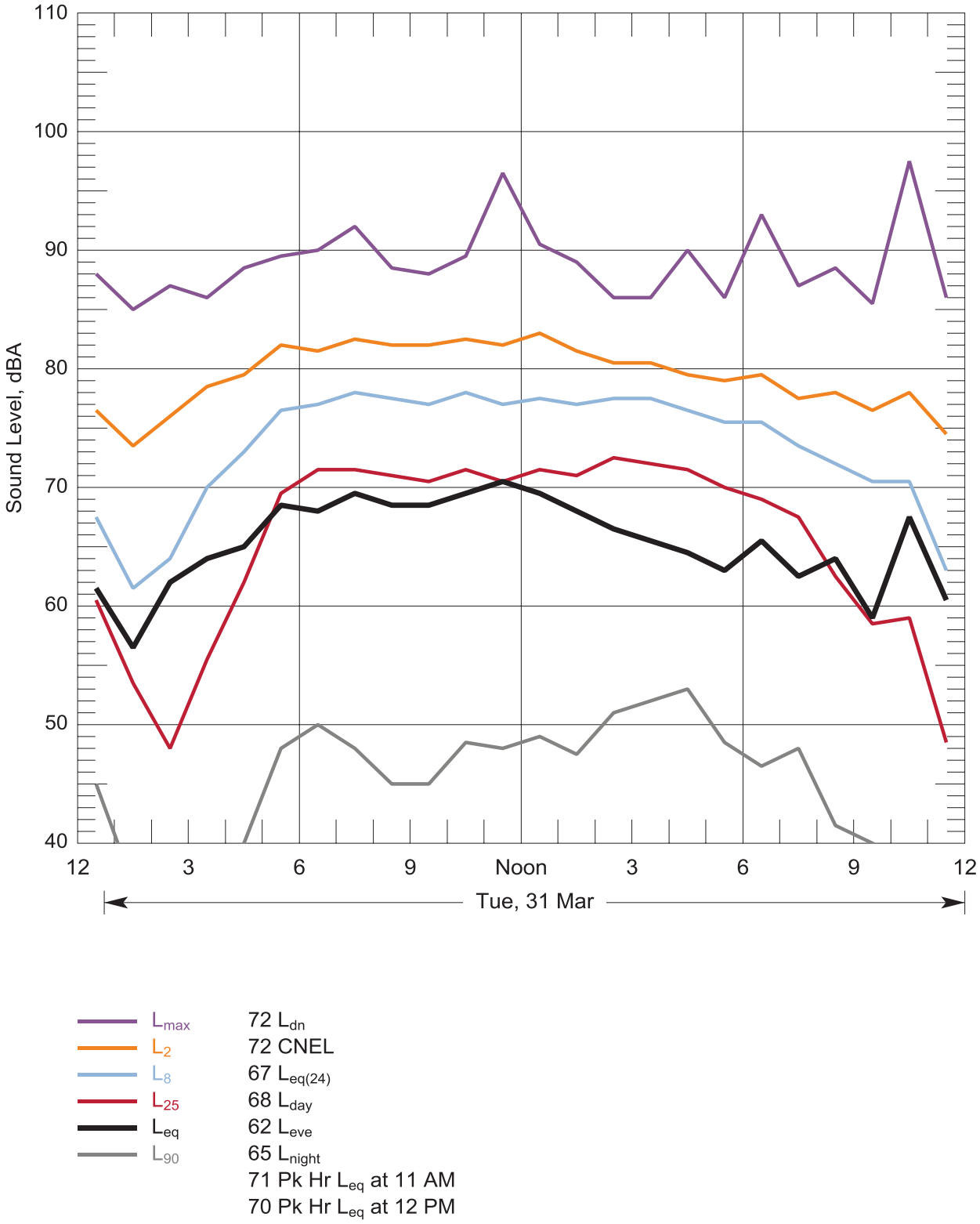

Figure 67: Hourly statistical summary of noise levels measured at Location 10 – 22 Evergreen Village Lane, Elma on 31 Mar, 2015 and daily-average descriptors

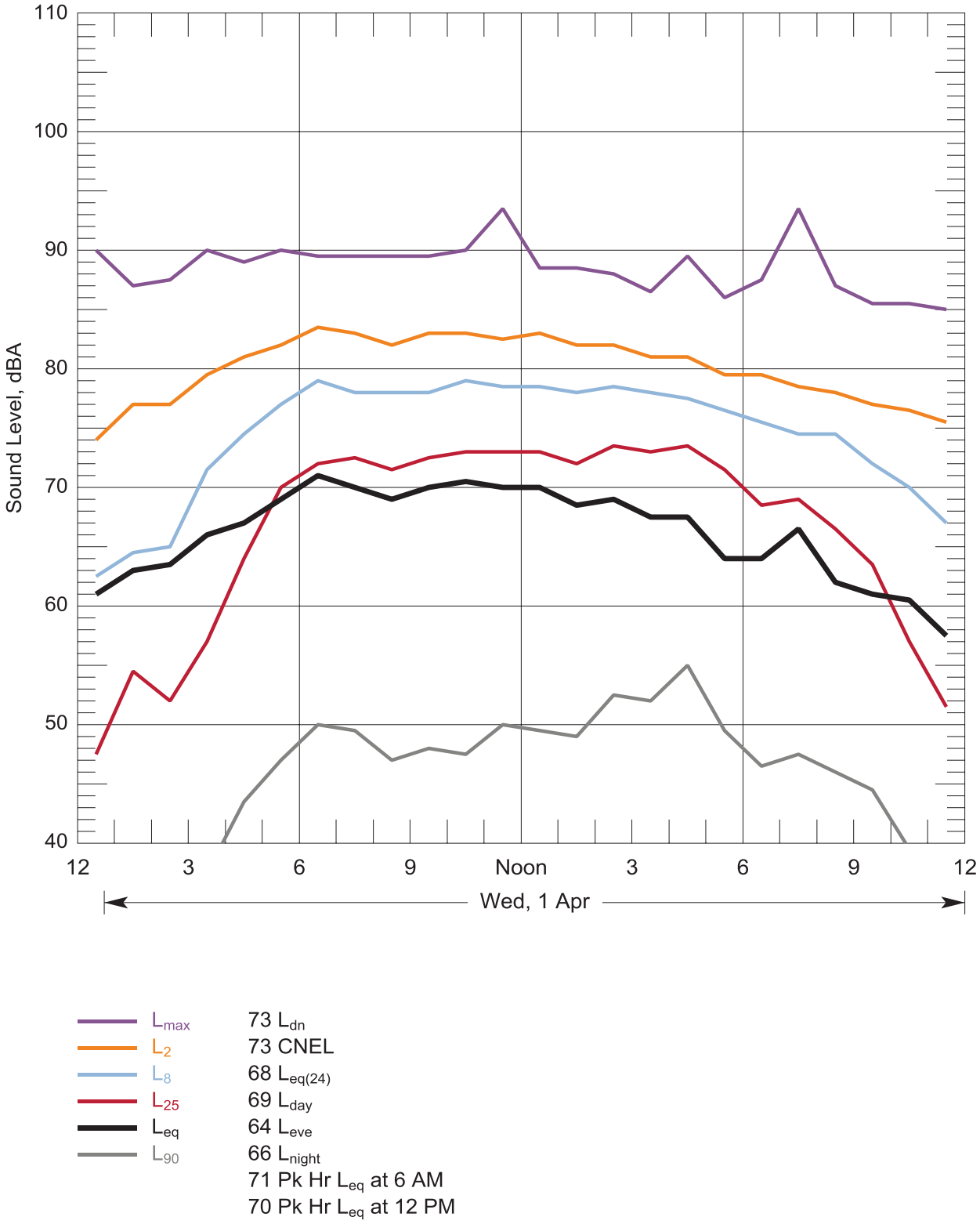

Figure 68: Hourly statistical summary of noise levels measured at Location 10 – 22 Evergreen Village Lane, Elma on 01 Apr, 2015 and daily-average descriptors

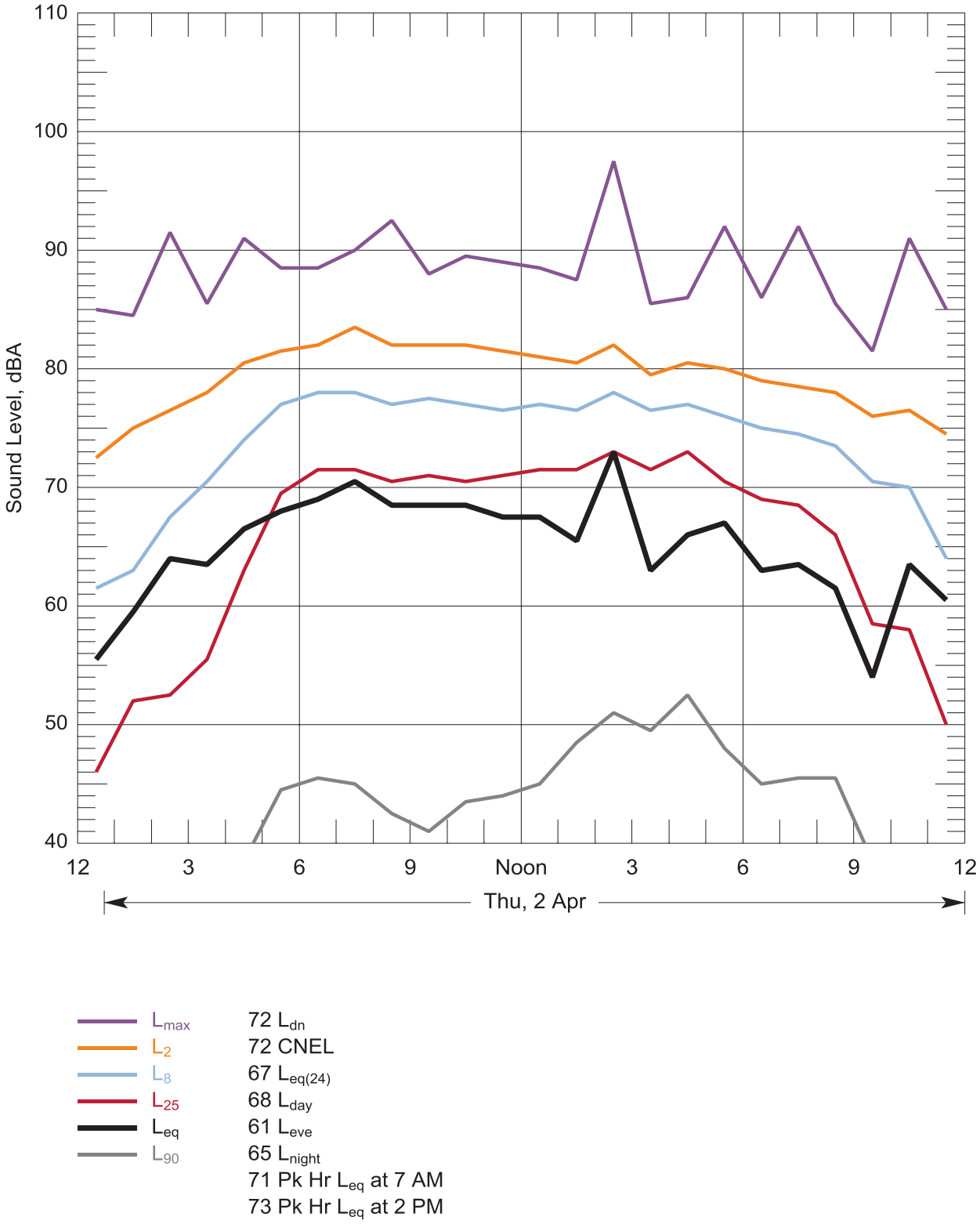

Figure 69: Hourly statistical summary of noise levels measured at Location 10 – 22 Evergreen Village Lane, Elma on 02 Apr, 2015 and daily-average descriptors

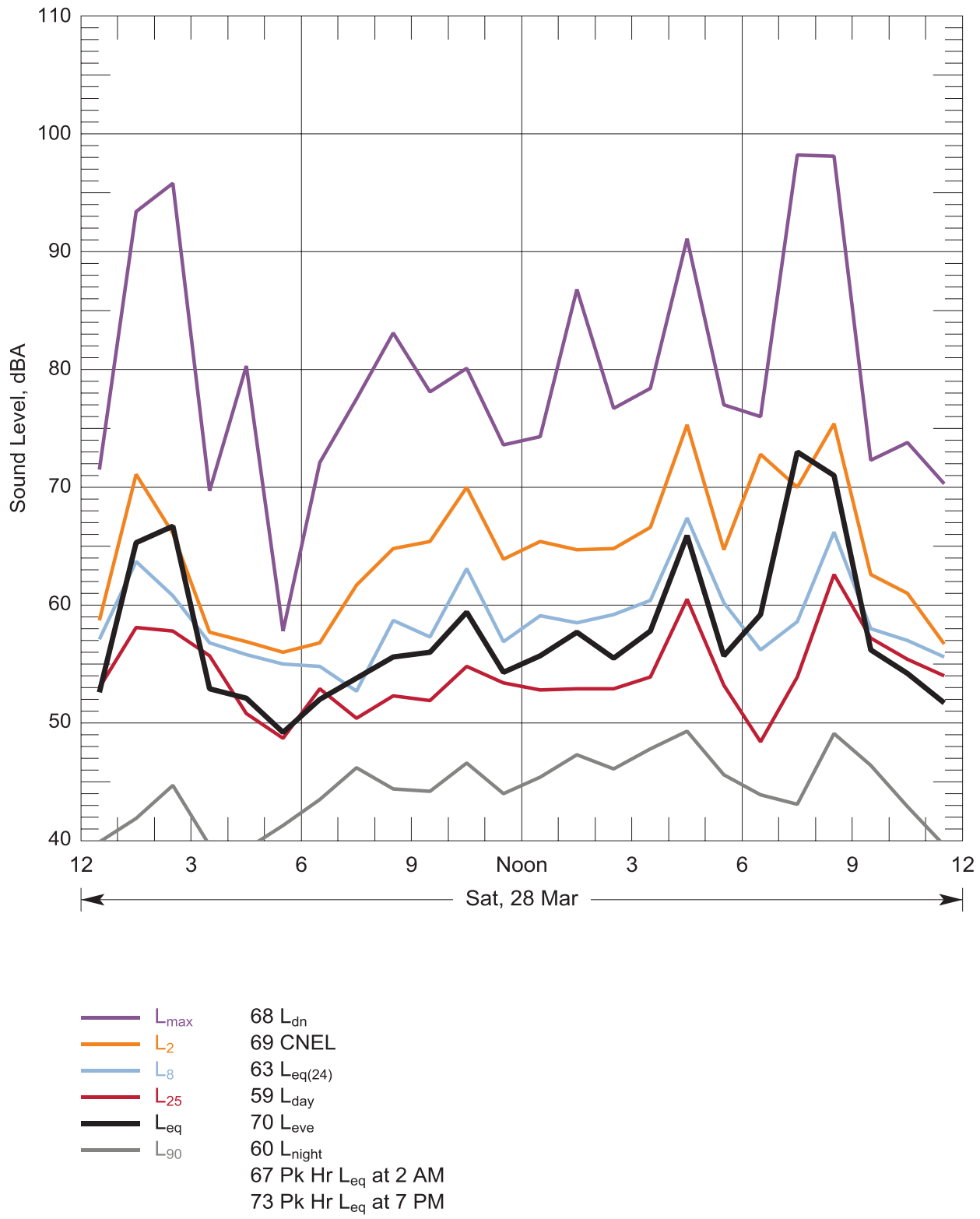

Figure 70: Hourly statistical summary of noise levels measured at Location 11 – 513 N 13th St, Elma on 28 Mar, 2015 and daily-average descriptors

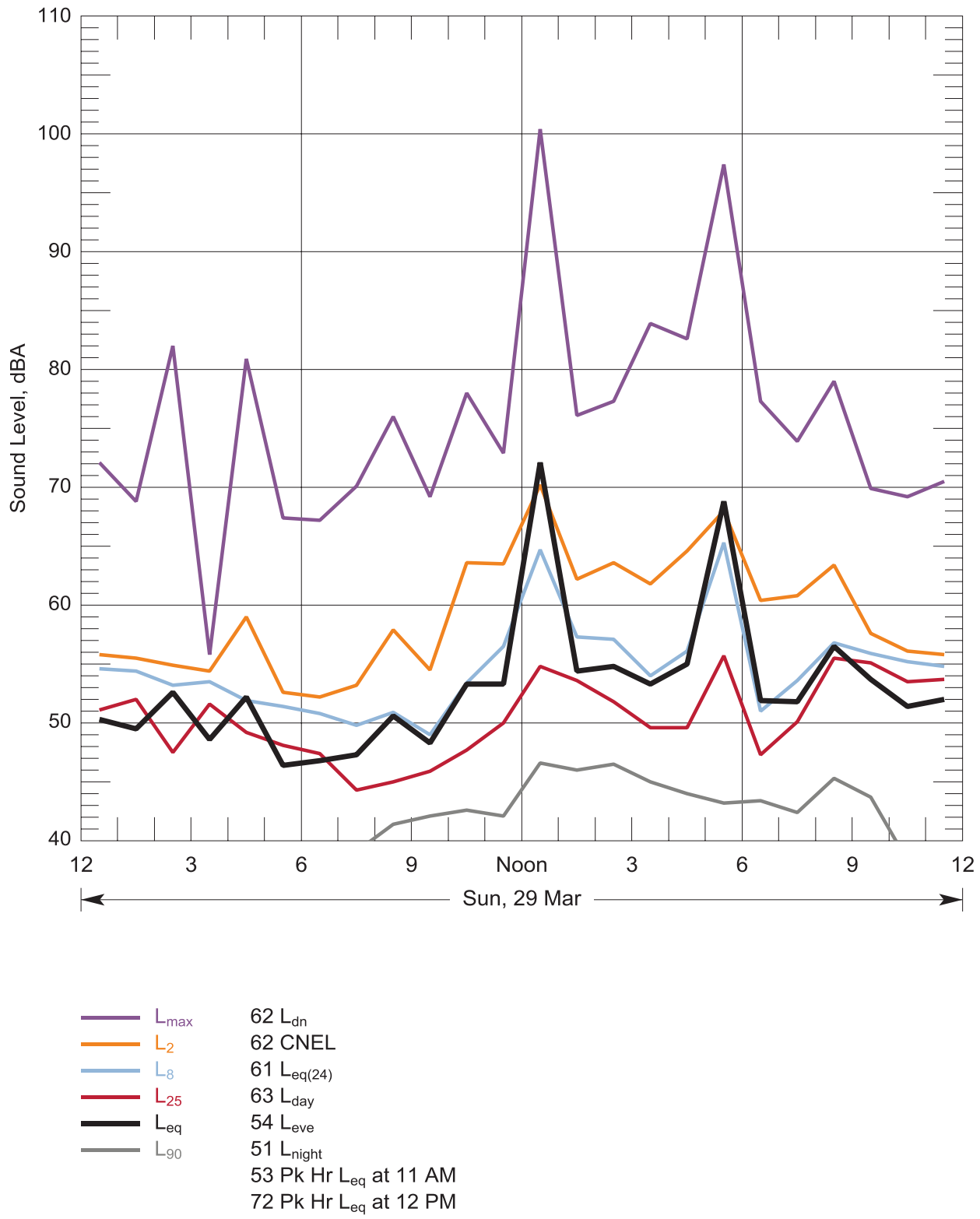

Figure 71: Hourly statistical summary of noise levels measured at Location 11 – 513 N 13th St, Elma on 29 Mar, 2015 and daily-average descriptors

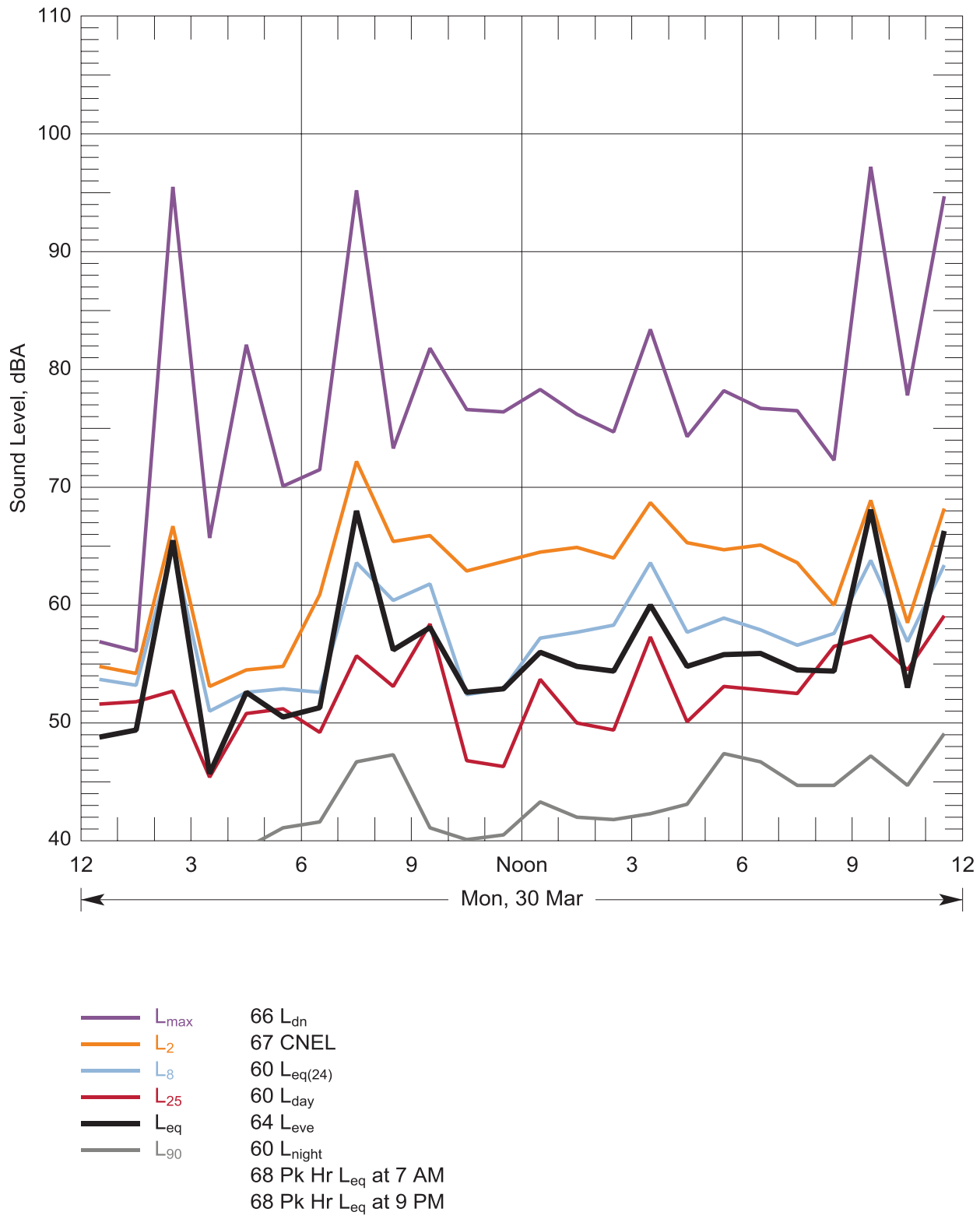

Figure 72: Hourly statistical summary of noise levels measured at Location 11 – 513 N 13th St, Elma on 30 Mar, 2015 and daily-average descriptors

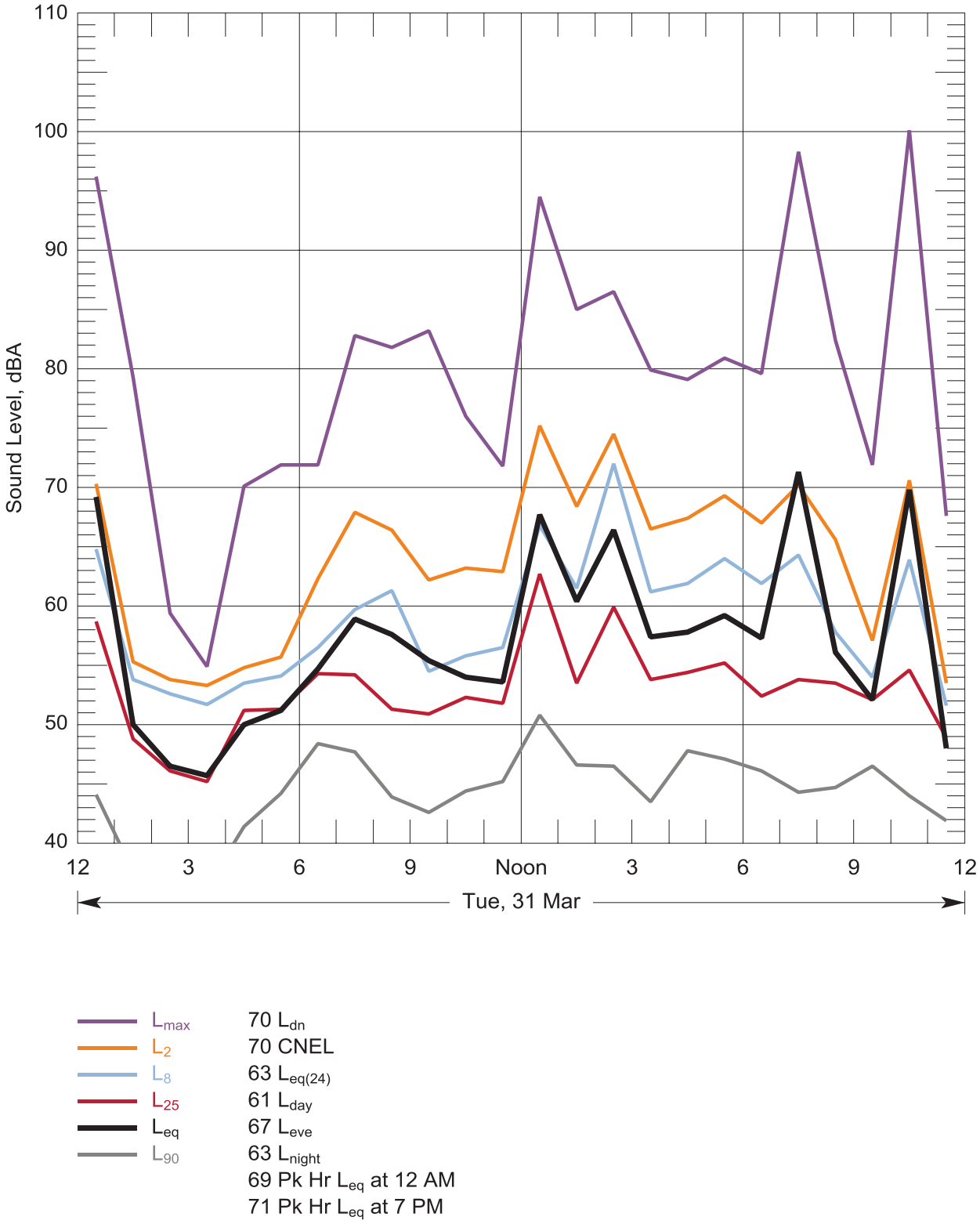

Figure 73: Hourly statistical summary of noise levels measured at Location 11 – 513 N 13th St, Elma and daily-average descriptors

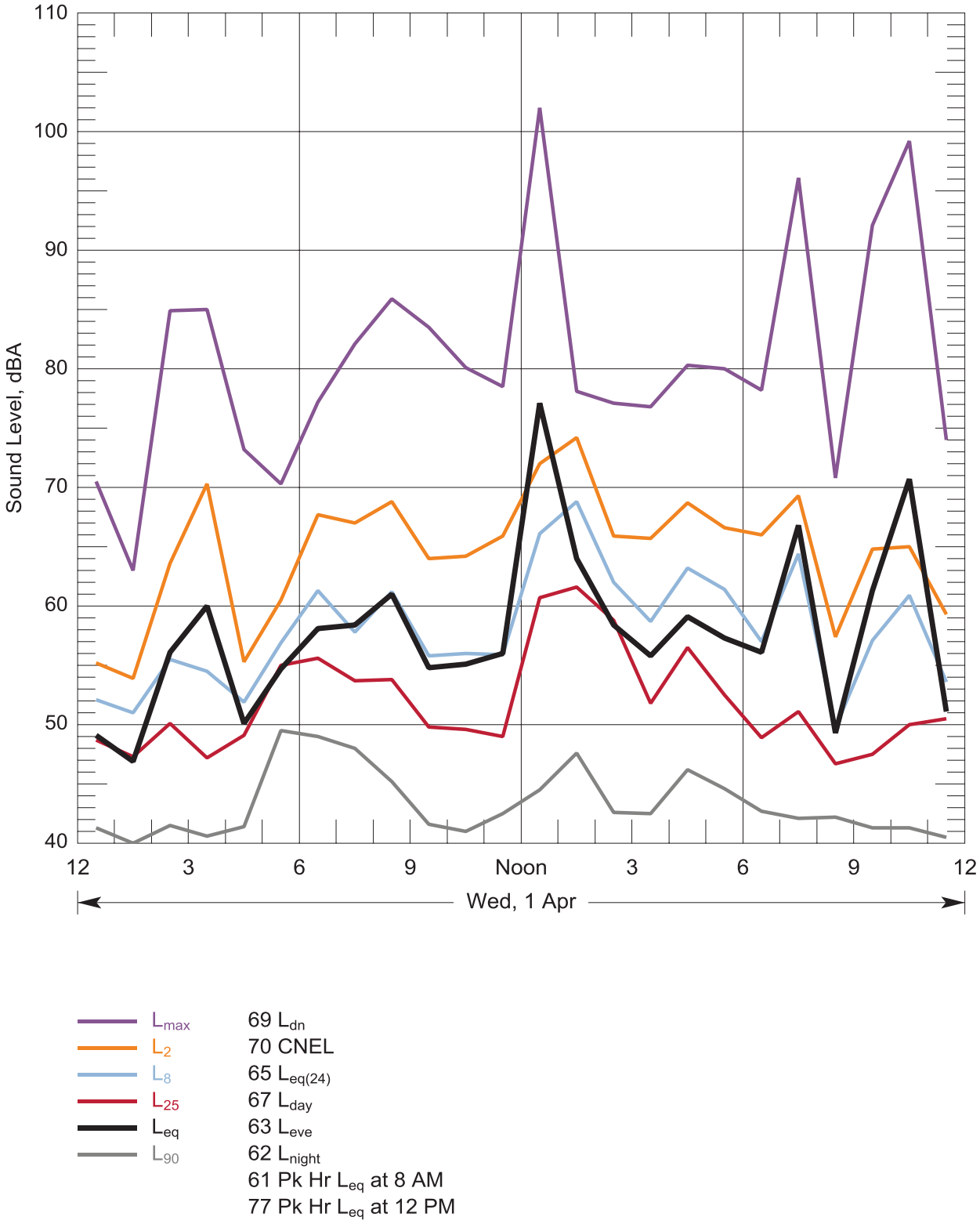

Figure 74: Hourly statistical summary of noise levels measured at Location 11 – 513 N 13th St, Elma on 01 Apr, 2015 and daily-average descriptors

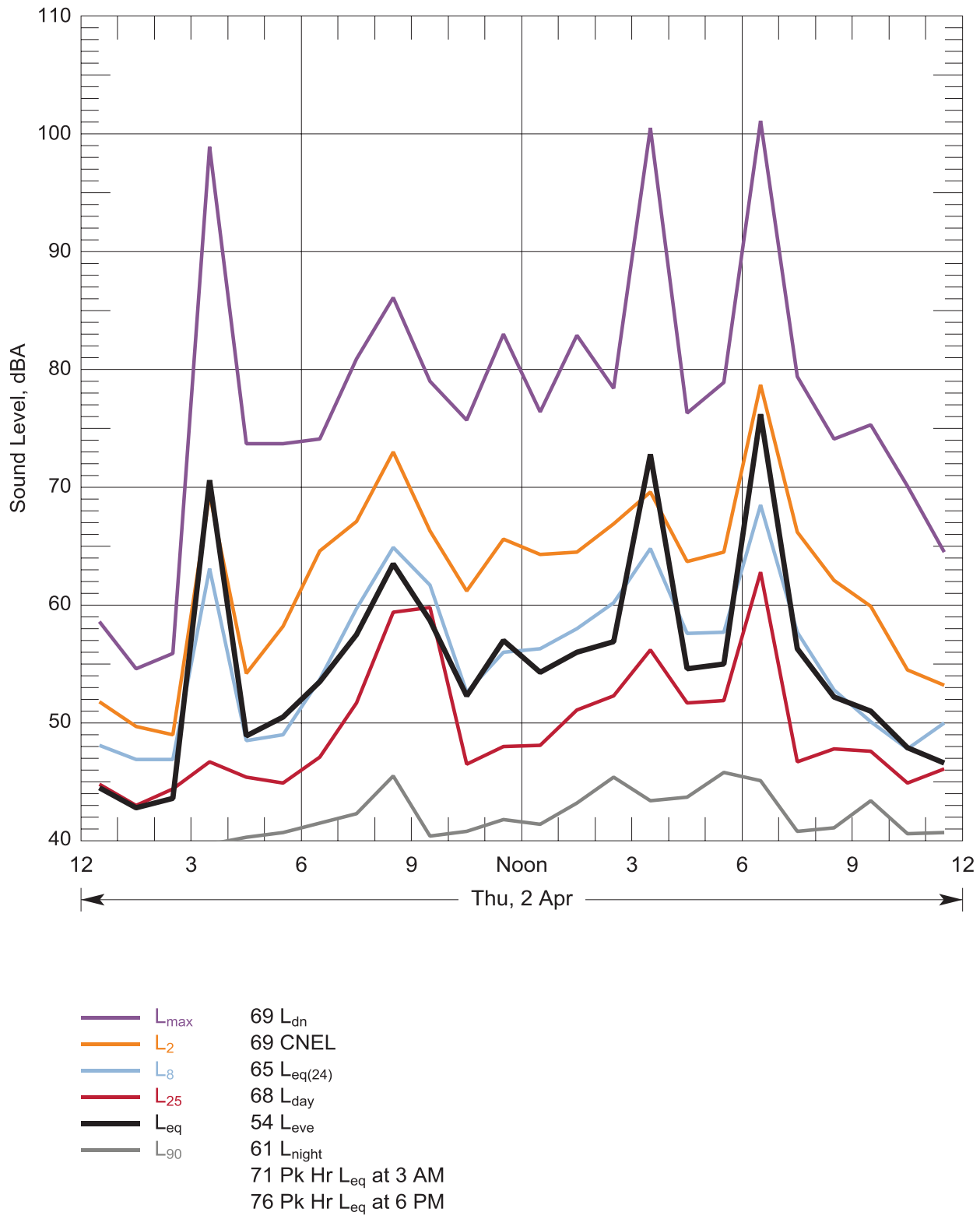

Figure 75: Hourly statistical summary of noise levels measured at Location 11 – 513 N 13th St, Elma on 02 Apr, 2015 and daily-average descriptors

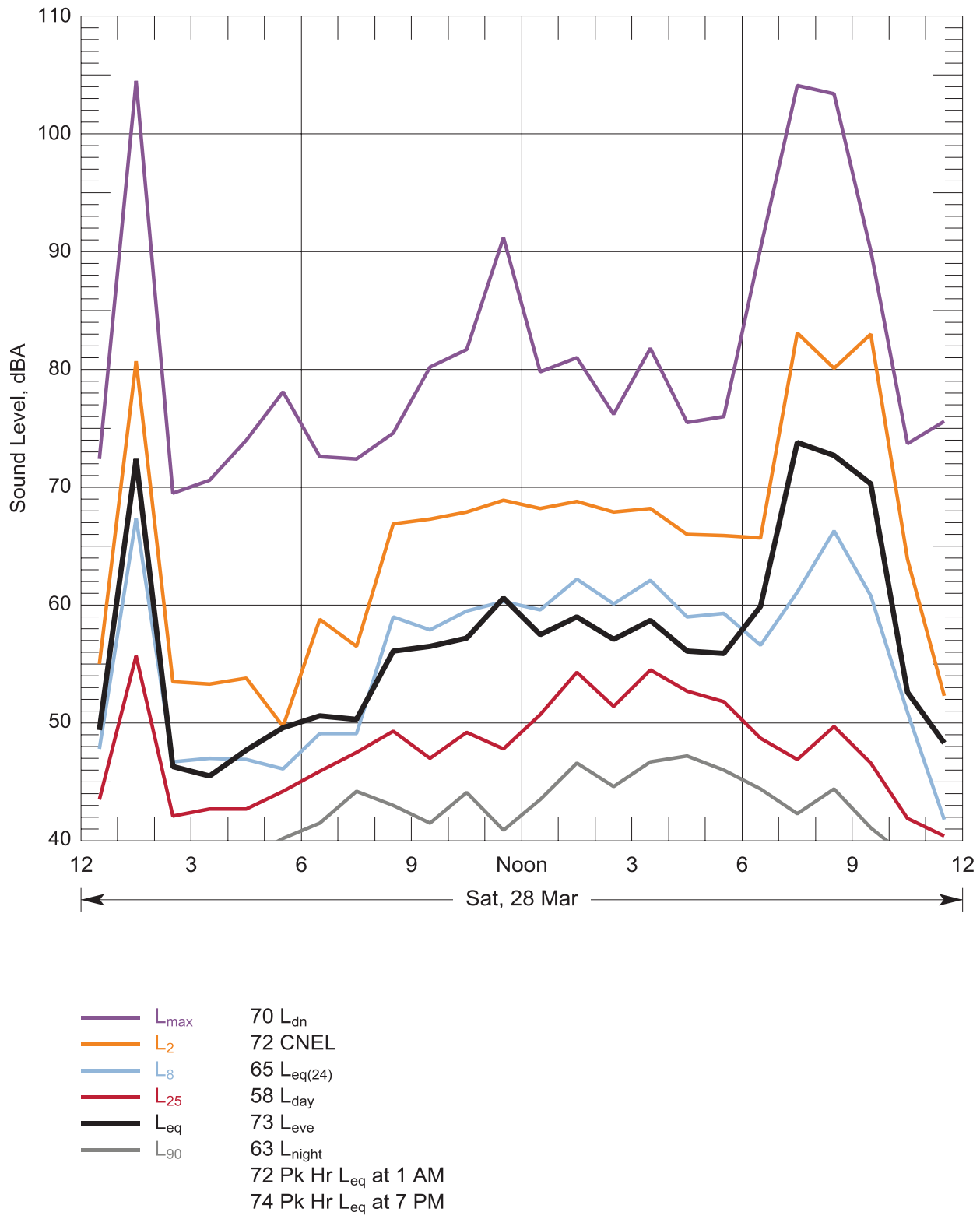

Figure 76: Hourly statistical summary of noise levels measured at Location 12 - 502 N 13th St, Elma on 28 Mar, 2015 and daily-average descriptors

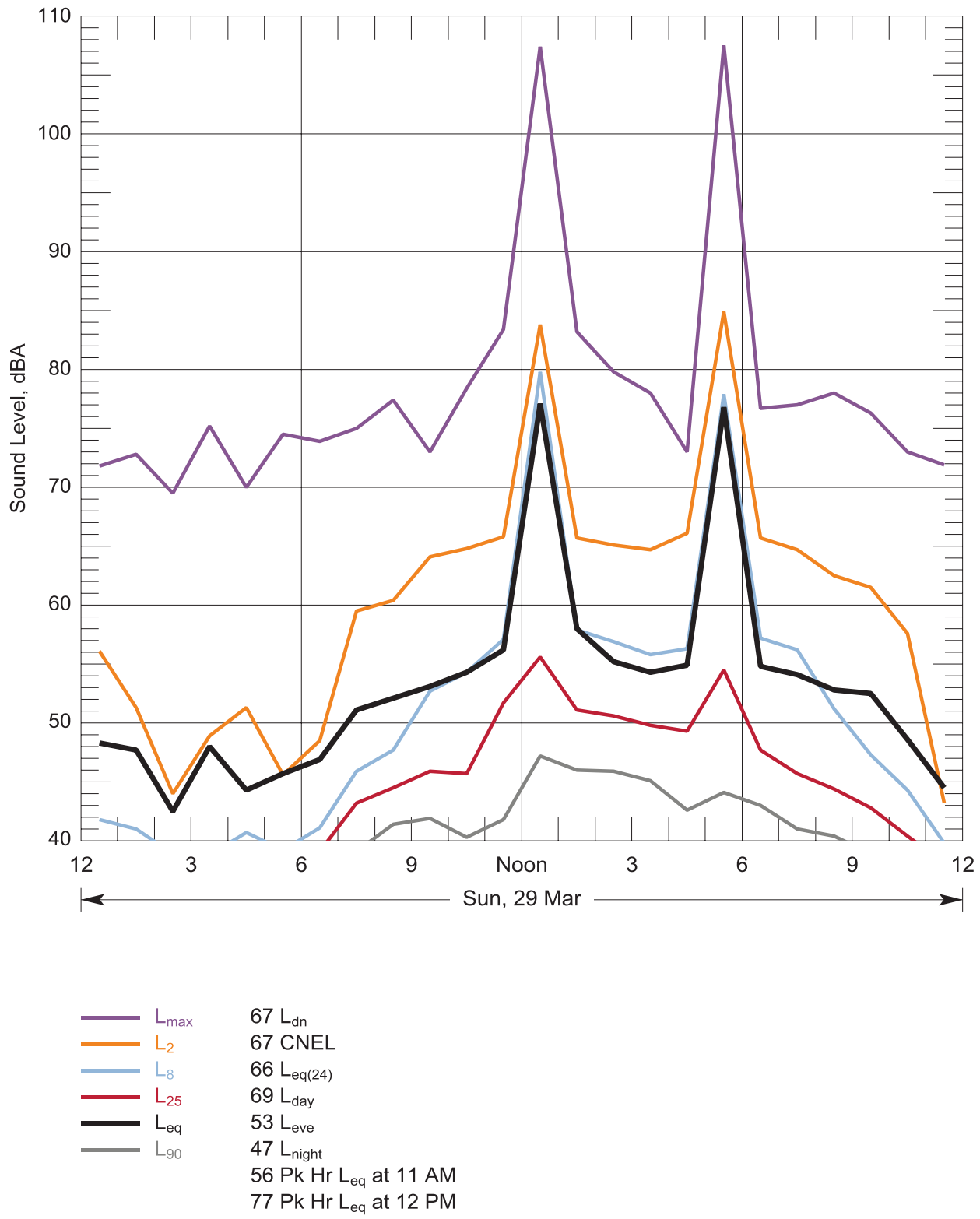

Figure 77: Hourly statistical summary of noise levels measured at Location 12 - 502 N 13th St, Elma on 29 Mar, 2015 and daily-average descriptors

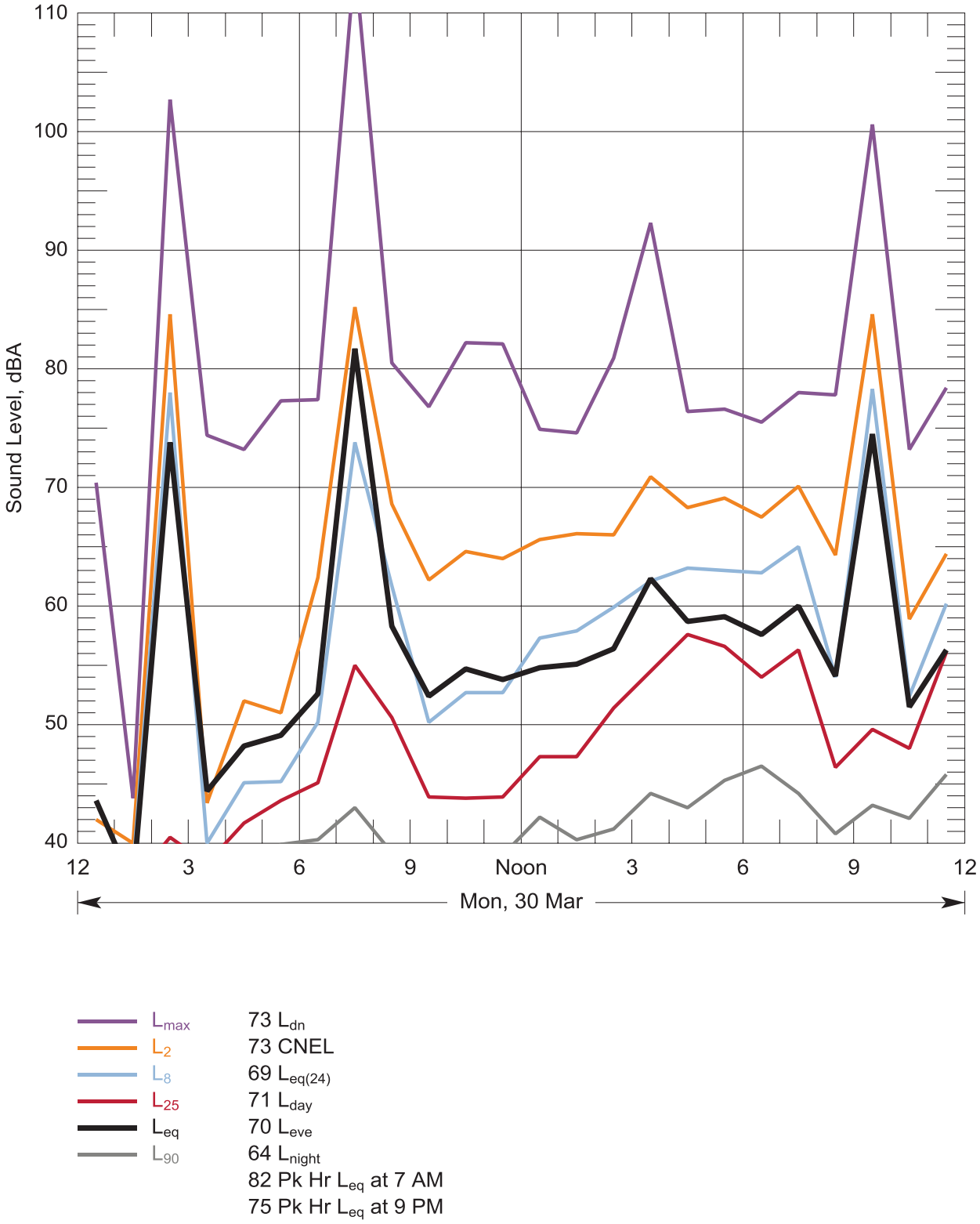

Figure 78: Hourly statistical summary of noise levels measured at Location 12 - 502 N 13th St, Elma on 30 Mar, 2015 and daily-average descriptors

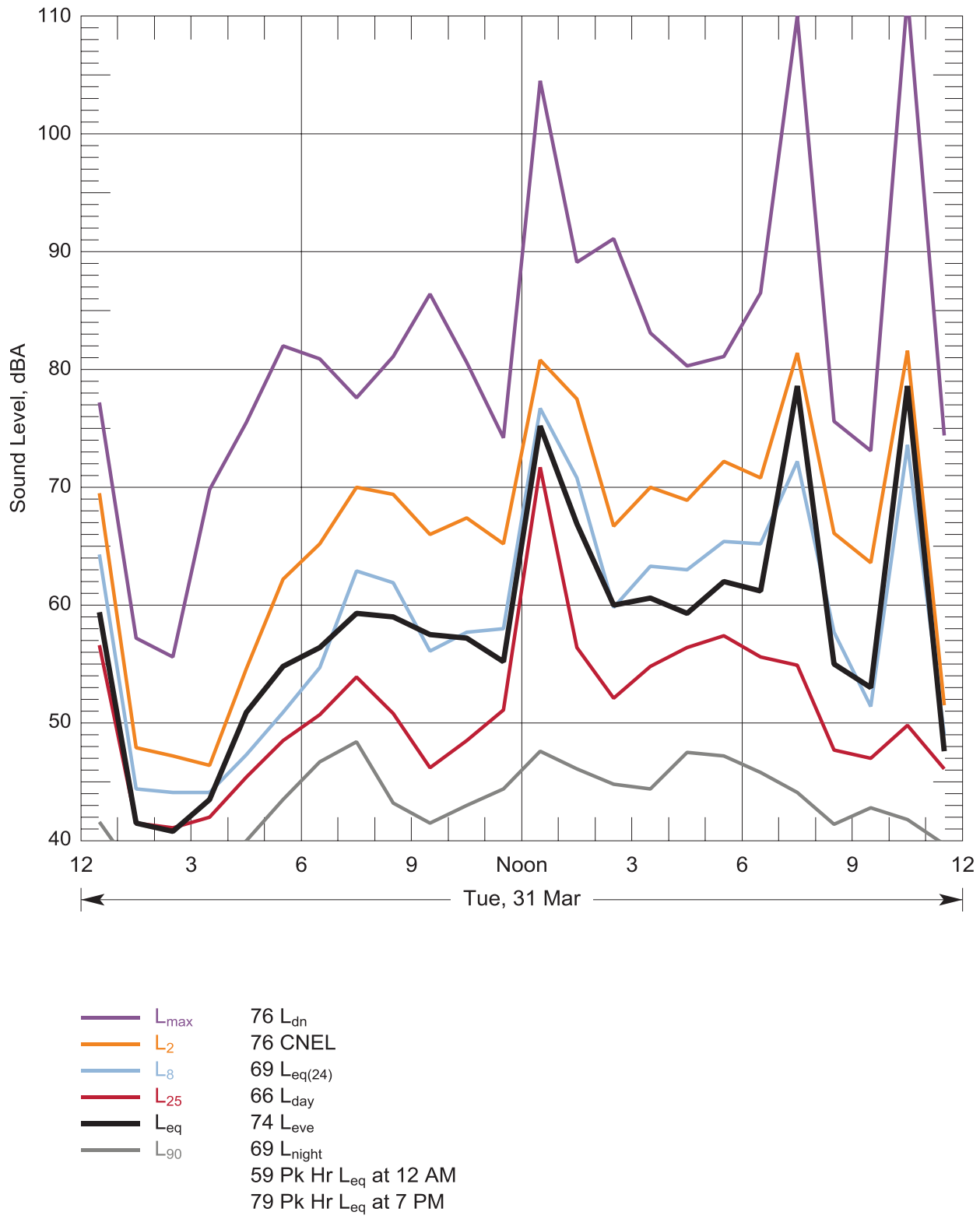

Figure 79: Hourly statistical summary of noise levels measured at Location 12 - 502 N 13th St, Elma on 31 Mar, 2015 and daily-average descriptors

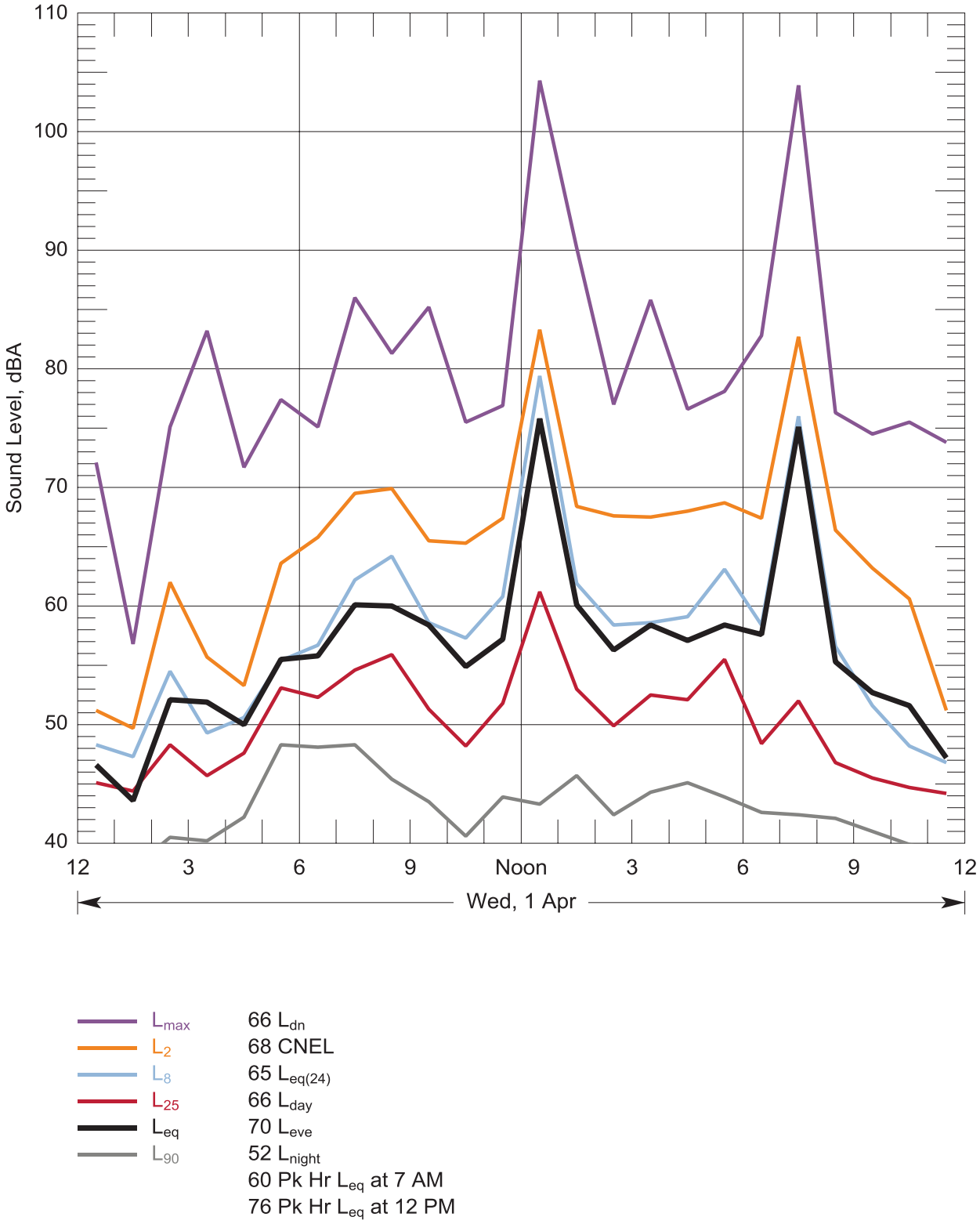

Figure 80: Hourly statistical summary of noise levels measured at Location 12 - 502 N 13th St, Elma on 01 Apr, 2015 and daily-average descriptors

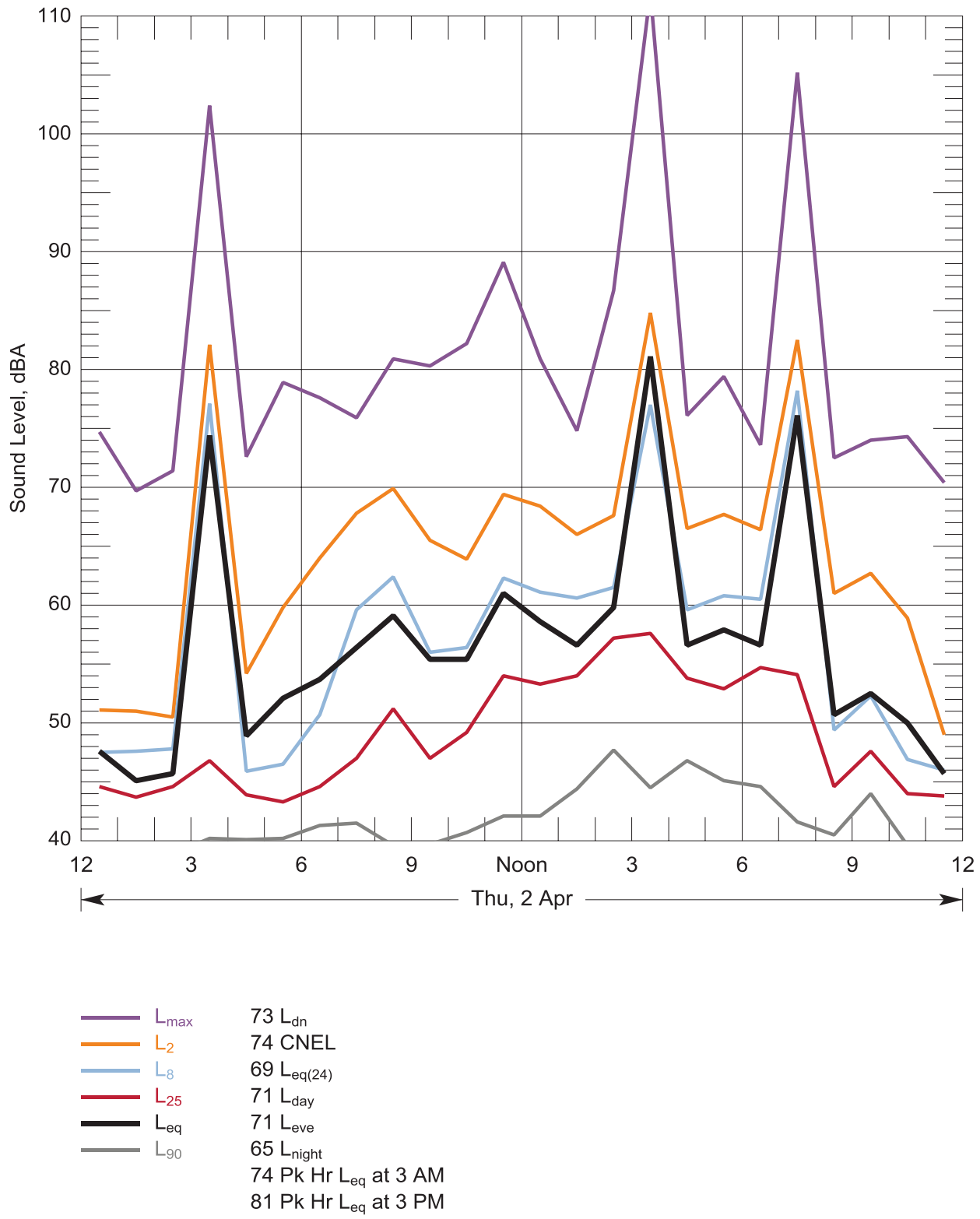

Figure 81: Hourly statistical summary of noise levels measured at Location 12 - 502 N 13th St, Elma on 02 Apr, 2015 and daily-average descriptors

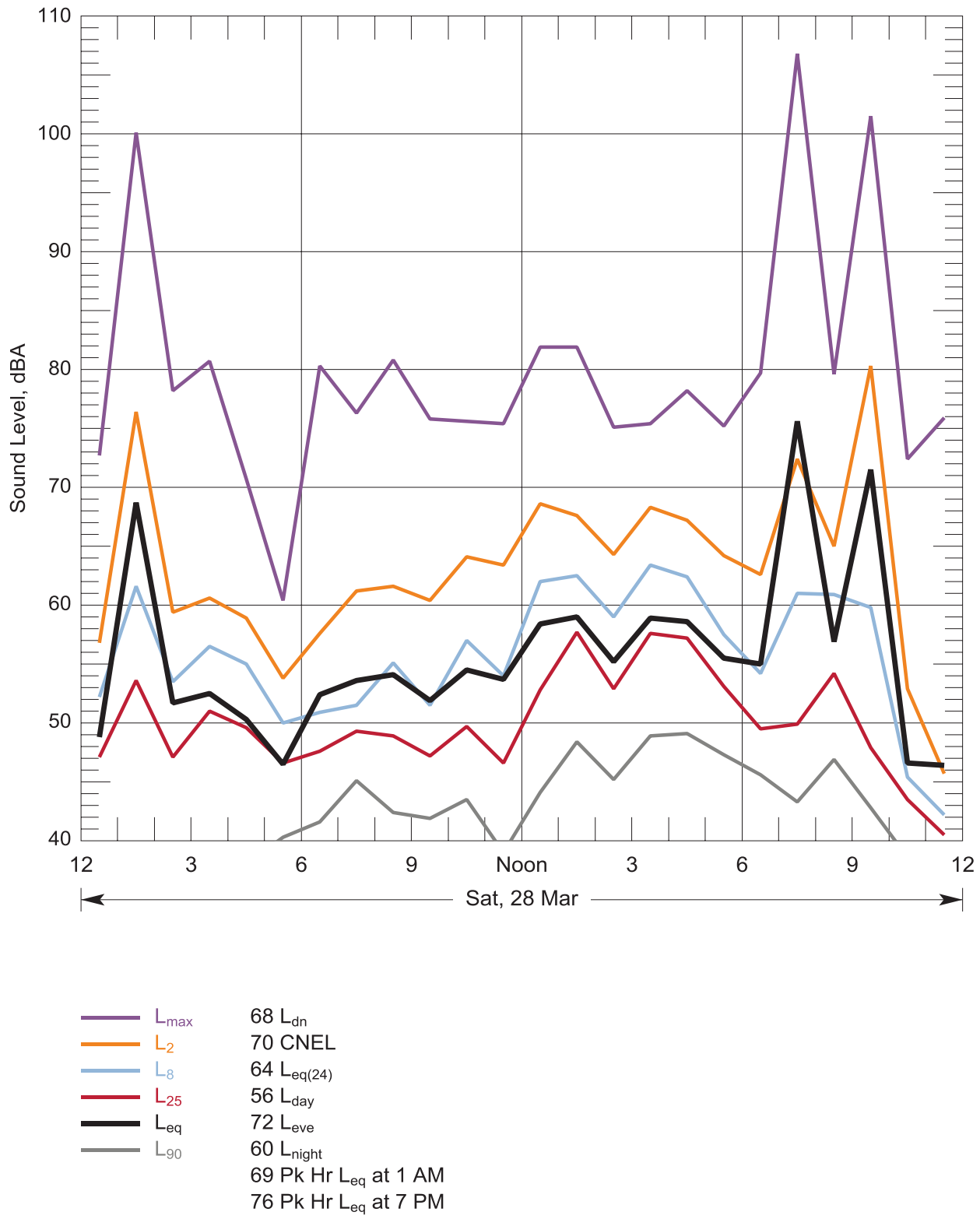

Figure 82: Hourly statistical summary of noise levels measured at Location 13 - 57 Hurd Rd, Elma on 28 Mar, 2015 and daily-average descriptors

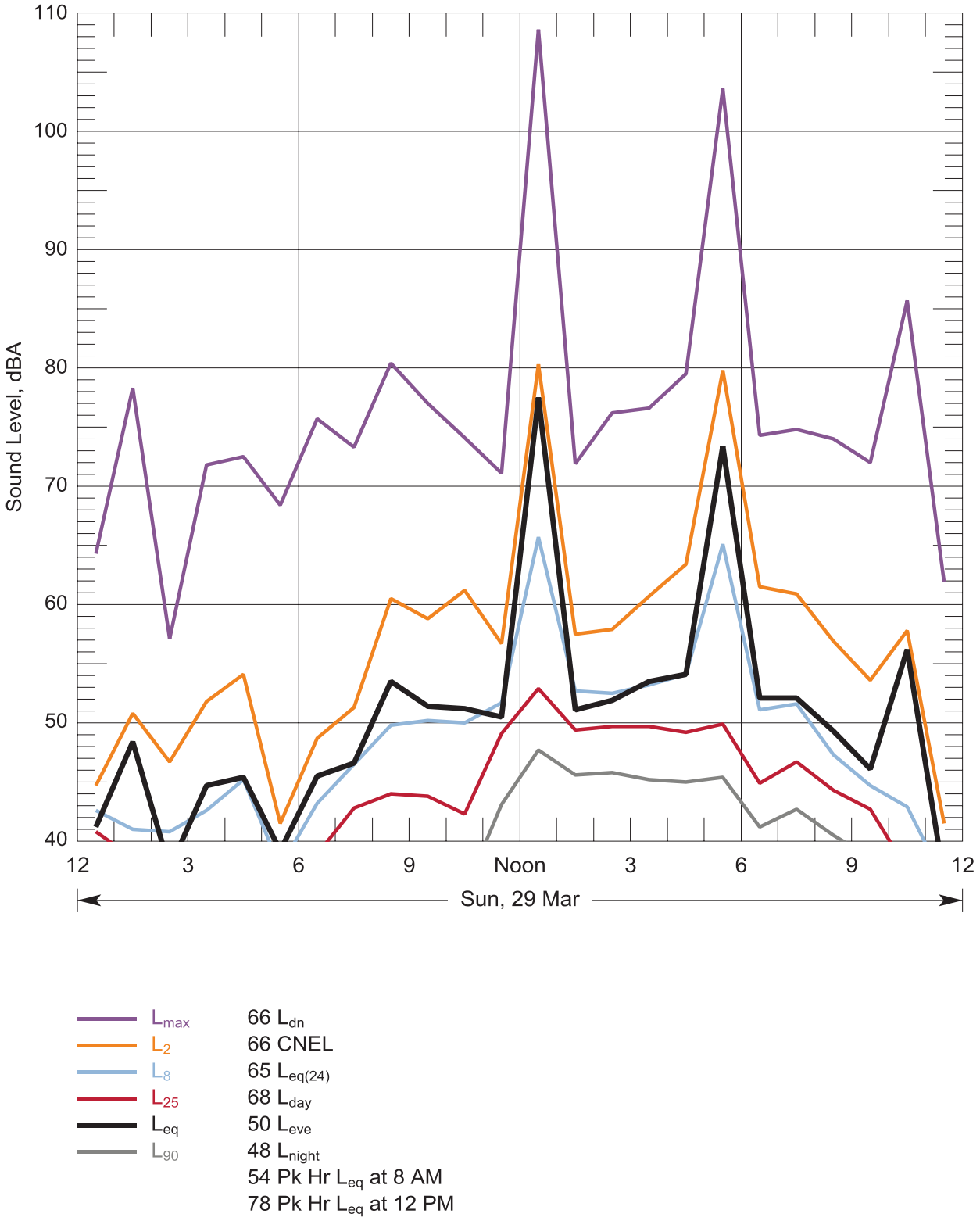

Figure 83: Hourly statistical summary of noise levels measured at Location 13 - 57 Hurd Rd, Elma on 29 Mar, 2015 and daily-average descriptors

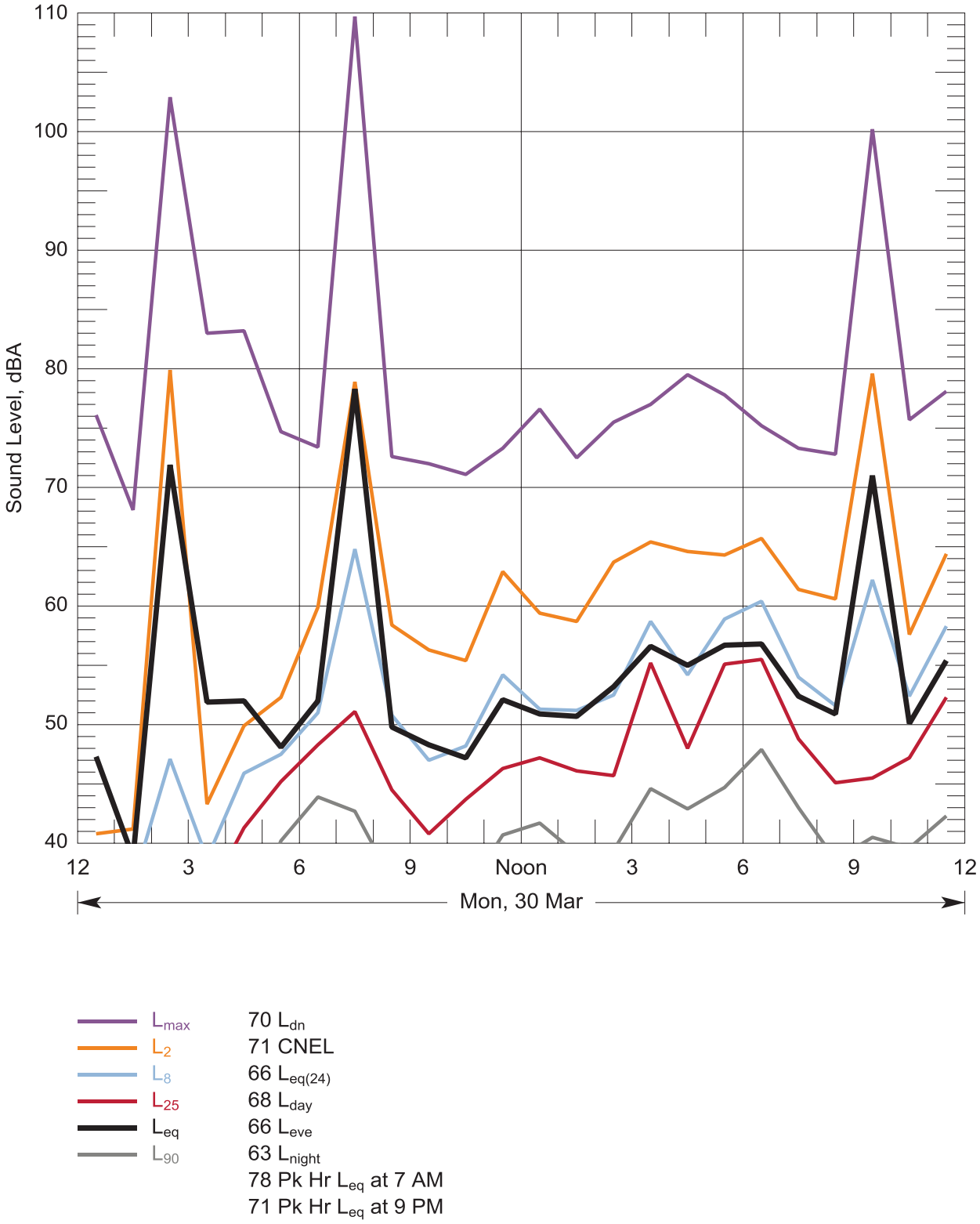

Figure 84: Hourly statistical summary of noise levels measured at Location 13 - 57 Hurd Rd, Elma on 30 Mar, 2015 and daily-average descriptors

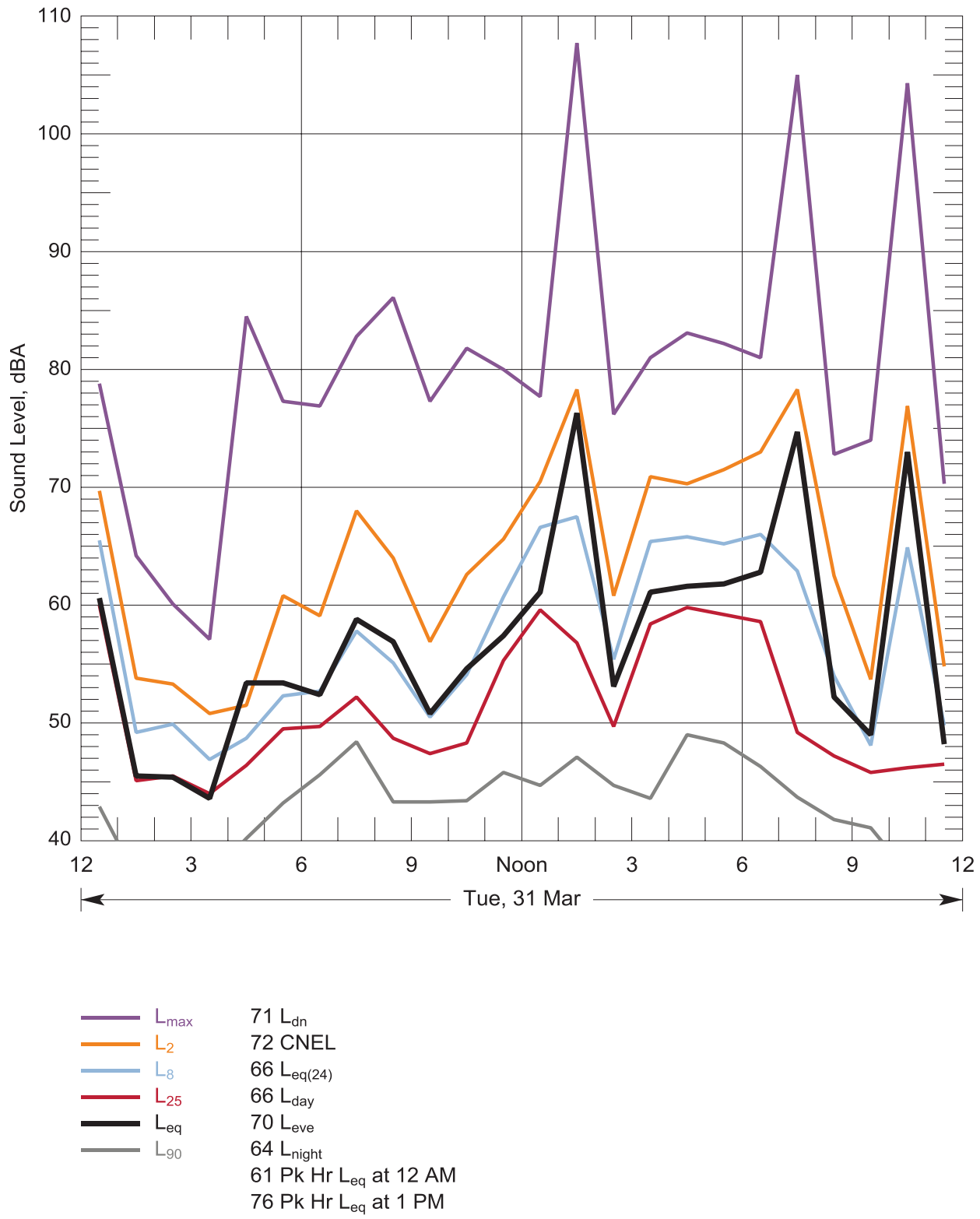

Figure 85: Hourly statistical summary of noise levels measured at Location 13 - 57 Hurd Rd, Elma on 31 Mar, 2015 and daily-average descriptors

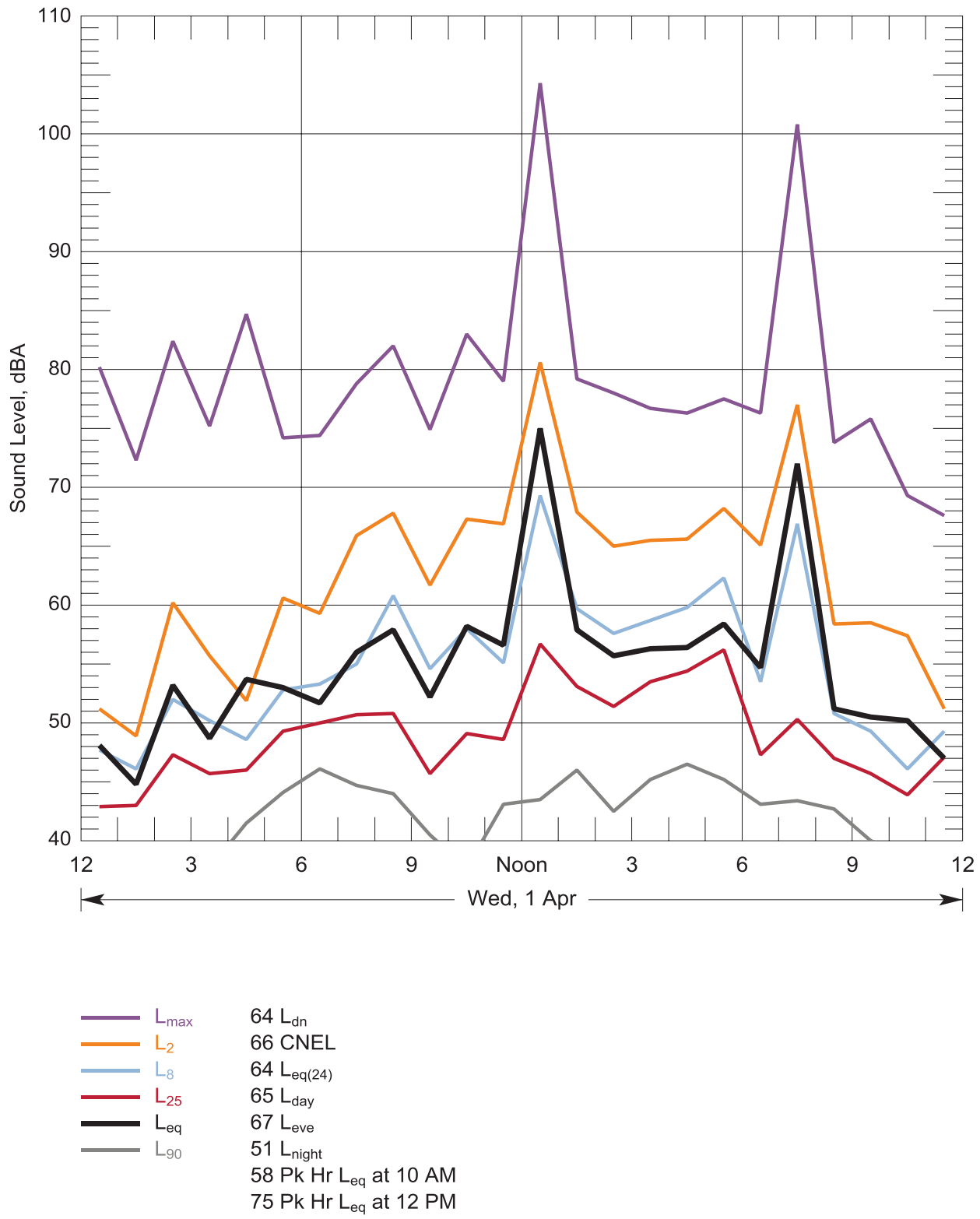

Figure 86: Hourly statistical summary of noise levels measured at Location 13 - 57 Hurd Rd, Elma on 01 Apr, 2015 and daily-average descriptors

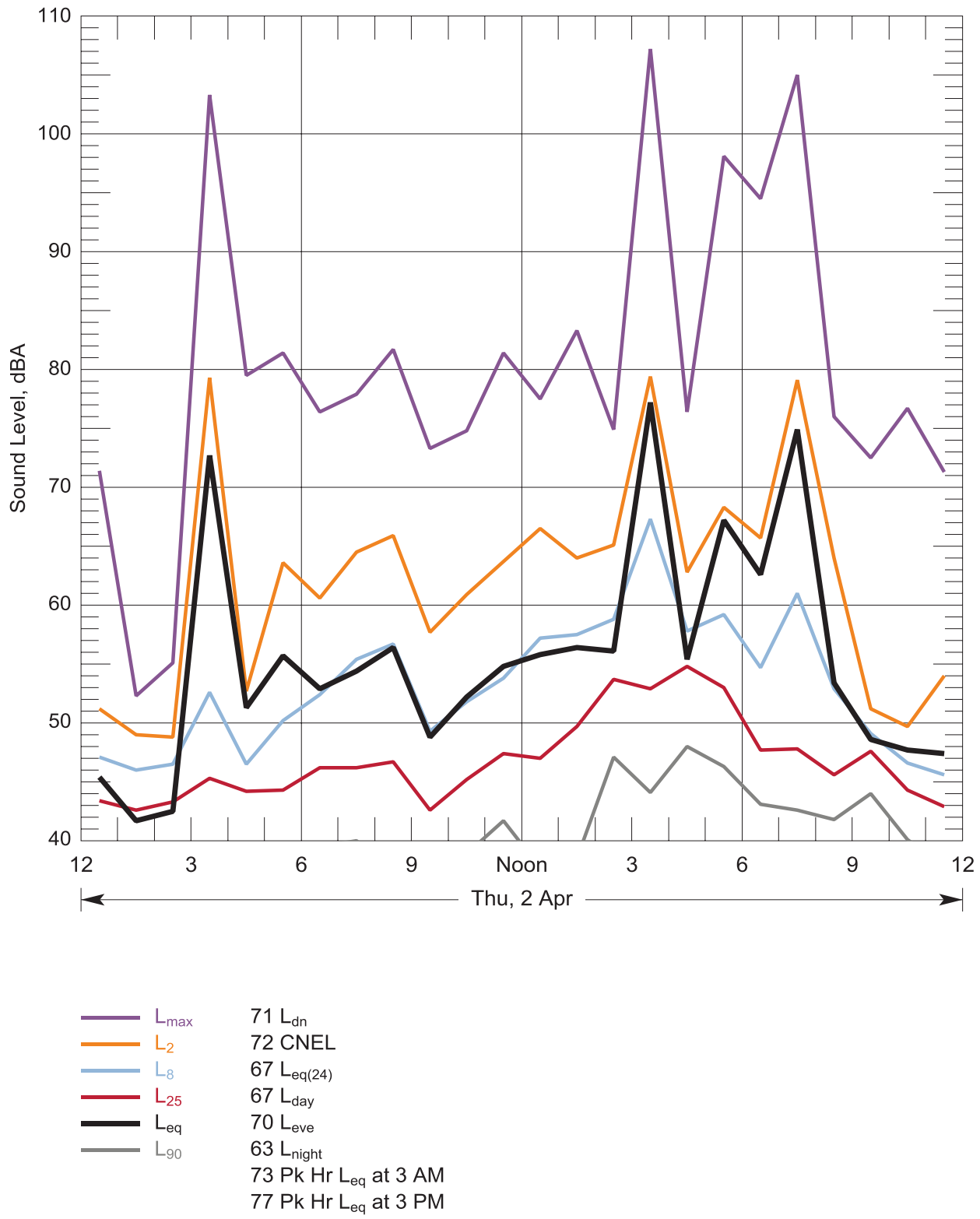

Figure 87: Hourly statistical summary of noise levels measured at Location 13 - 57 Hurd Rd, Elma on 02 Apr, 2015 and daily-average descriptors

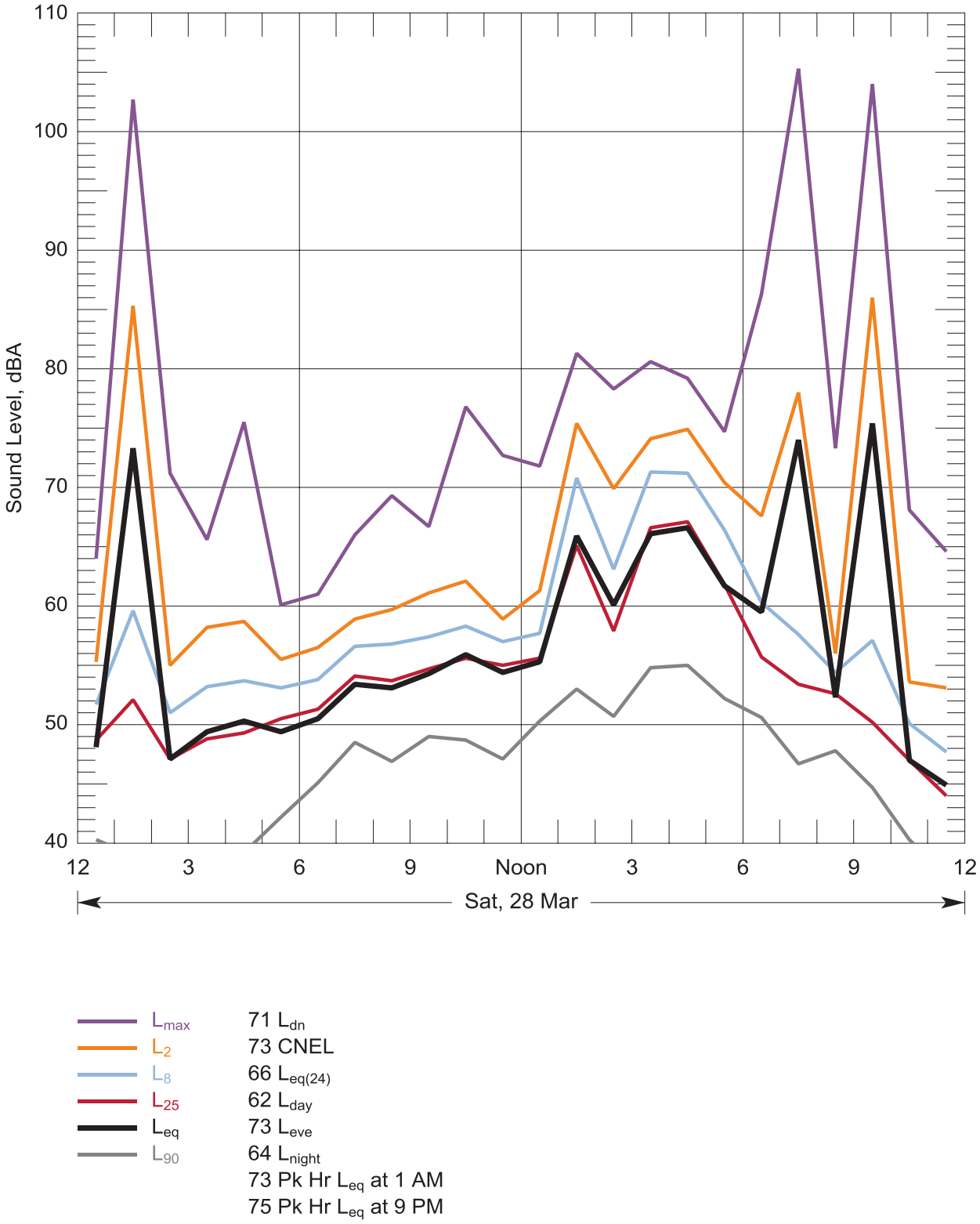

Figure 88: Hourly statistical summary of noise levels measured at Location 14 - 510 Foss Ave, Satsop on 28 Mar, 2015 and daily-average descriptors

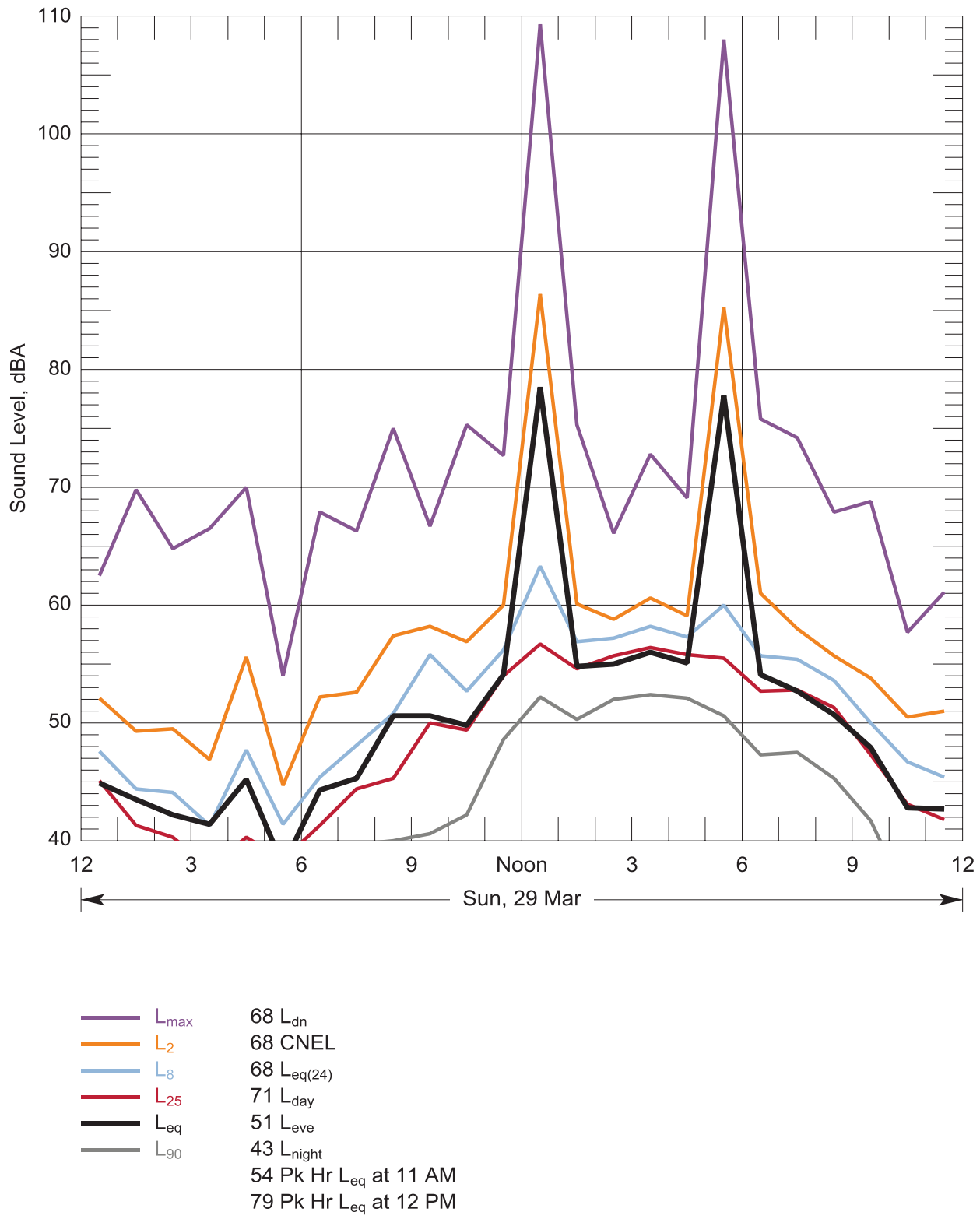

Figure 89: Hourly statistical summary of noise levels measured at Location 14 - 510 Foss Ave, Satsop on 29 Mar, 2015 and daily-average descriptors

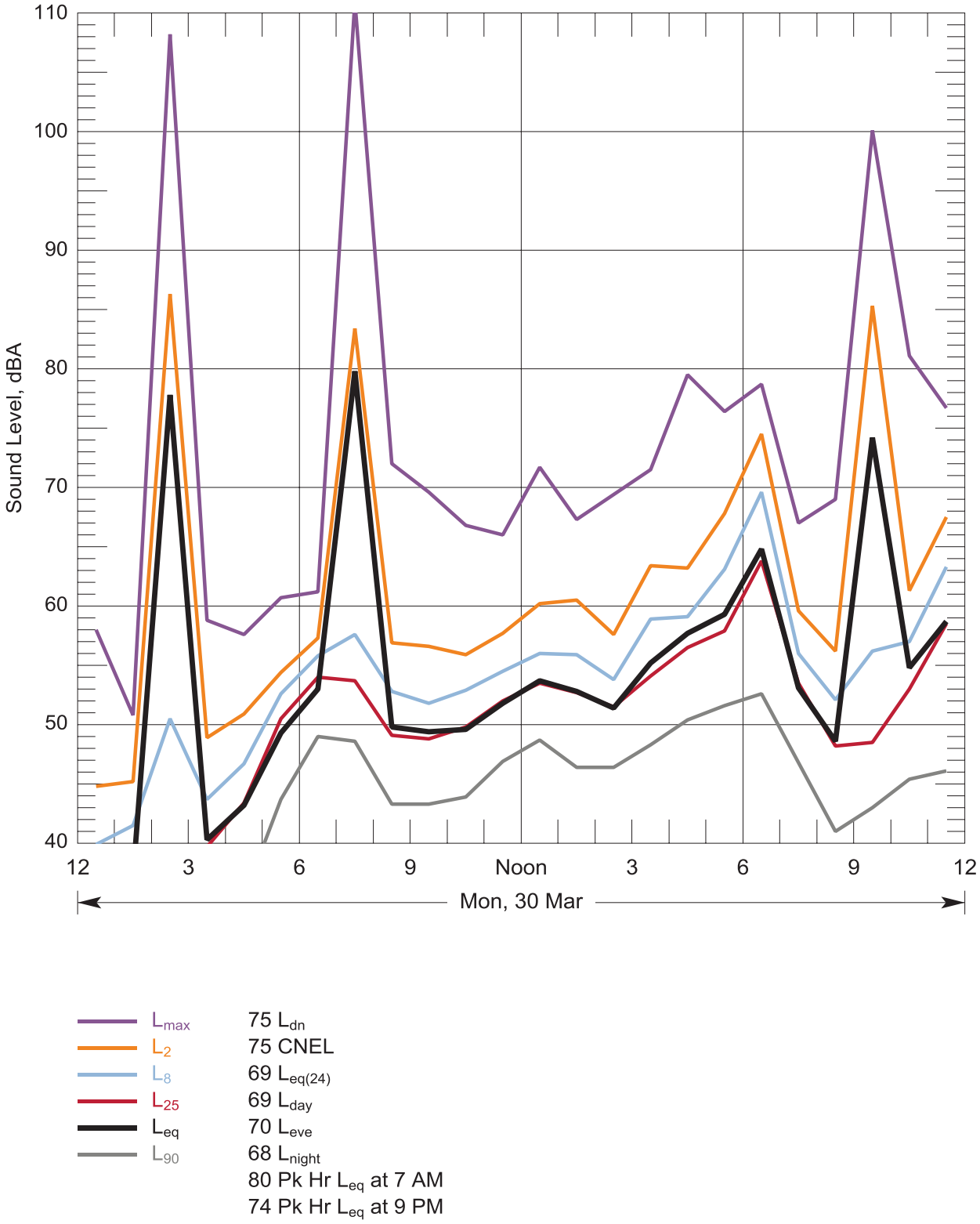

Figure 90: Hourly statistical summary of noise levels measured at Location 14 - 510 Foss Ave, Satsop on 30 Mar, 2015 and daily-average descriptors

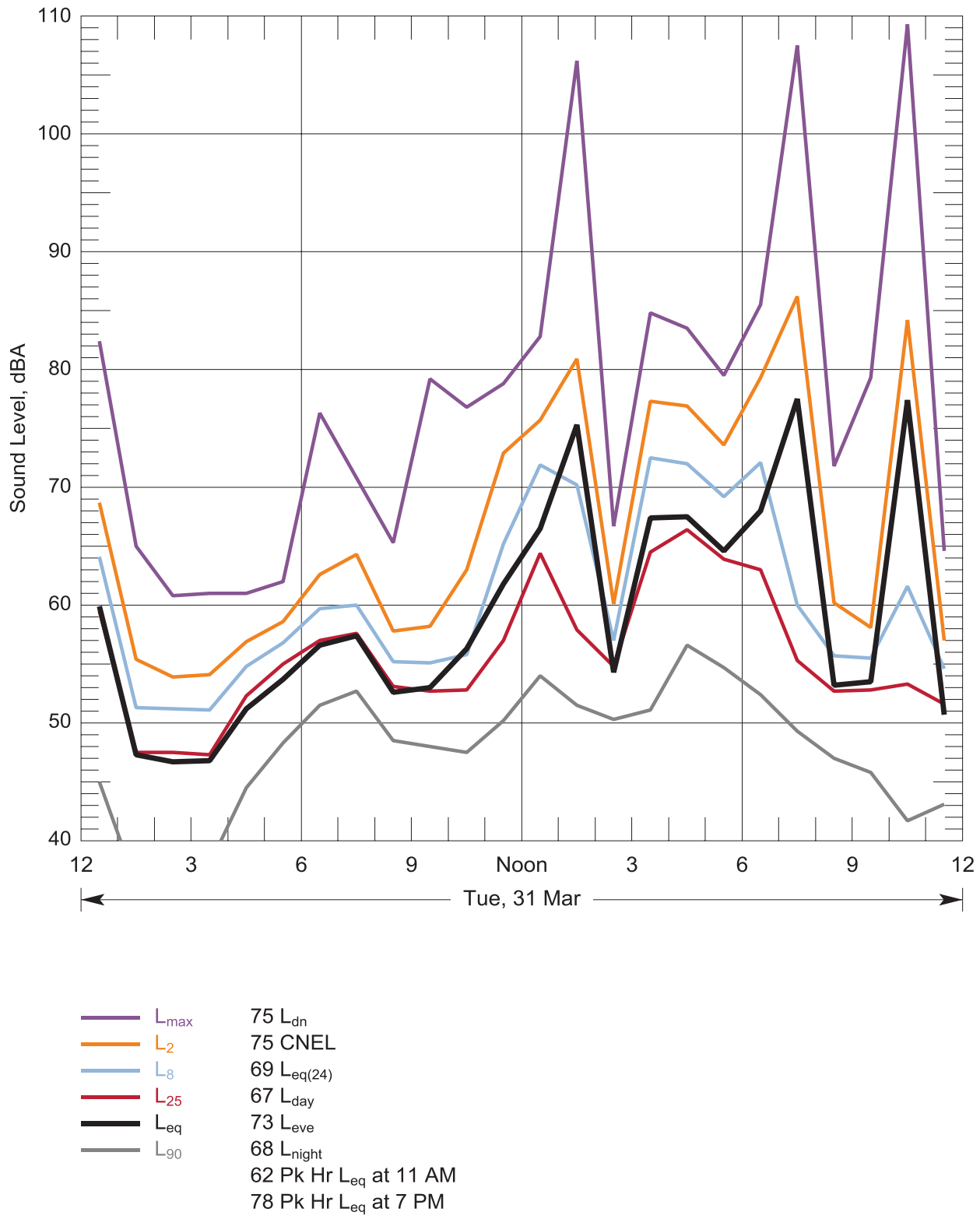

Figure 91: Hourly statistical summary of noise levels measured at Location 14 - 510 Foss Ave, Satsop on 31 Mar, 2015 and daily-average descriptors

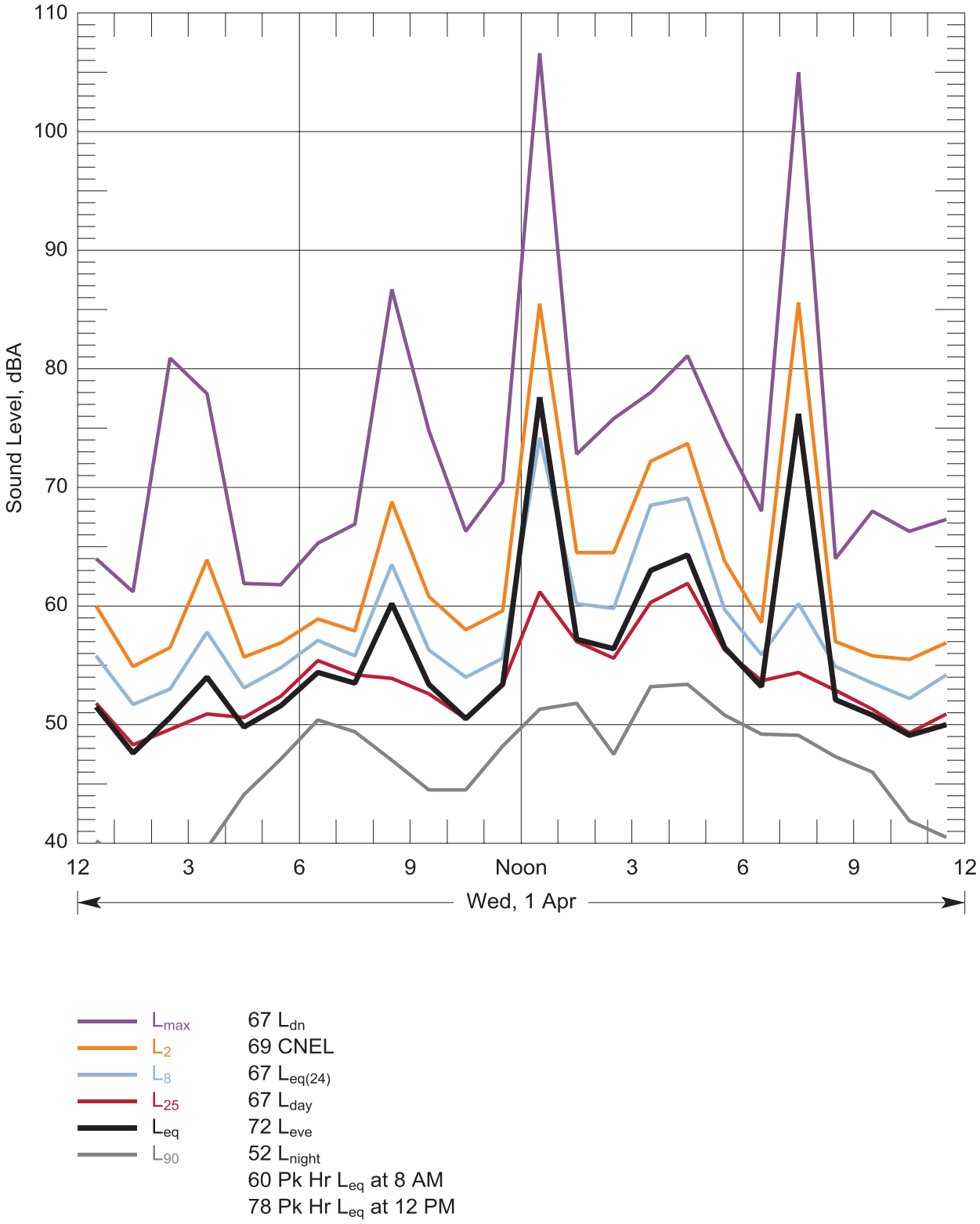

Figure 92: Hourly statistical summary of noise levels measured at Location 14 - 510 Foss Ave, Satsop on 01 Apr, 2015 and daily-average descriptors

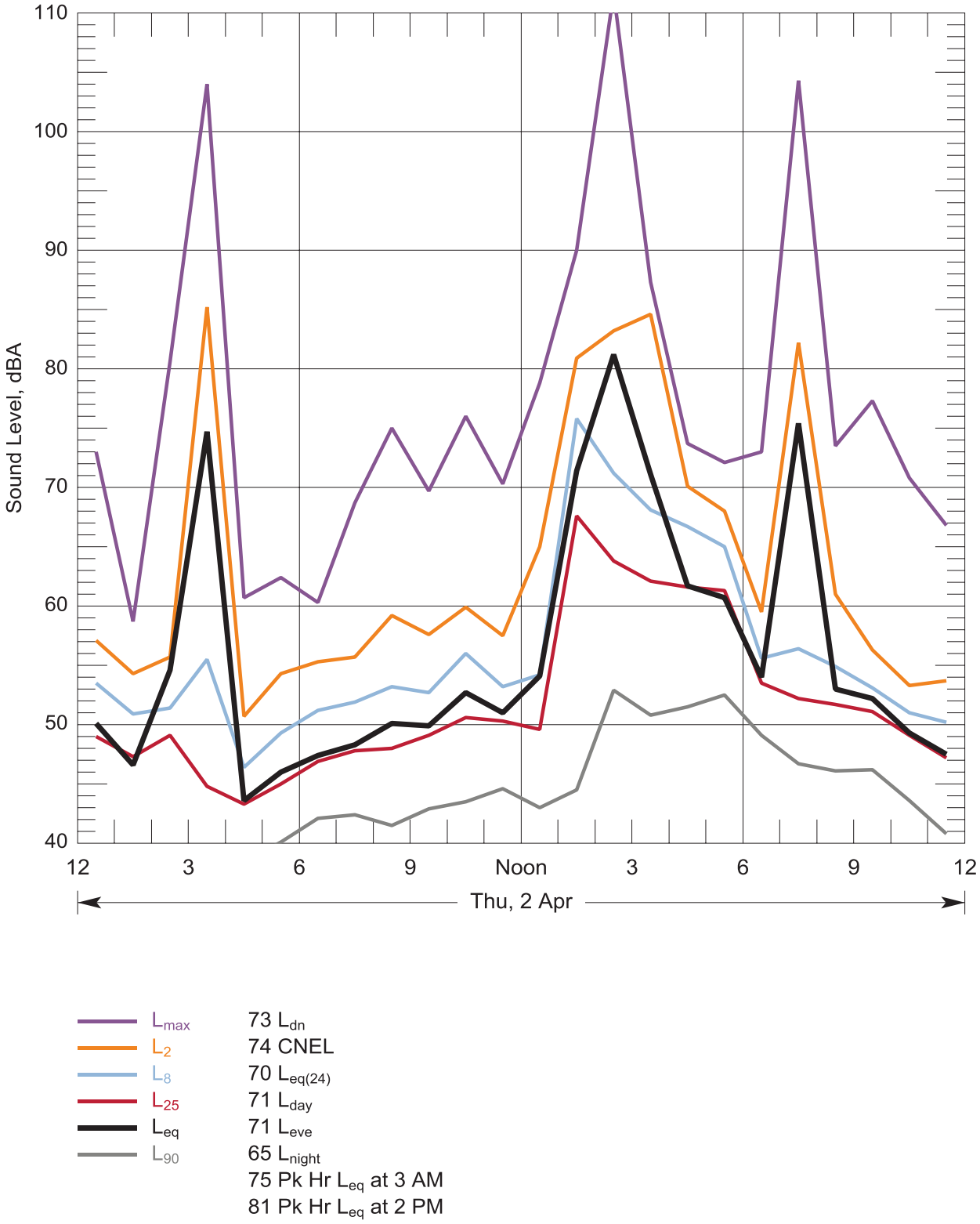

Figure 93: Hourly statistical summary of noise levels measured at Location 14 - 510 Foss Ave, Satsop on 02 Apr, 2015 and daily-average descriptors

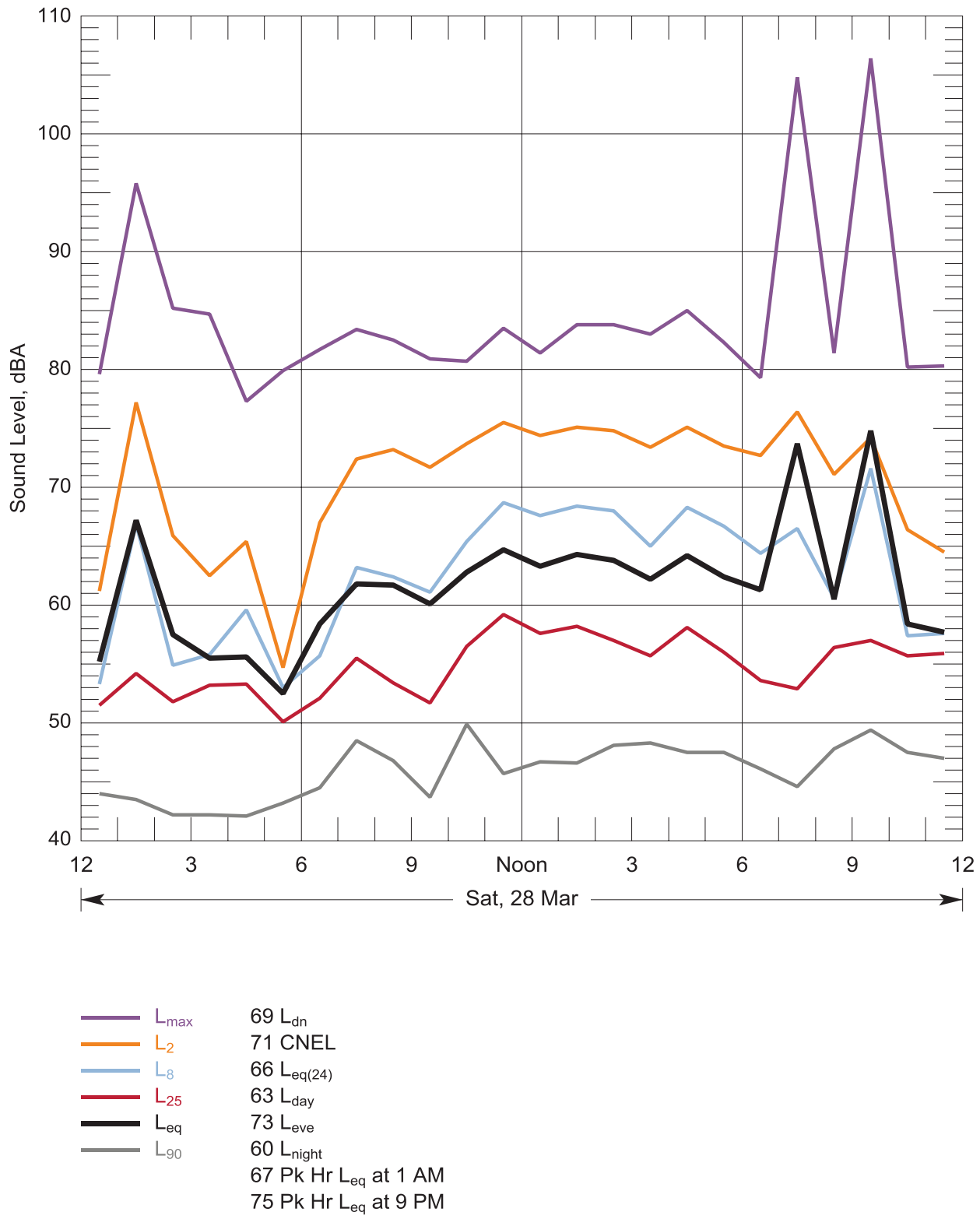

Figure 94: Hourly statistical summary of noise levels measured at Location 15 - 78 Devonshire, Montesano on 28 Mar, 2015 and daily-average descriptors

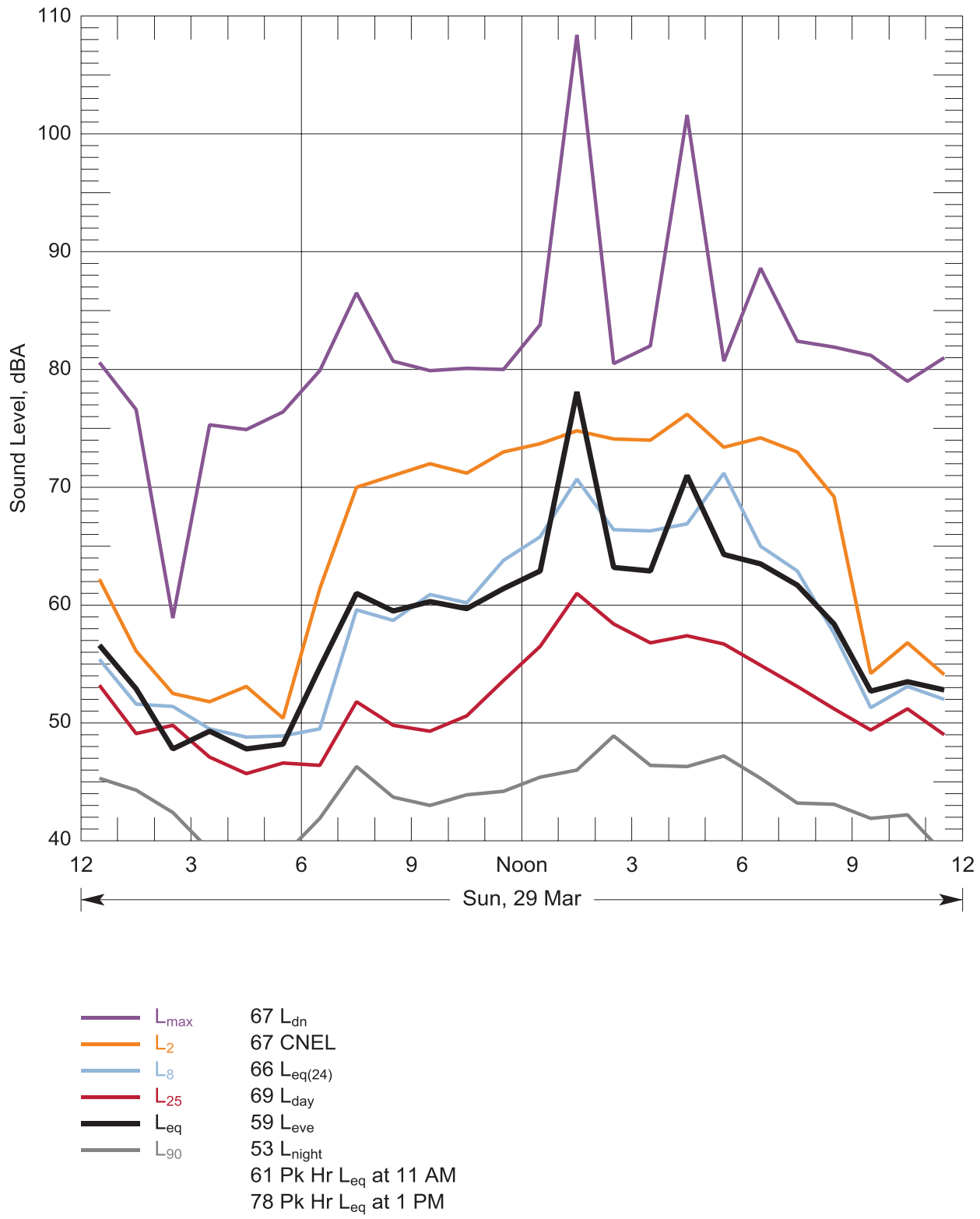

Figure 95: Hourly statistical summary of noise levels measured at Location 15 - 78 Devonshire, Montesano on 29 Mar, 2015 and daily-average descriptors

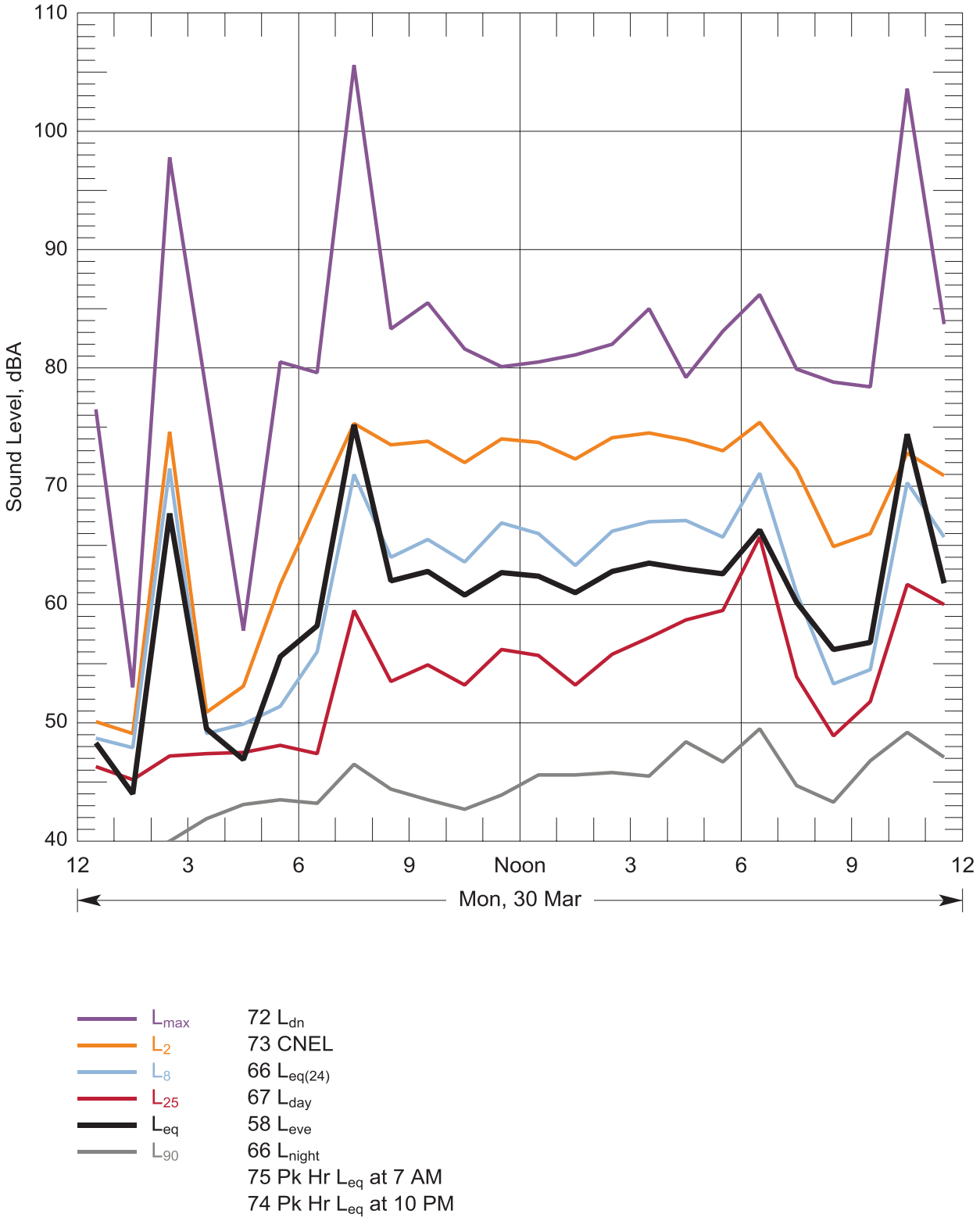

Figure 96: Hourly statistical summary of noise levels measured at Location 15 - 78 Devonshire, Montesano on 30 Mar, 2015 and daily-average descriptors

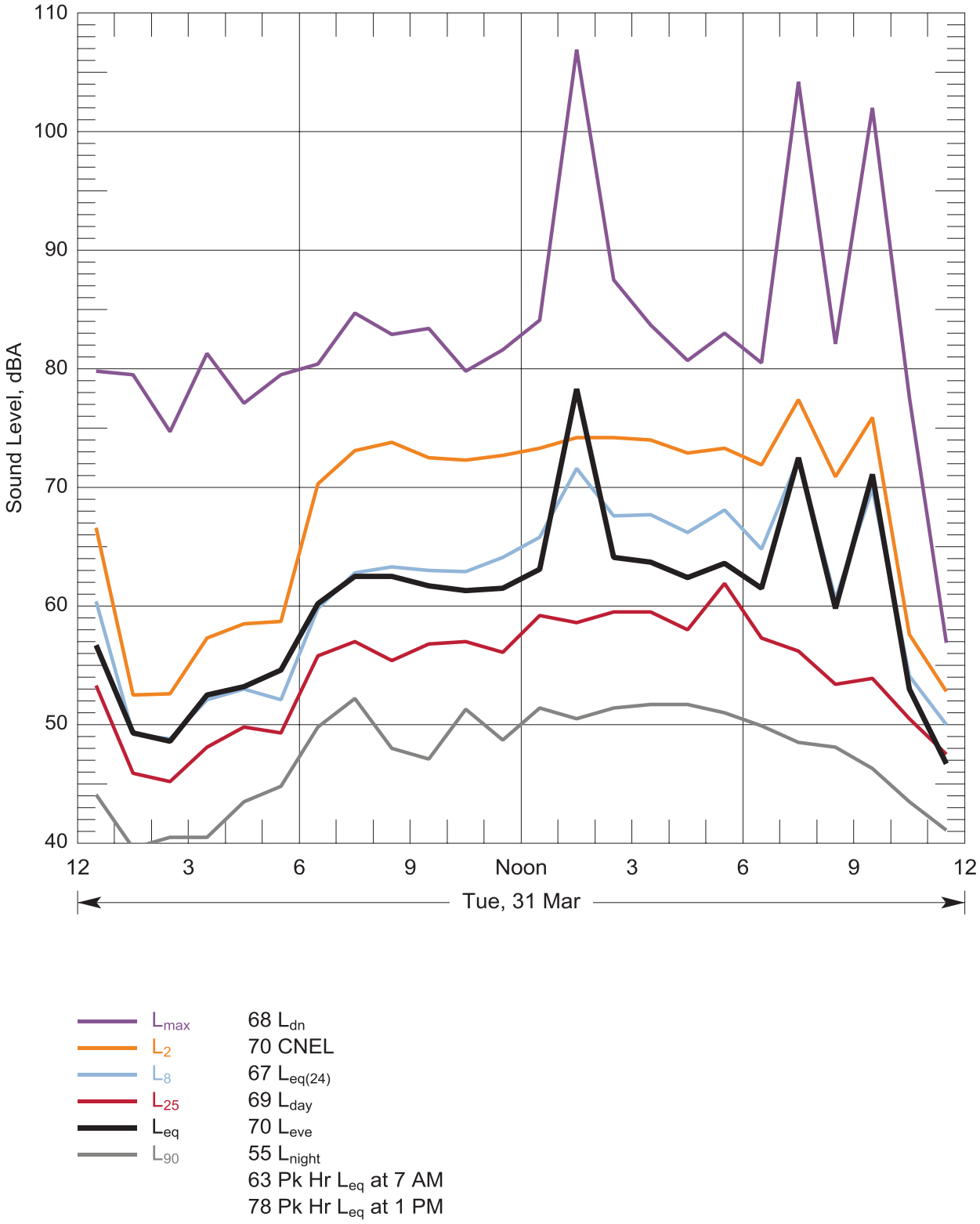

Figure 97: Hourly statistical summary of noise levels measured at Location 15 - 78 Devonshire, Montesano on 31 Mar, 2015 and daily-average descriptors

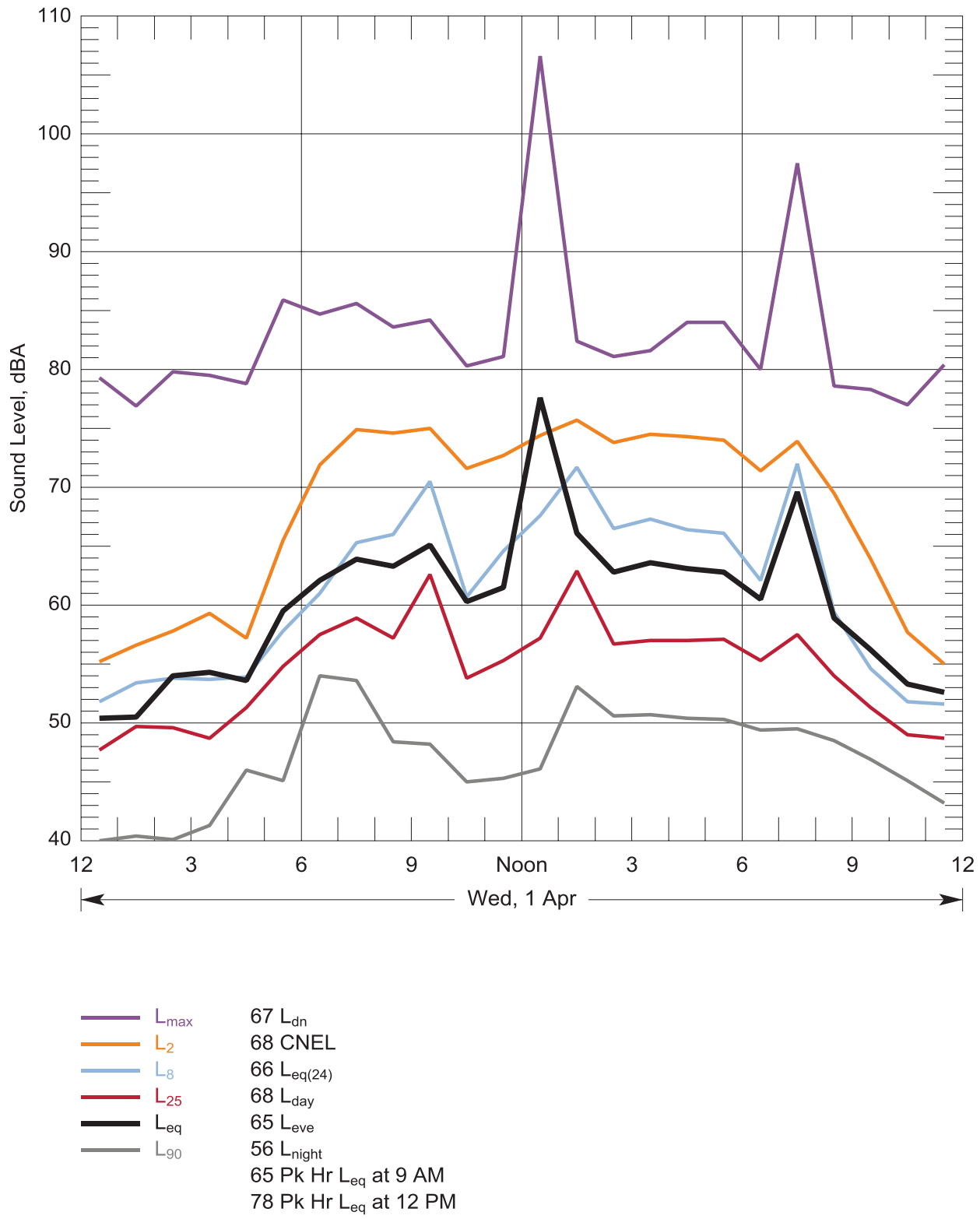

Figure 98: Hourly statistical summary of noise levels measured at Location 15 - 78 Devonshire, Montesano on 01 Apr, 2015 and daily-average descriptors

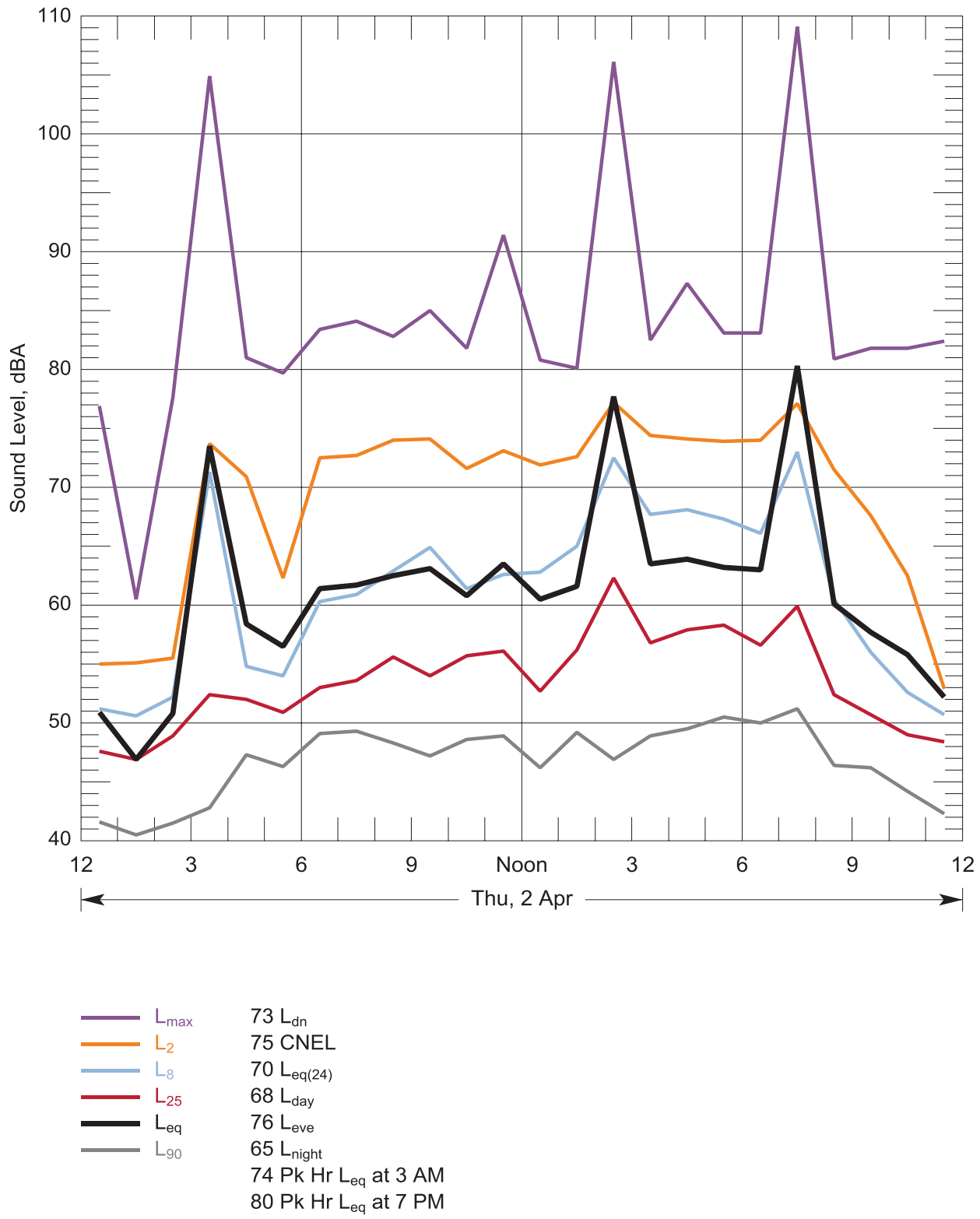

Figure 99: Hourly statistical summary of noise levels measured at Location 15 - 78 Devonshire, Montesano on 02 Apr, 2015 and daily-average descriptors

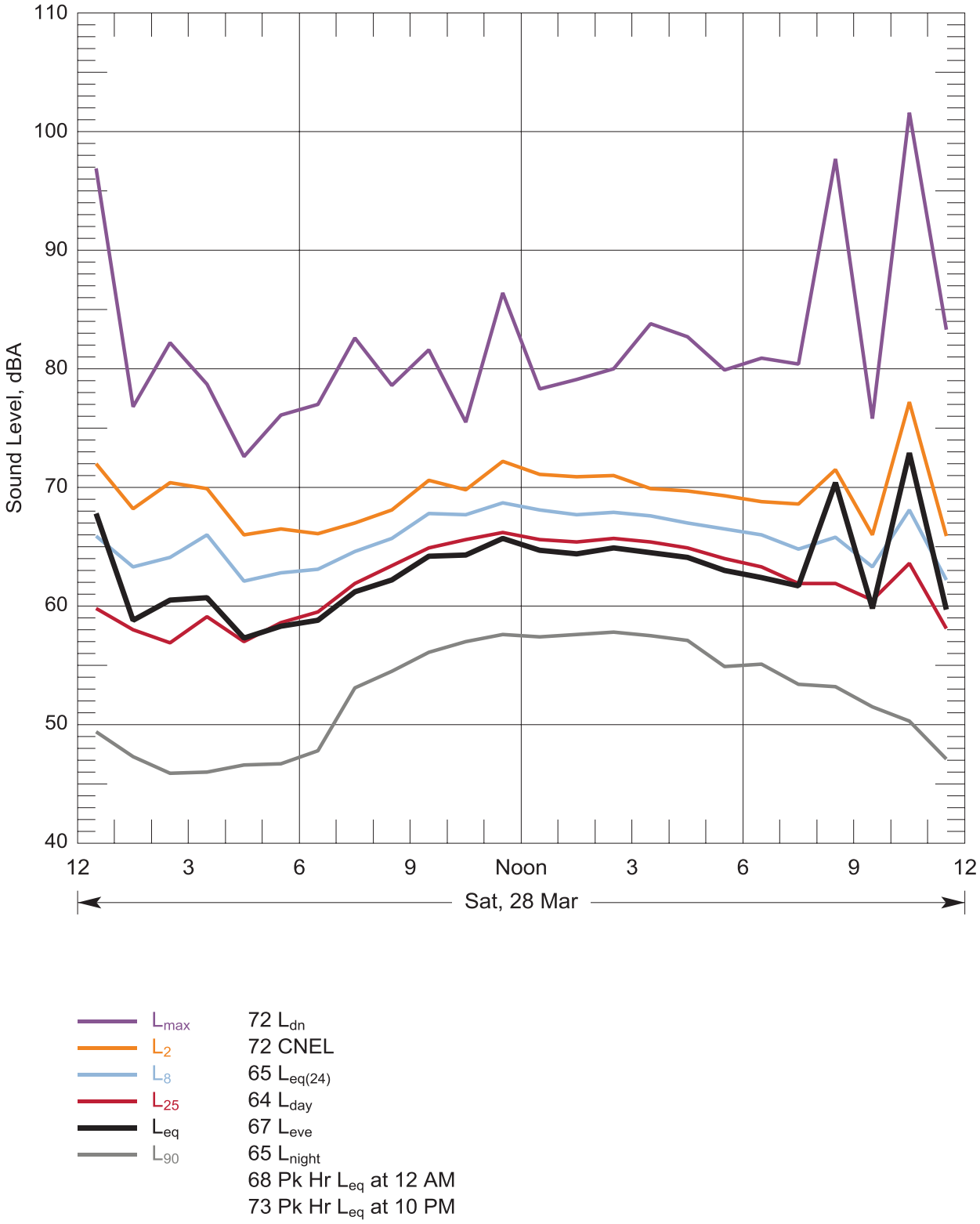

Figure 100: Hourly statistical summary of noise levels measured at Location 16 - 140 S Chehalis St, Aberdeen on 28 Mar, 2015 and daily-average descriptors

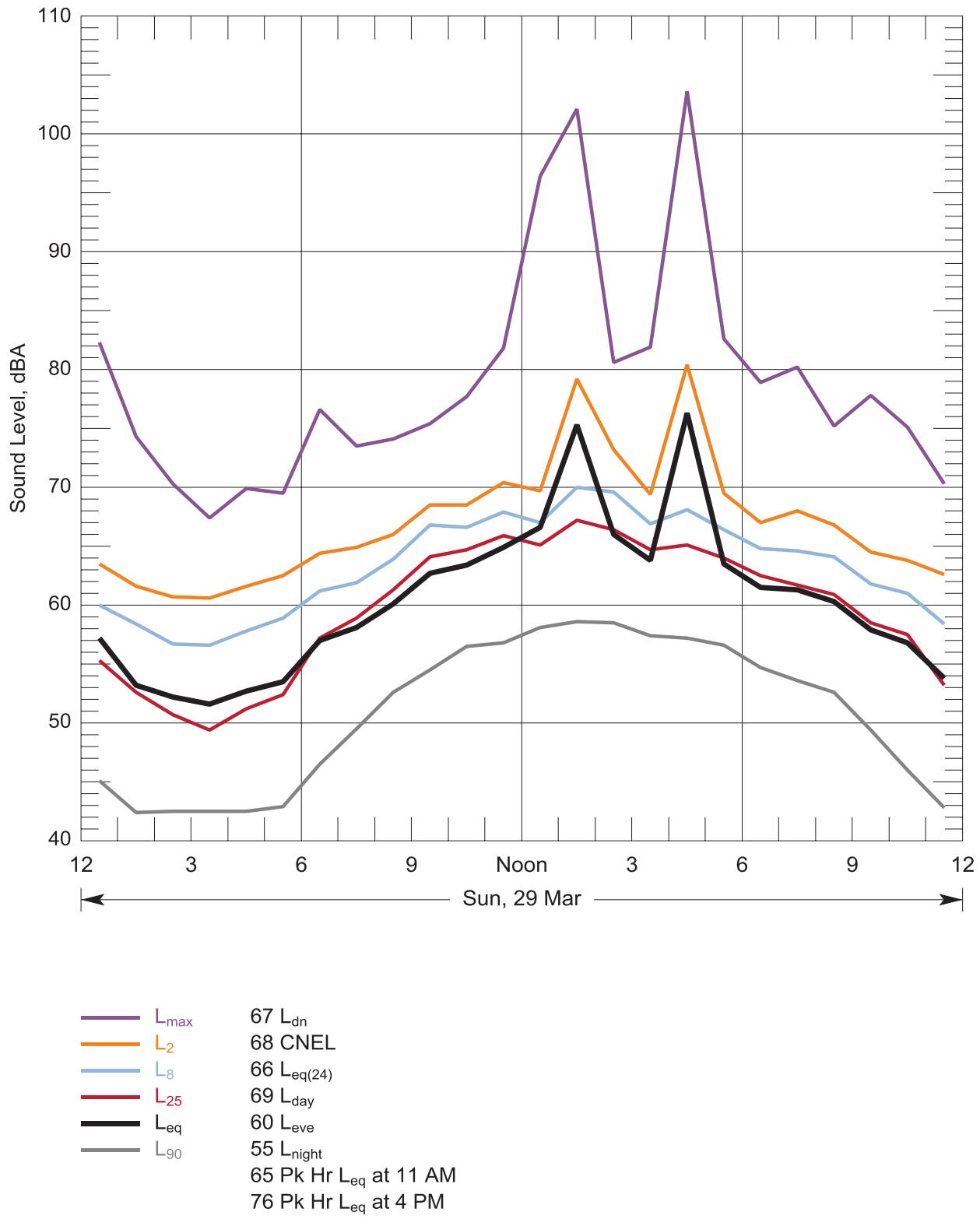

Figure 101: Hourly statistical summary of noise levels measured at Location 16 - 140 S Chehalis St, Aberdeen on 29 Mar, 2015 and daily-average descriptors

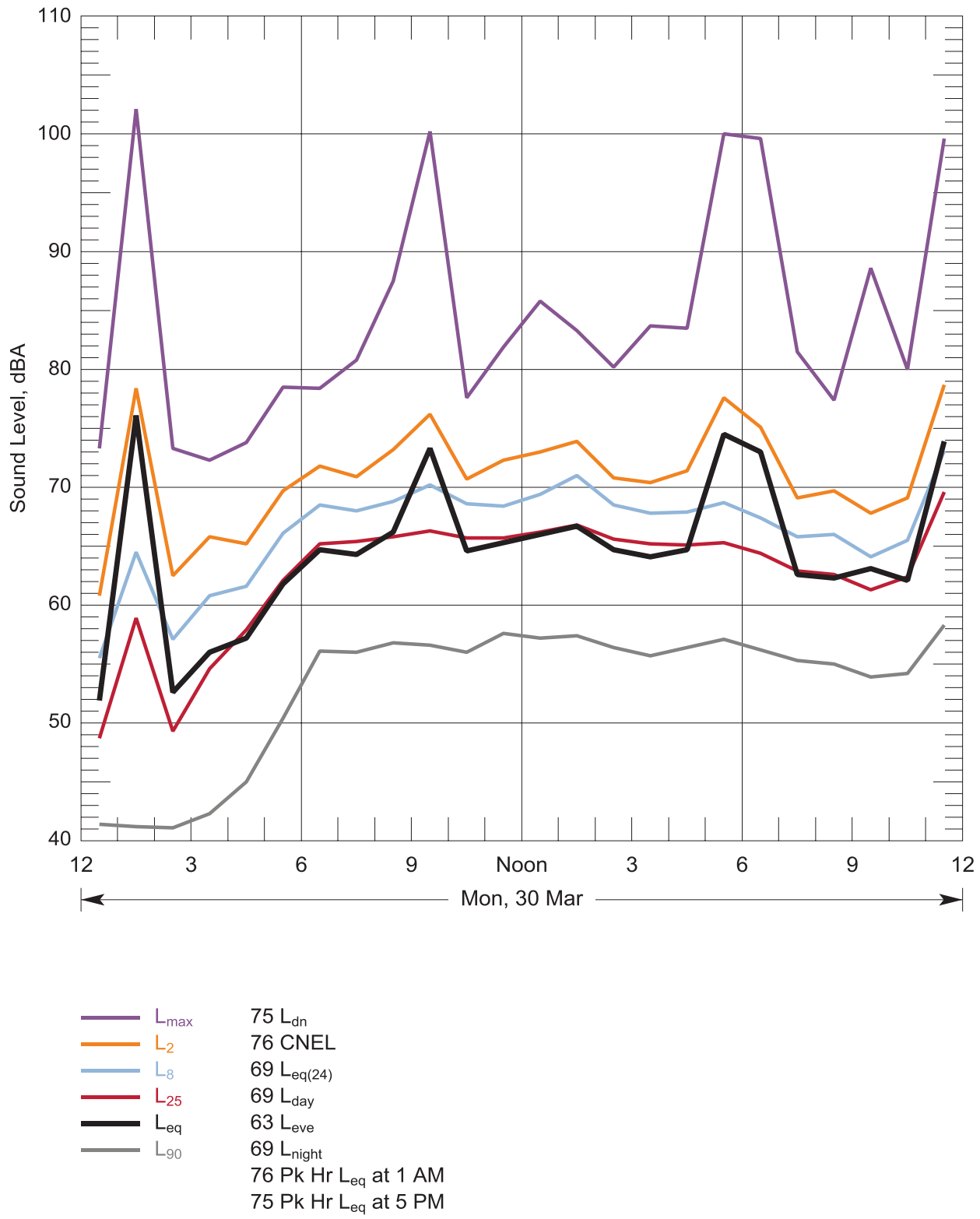

Figure 102: Hourly statistical summary of noise levels measured at Location 16 - 140 S Chehalis St, Aberdeen on 30 Mar, 2015 and daily-average descriptors

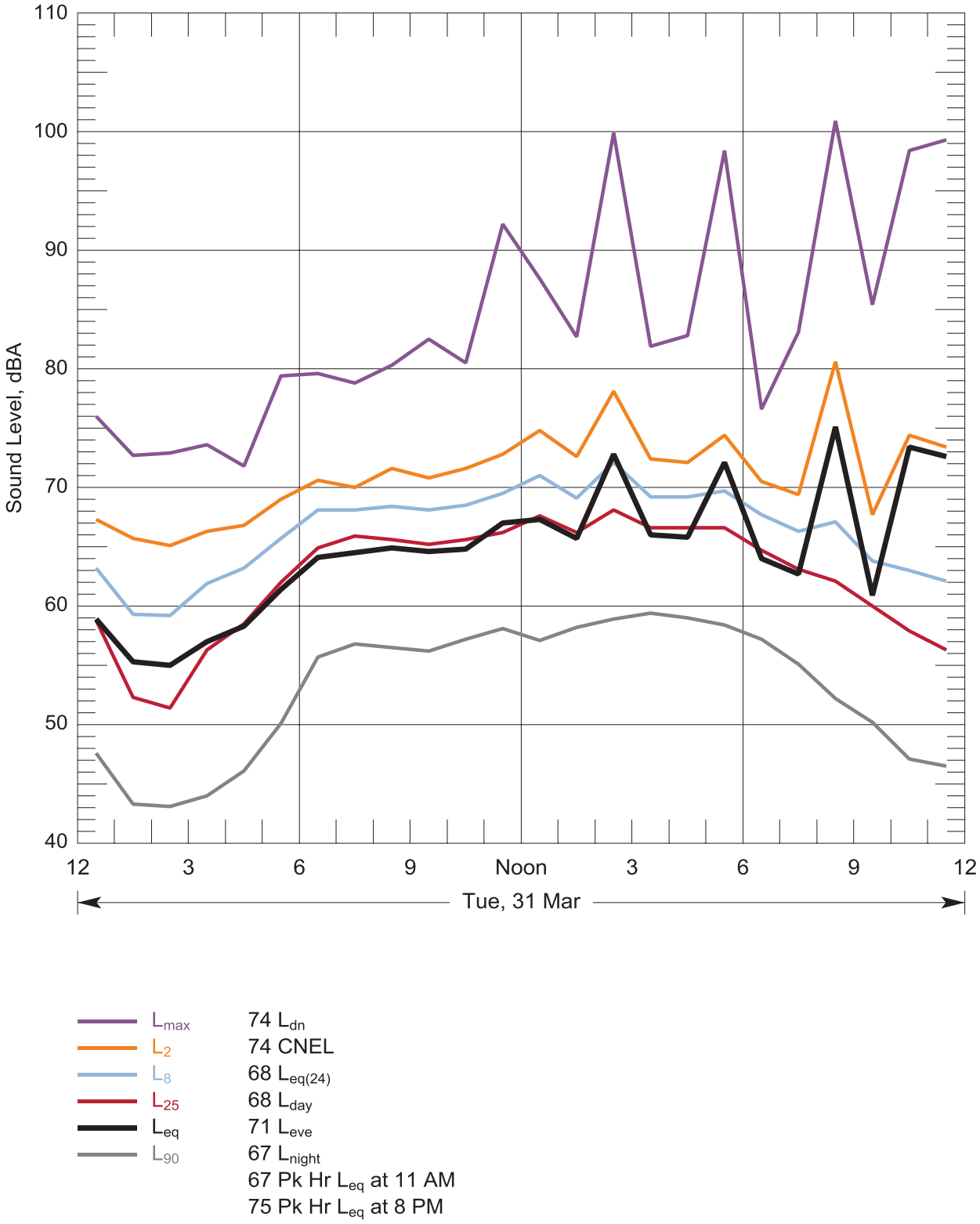

Figure 103: Hourly statistical summary of noise levels measured at Location 16 - 140 S Chehalis St, Aberdeen on 31 Mar, 2015 and daily-average descriptors

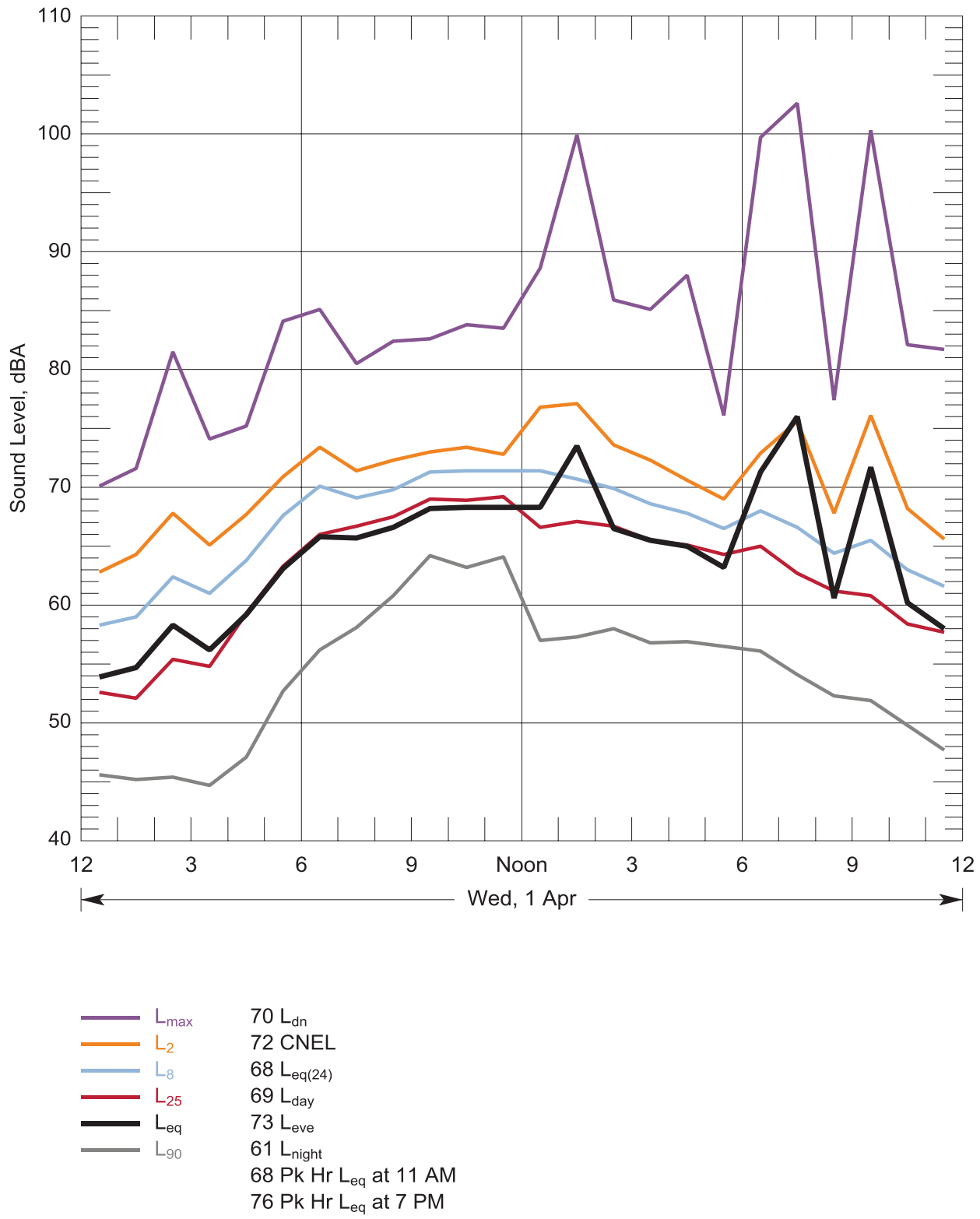

Figure 104: Hourly statistical summary of noise levels measured at Location 16 - 140 S Chehalis St, Aberdeen on 01 Apr, 2015 and daily-average descriptors

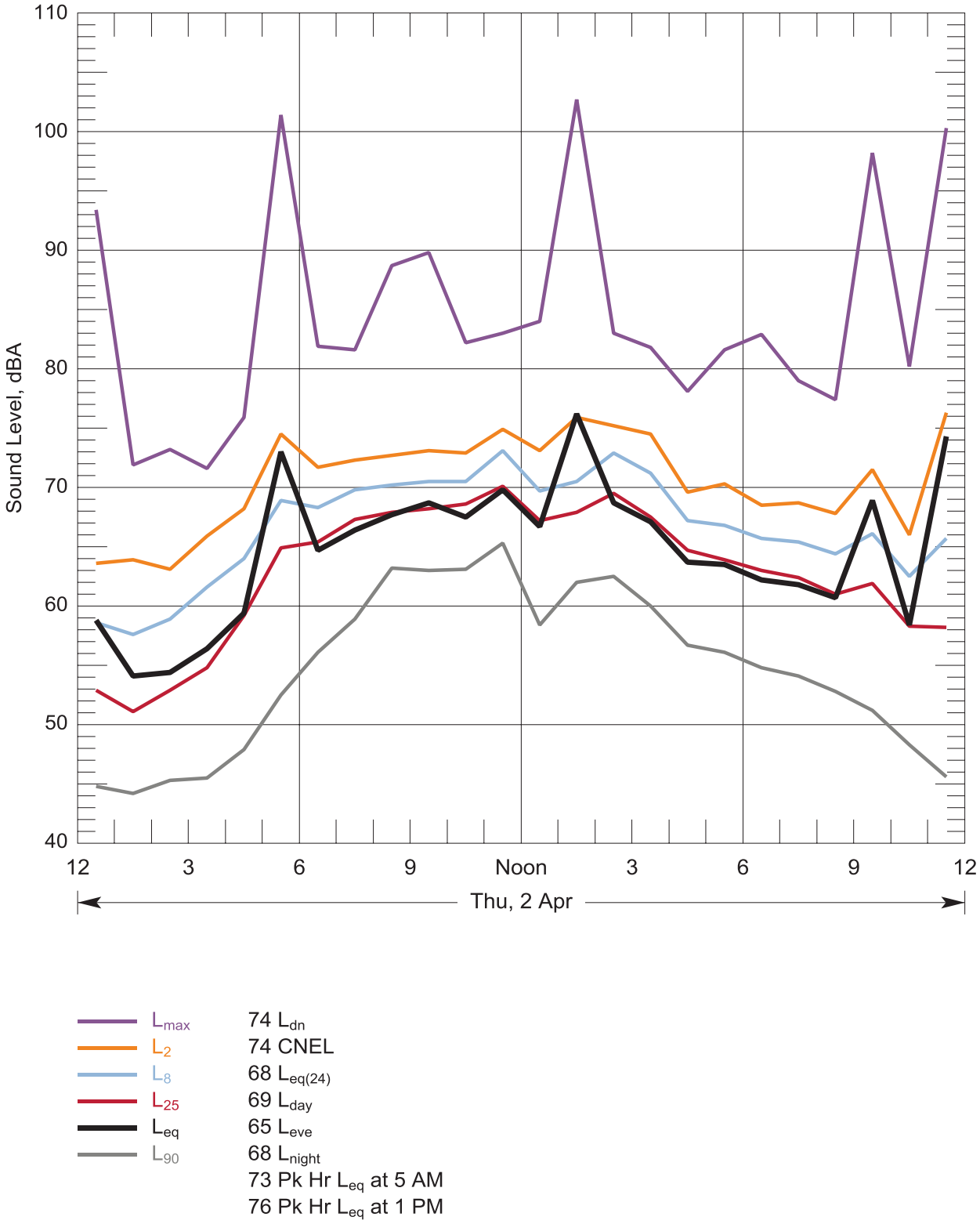

Figure 105: Hourly statistical summary of noise levels measured at Location 16 - 140 S Chehalis St, Aberdeen on 02 Apr, 2015 and daily-average descriptors

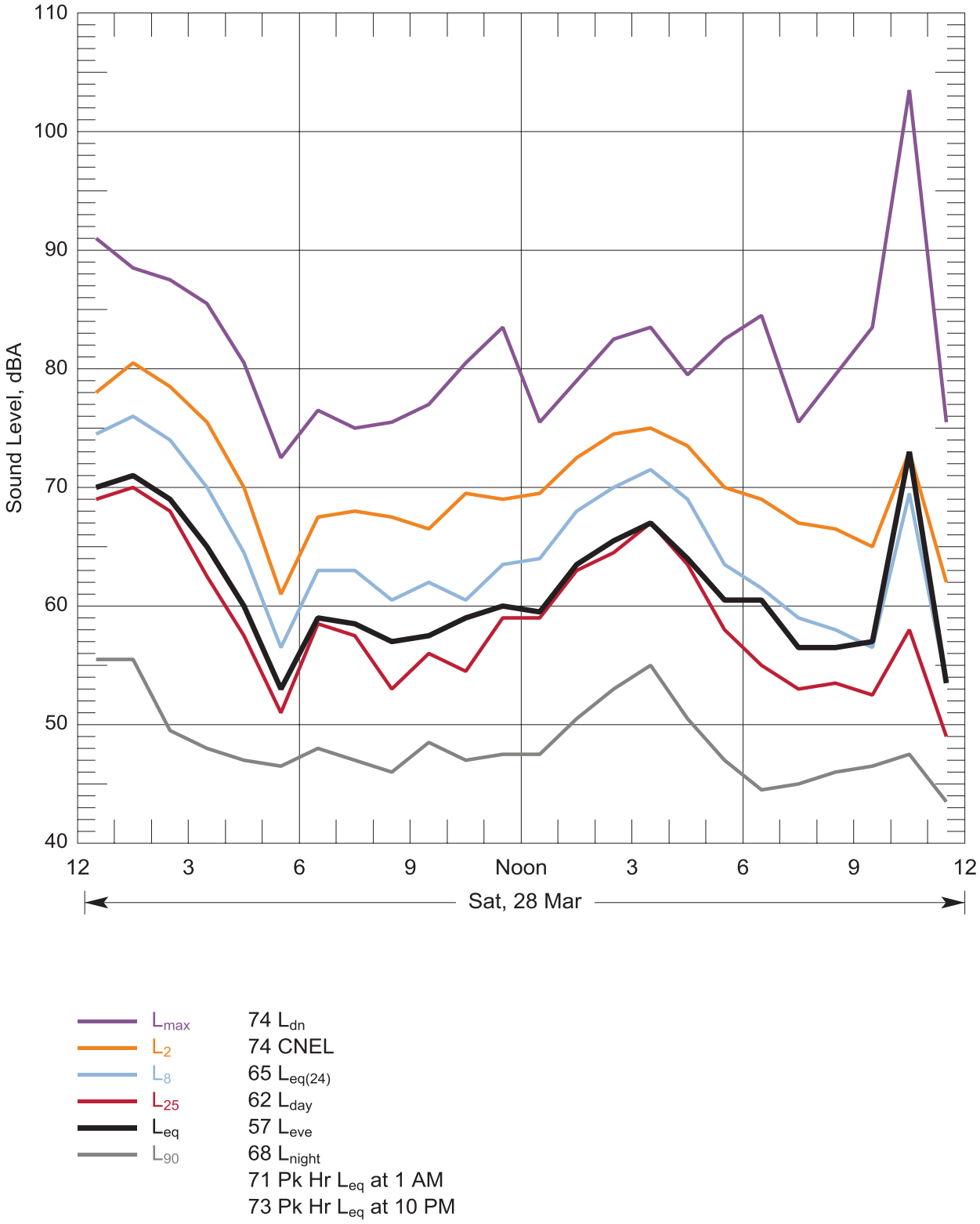

Figure 106: Hourly statistical summary of noise levels measured at Location 18 - 2100 1st Street, Aberdeen on 28 Mar, 2015 and daily-average descriptors

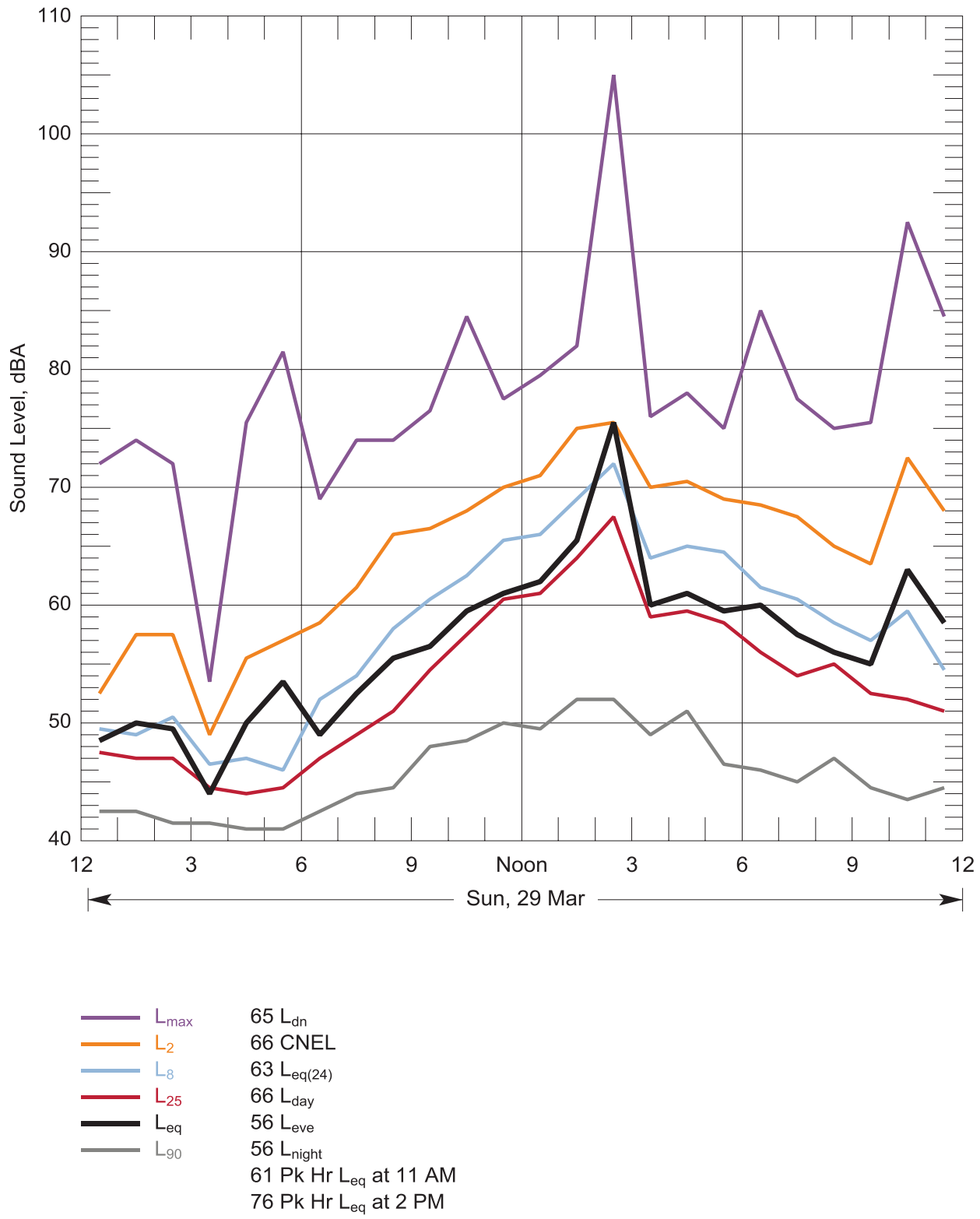

Figure 107: Hourly statistical summary of noise levels measured at Location 18 - 2100 1st Street, Aberdeen on 29 Mar, 2015 and daily-average descriptors

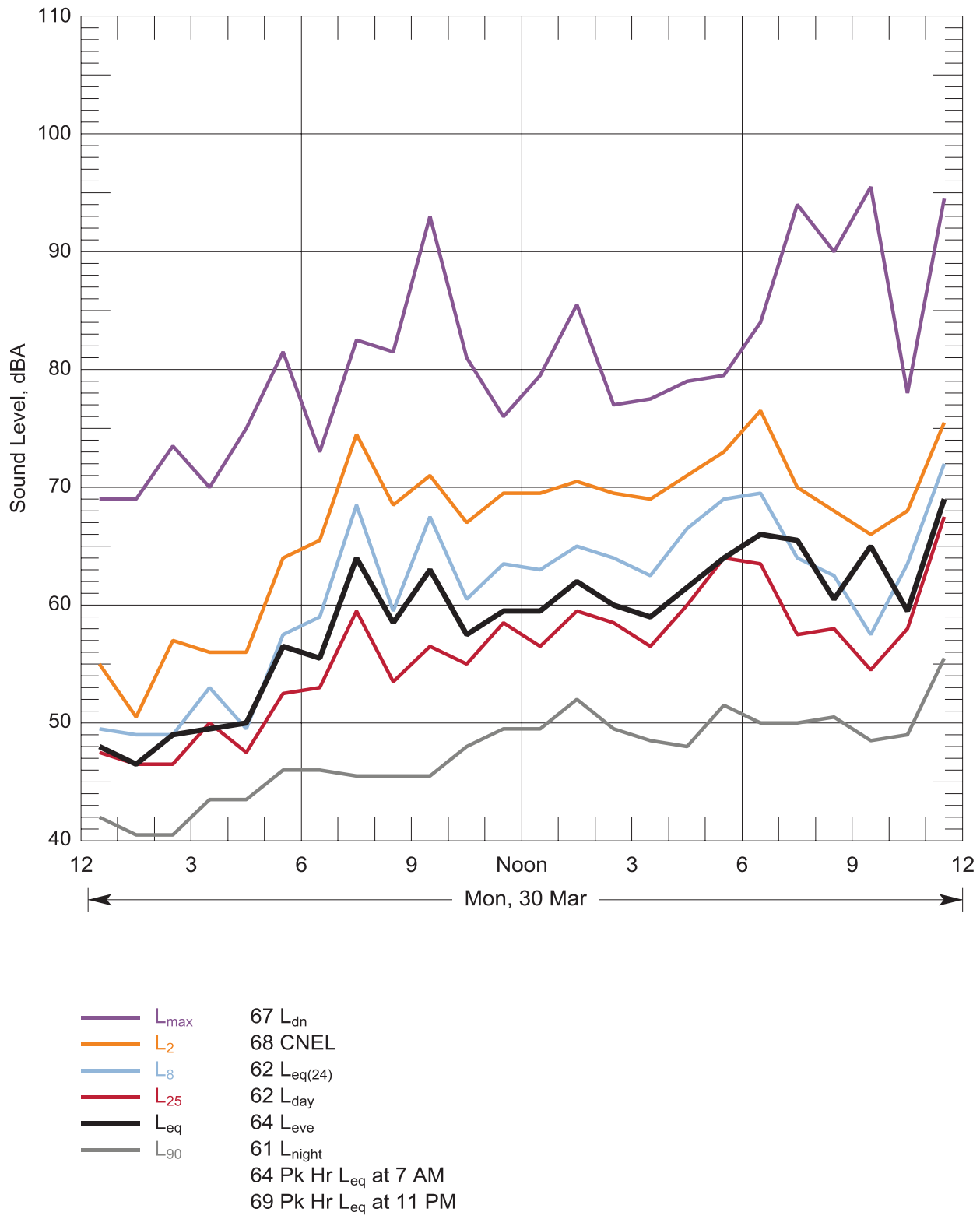

Figure 108: Hourly statistical summary of noise levels measured at Location 18 - 2100 1st Street, Aberdeen on 30 Mar, 2015 and daily-average descriptors

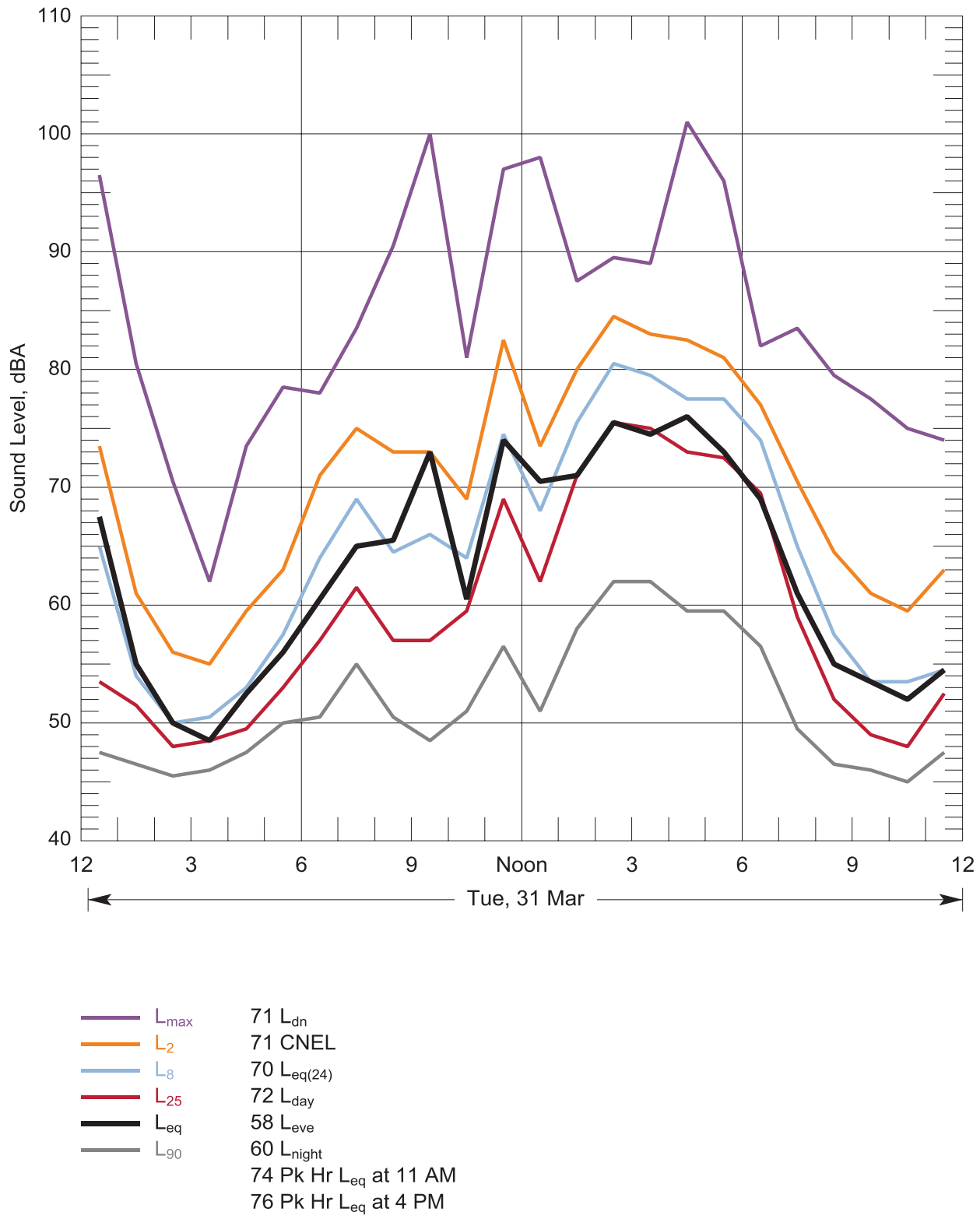

Figure 109: Hourly statistical summary of noise levels measured at Location 18 - 2100 1st Street, Aberdeen on 31 Mar, 2015 and daily-average descriptors

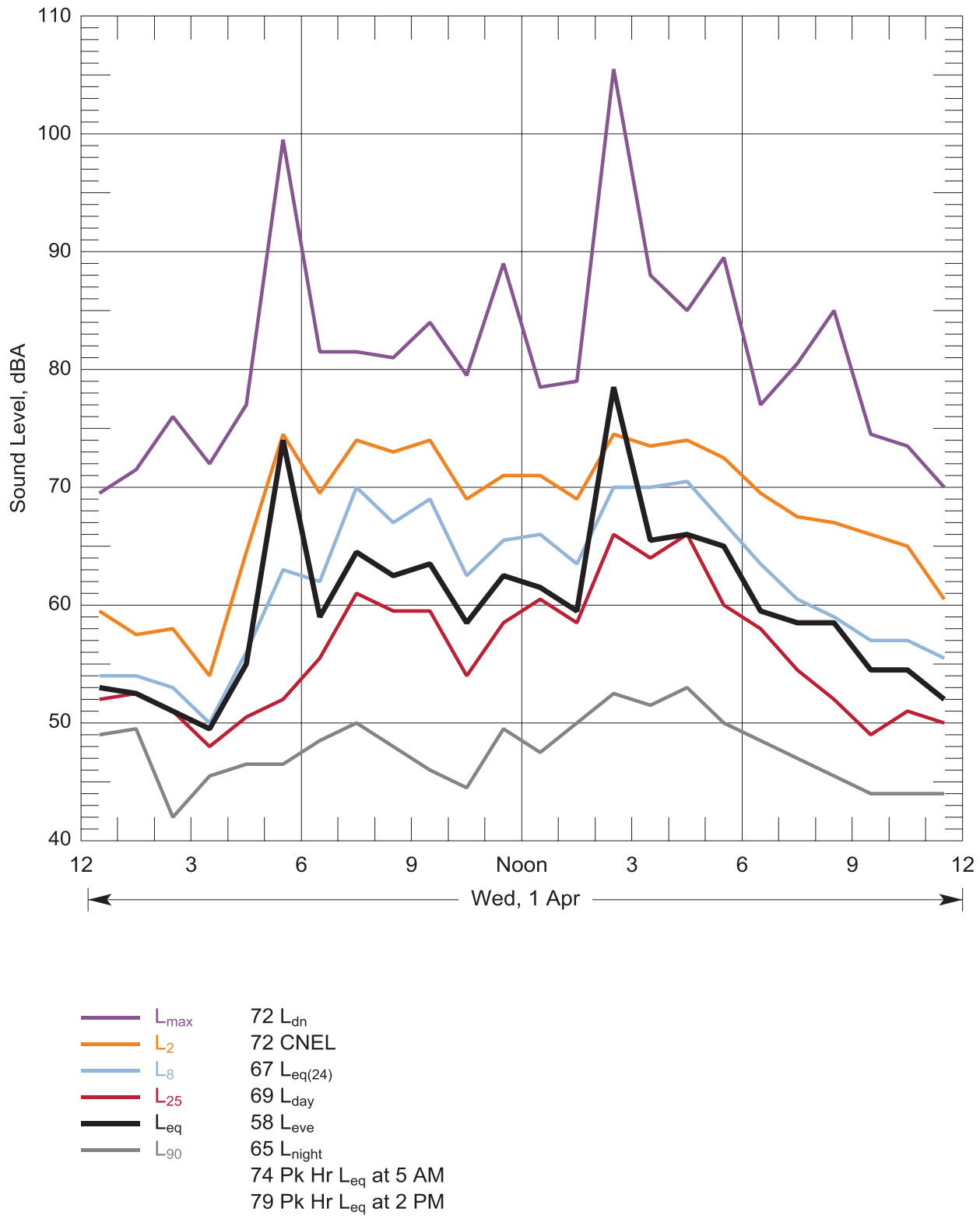

Figure 110: Hourly statistical summary of noise levels measured at Location 18 - 2100 1st Street, Aberdeen on 01 Apr, 2015 and daily-average descriptors

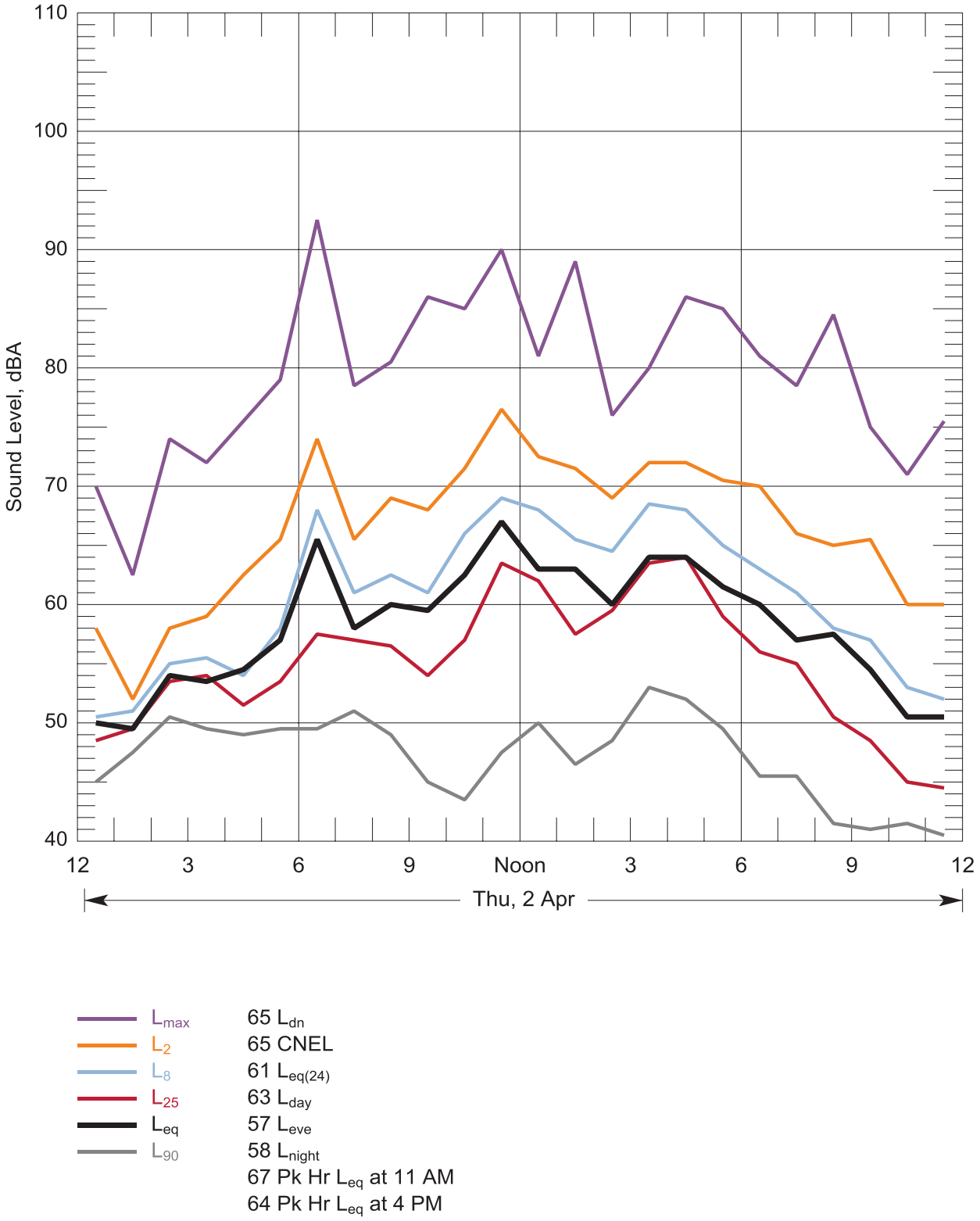

Figure 111: Hourly statistical summary of noise levels measured at Location 18 - 2100 1st Street, Aberdeen on 02 Apr, 2015 and daily-average descriptors

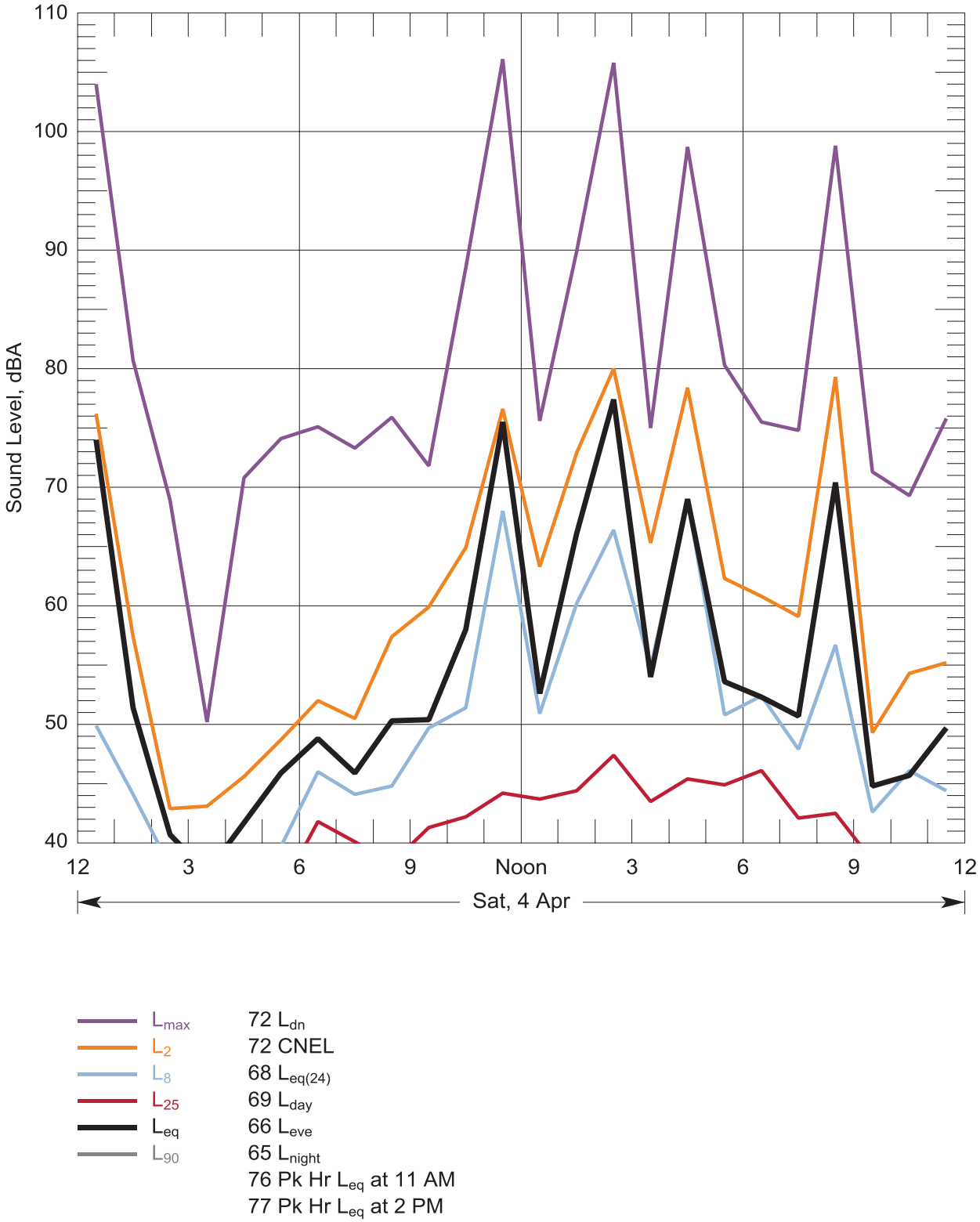

Figure 112: Hourly statistical summary of noise levels measured at Location 19 - 11846 170th Ave SW, Rochester on 04 Apr, 2015 and daily-average descriptors

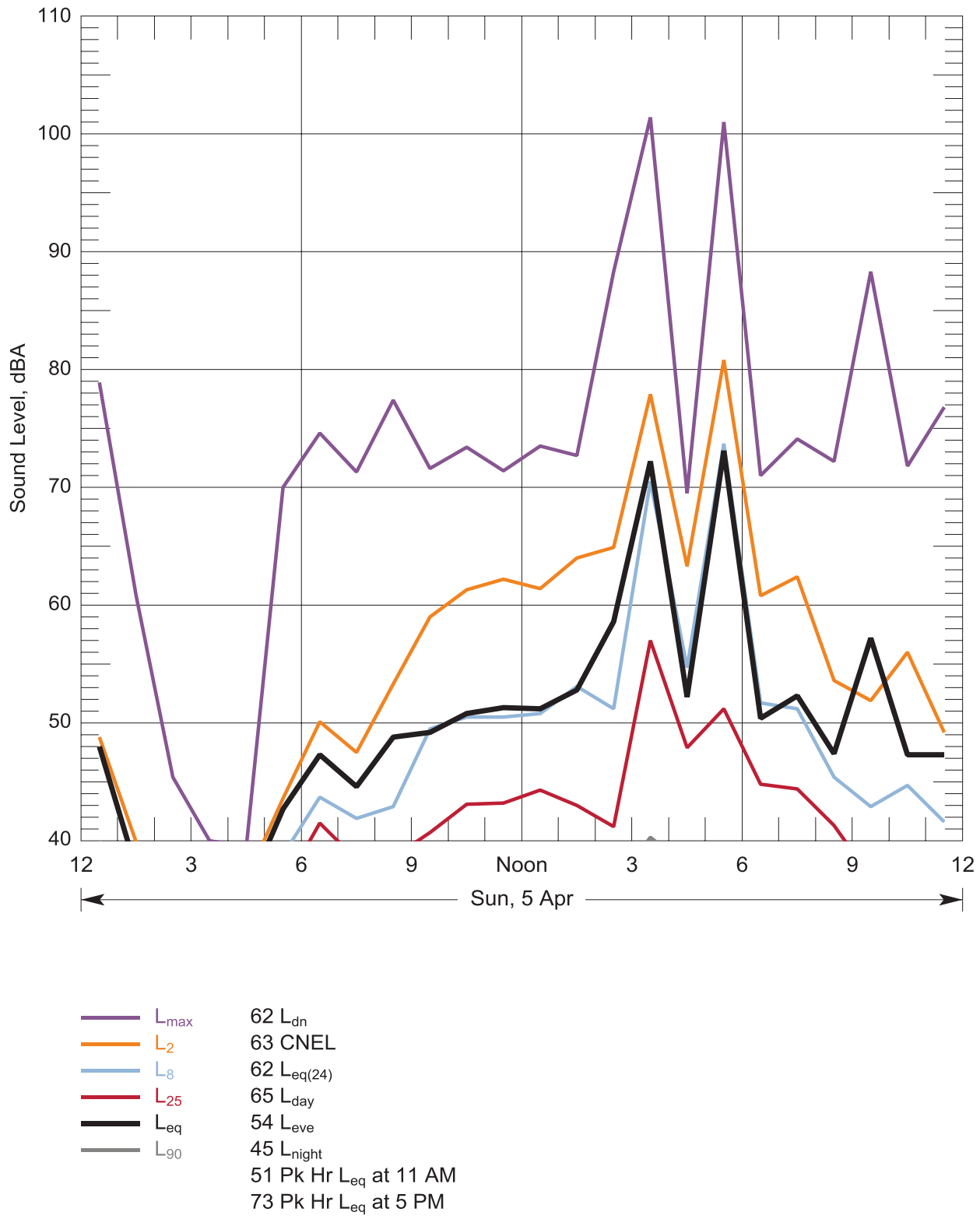

Figure 113: Hourly statistical summary of noise levels measured at Location 19 - 11846 170th Ave SW, Rochester on 05 Apr, 2015 and daily-average descriptors

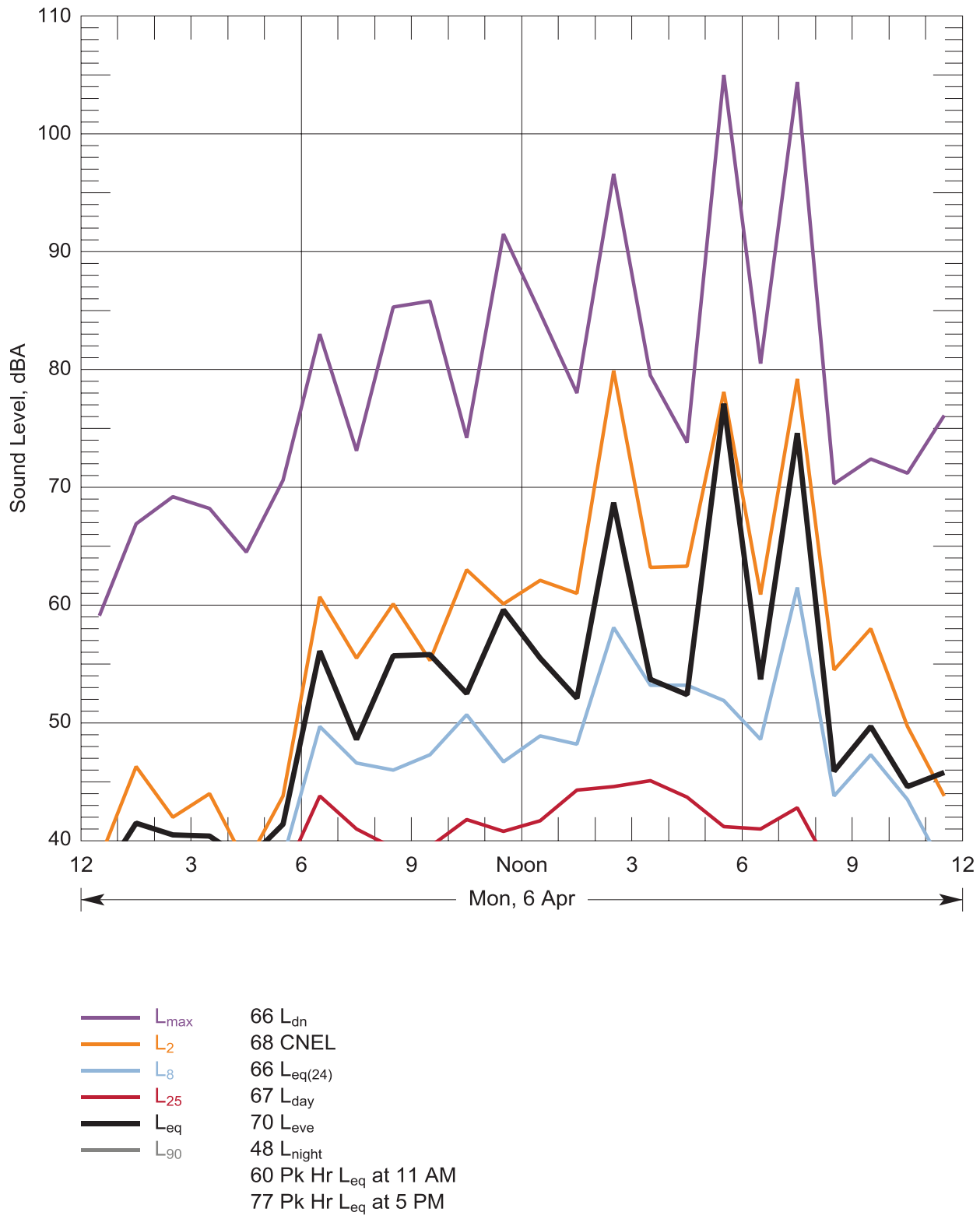

Figure 114: Hourly statistical summary of noise levels measured at Location 19 - 11846 170th Ave SW, Rochester on 06 Apr, 2015 and daily-average descriptors

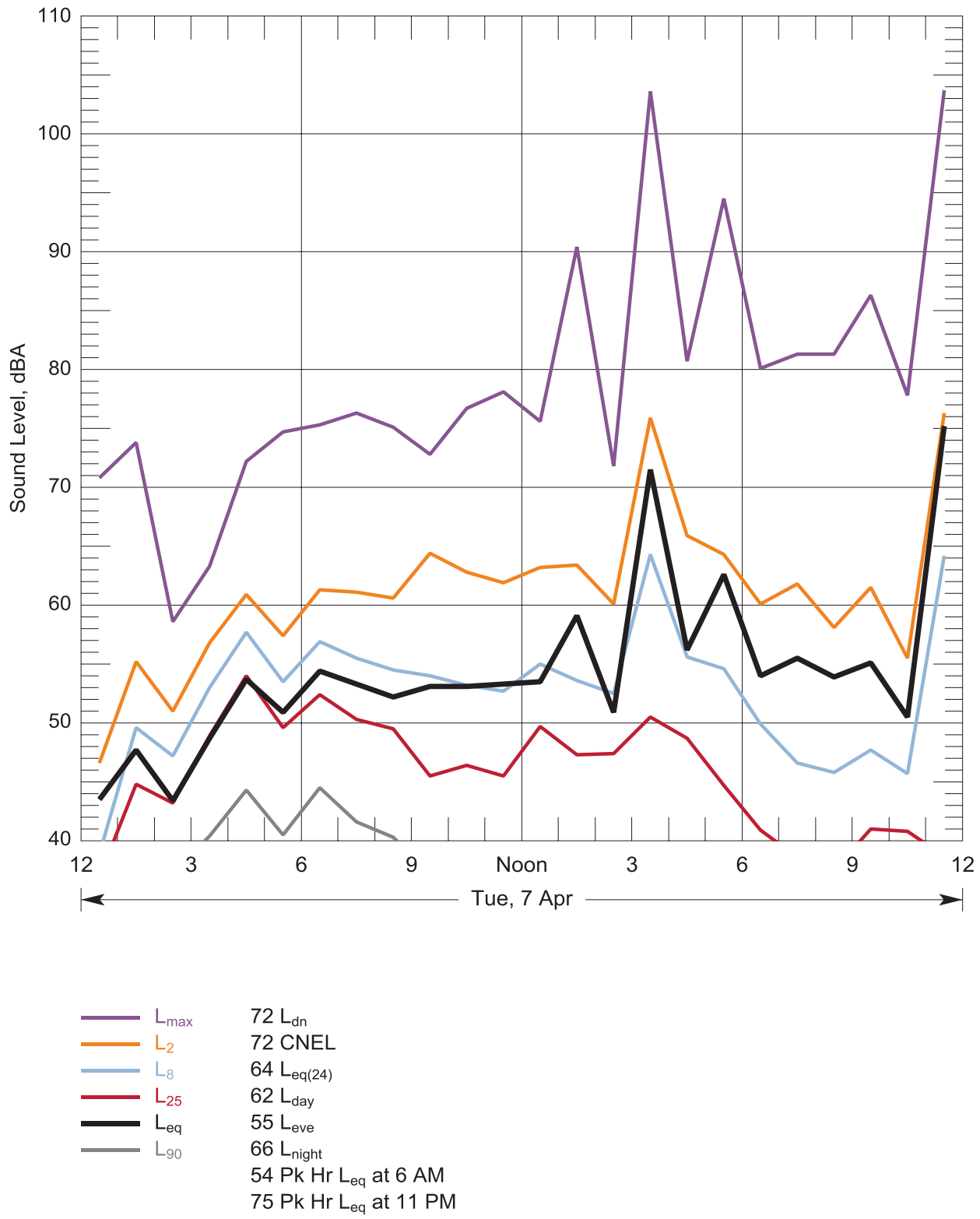

Figure 115: Hourly statistical summary of noise levels measured at Location 19 - 11846 170th Ave SW, Rochester on 07 Apr, 2015 and daily-average descriptors

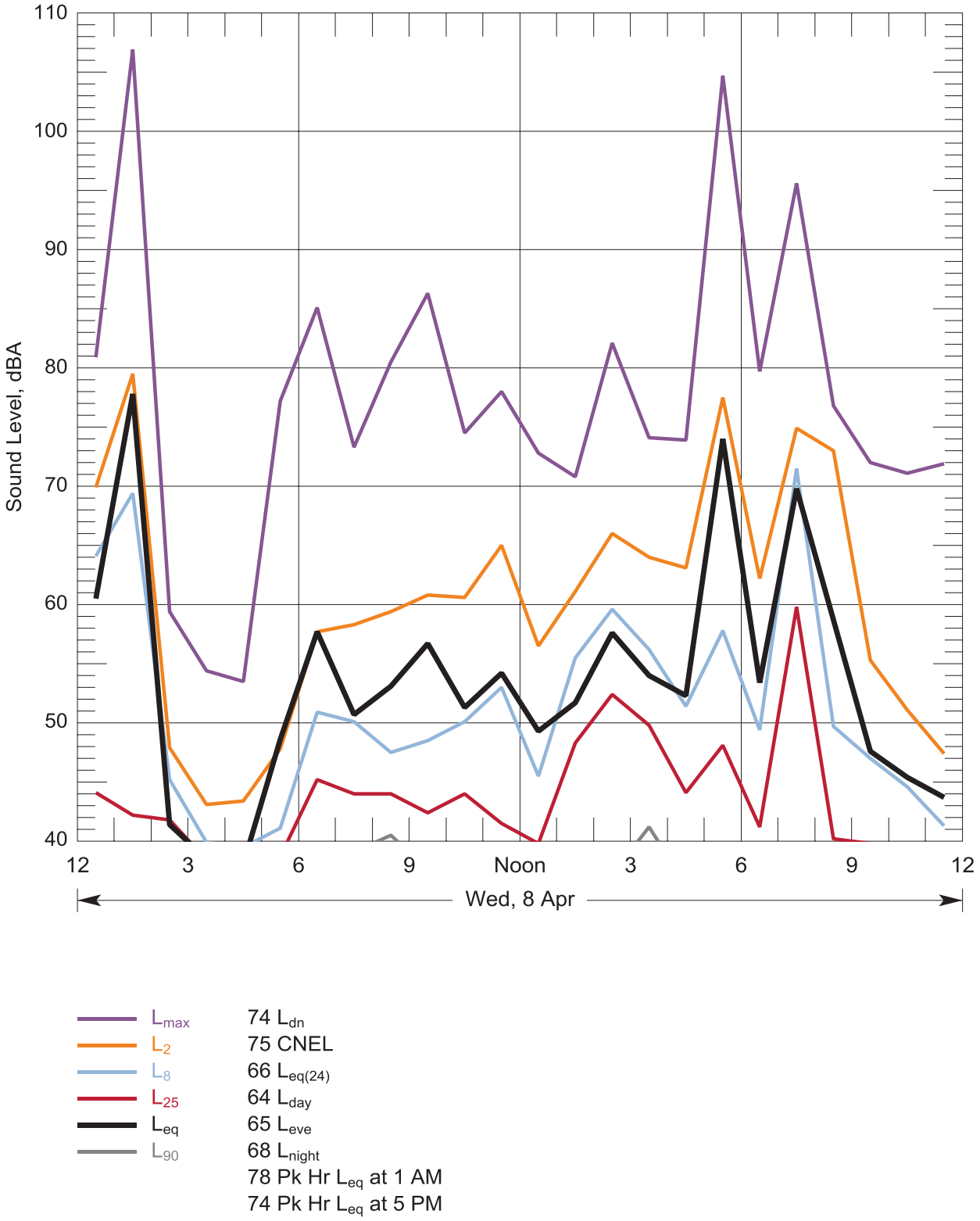

Figure 116: Hourly statistical summary of noise levels measured at Location 19 - 11846 170th Ave SW, Rochester on 08 Apr, 2015 and daily-average descriptors

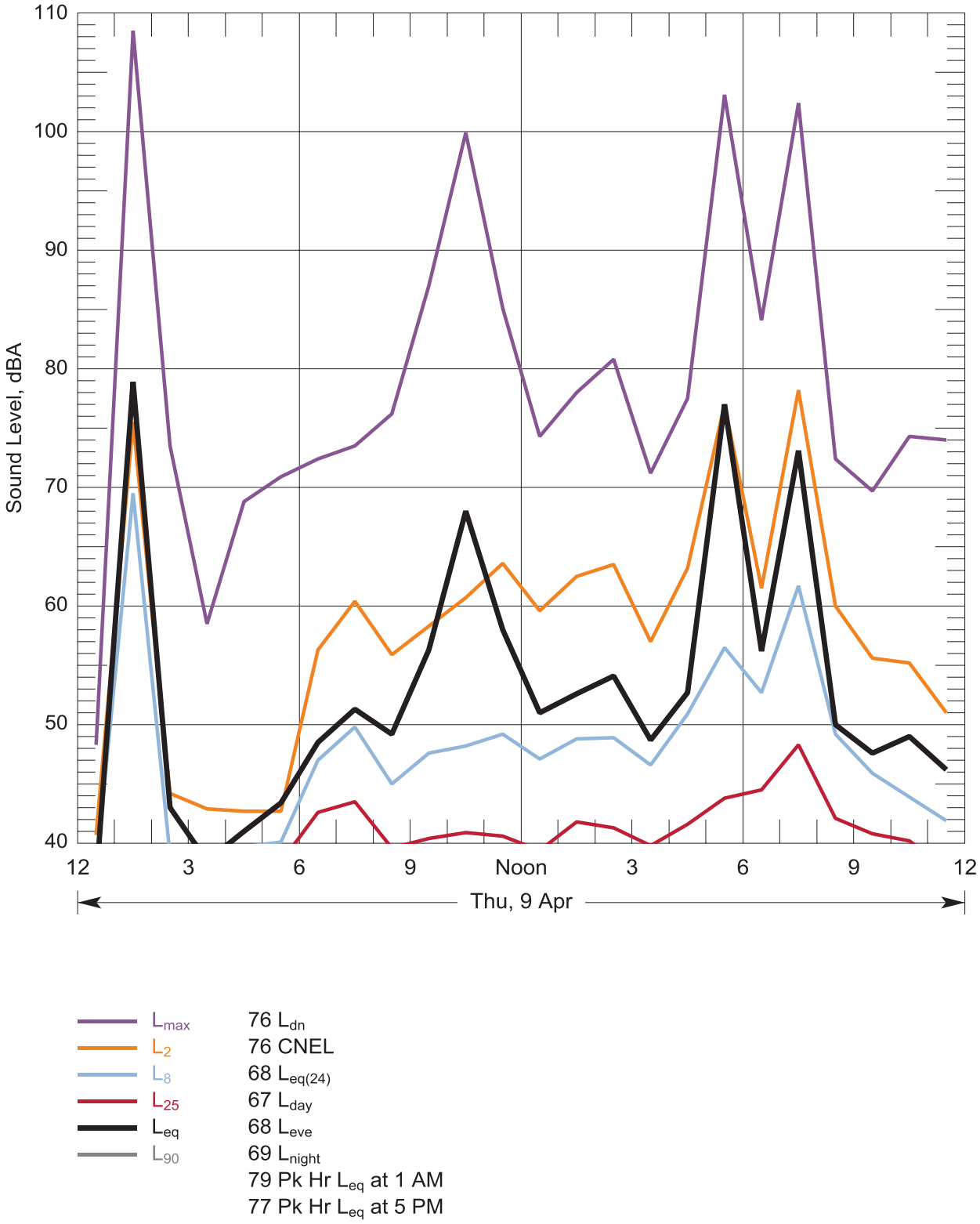

Figure 117: Hourly statistical summary of noise levels measured at Location 19 - 11846 170th Ave SW, Rochester on 09 Apr, 2015 and daily-average descriptors

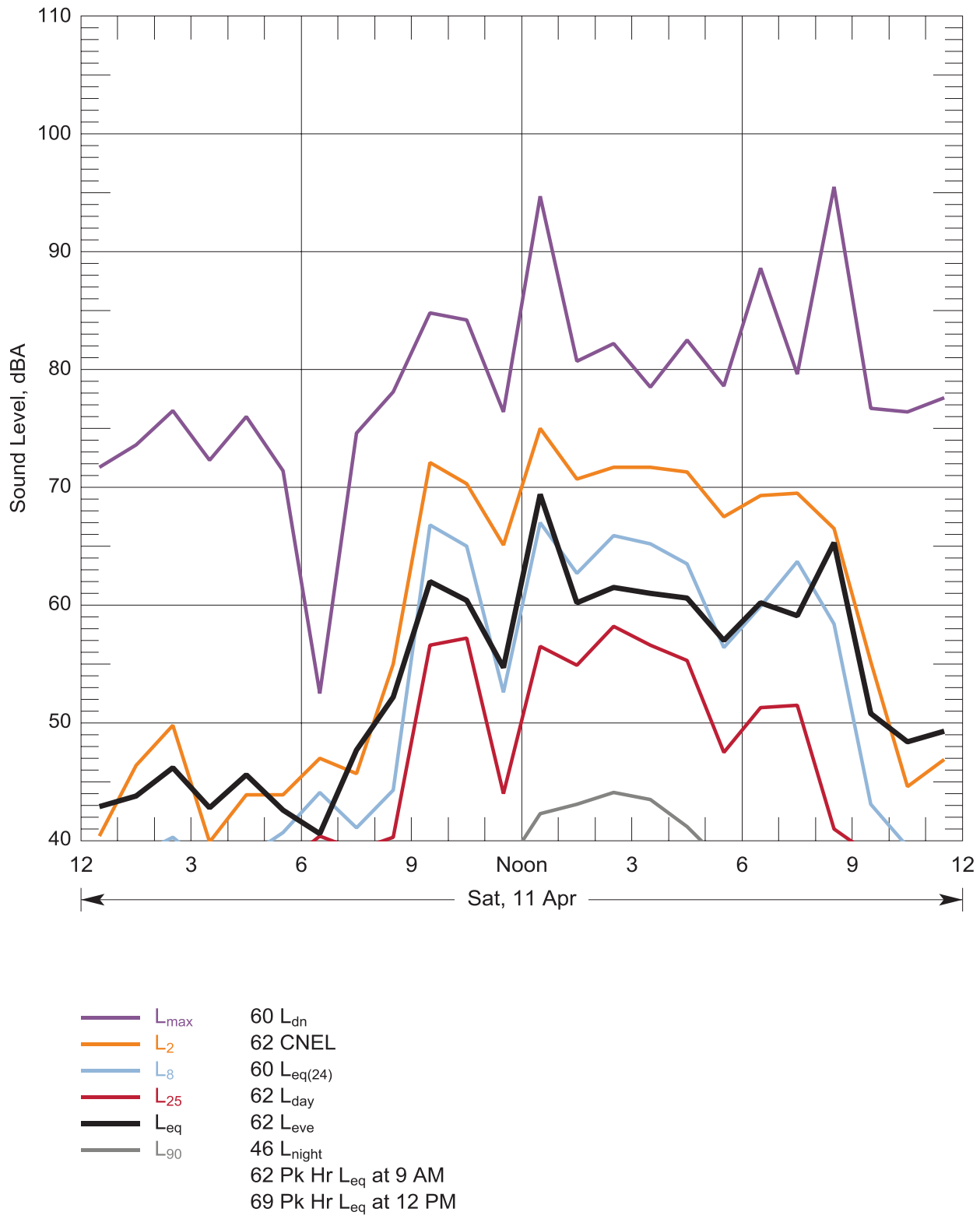

Figure 118: Hourly statistical summary of noise levels measured at Location 20 - 7220 Central Park Drive, Aberdeen on 11 Apr, 2015 and daily-average descriptors

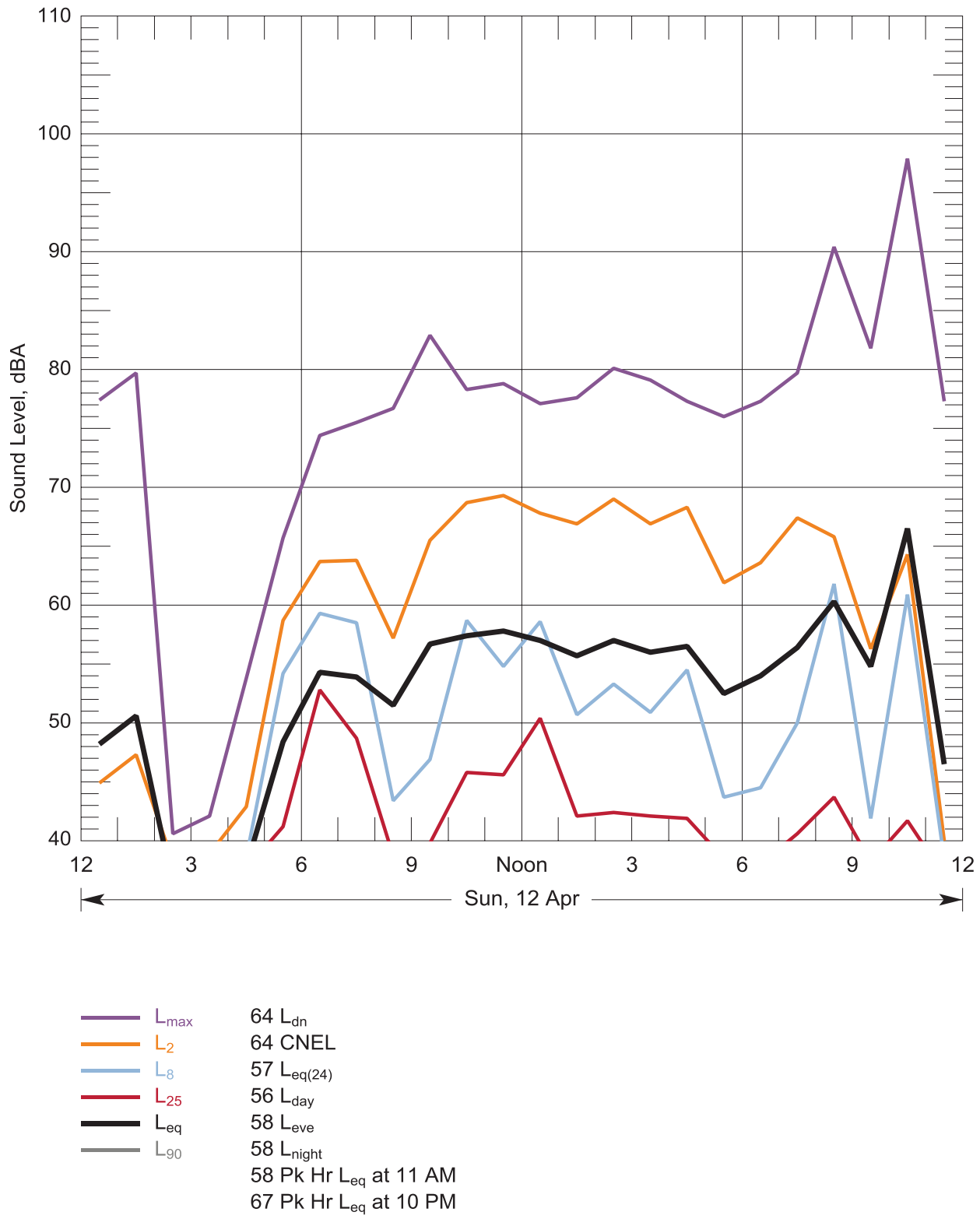

Figure 119: Hourly statistical summary of noise levels measured at Location 20 - 7220 Central Park Drive, Aberdeen on 12 Apr, 2015 and daily-average descriptors

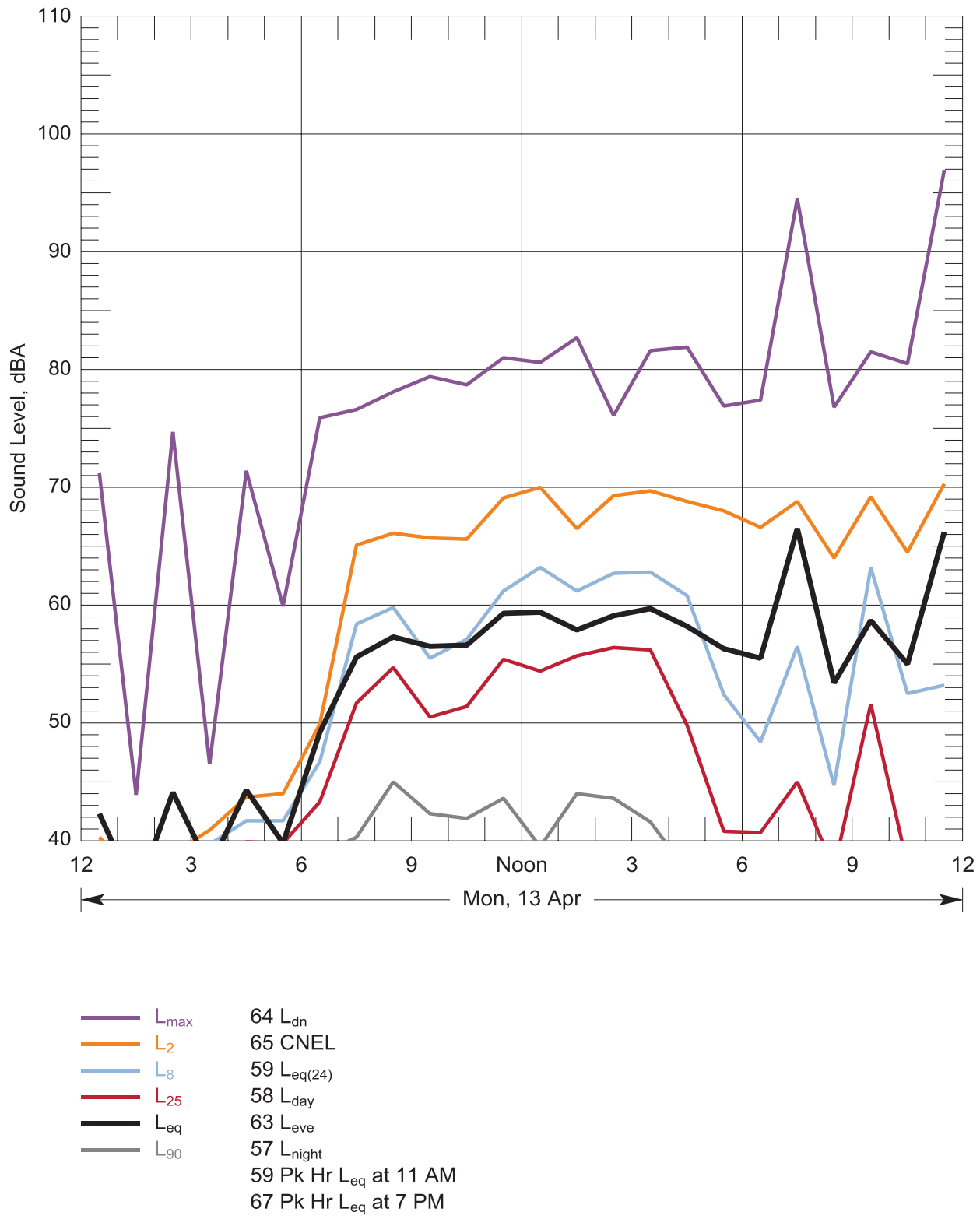

Figure 120: Hourly statistical summary of noise levels measured at Location 20 - 7220 Central Park Drive, Aberdeen on 13 Apr, 2015 and daily-average descriptors

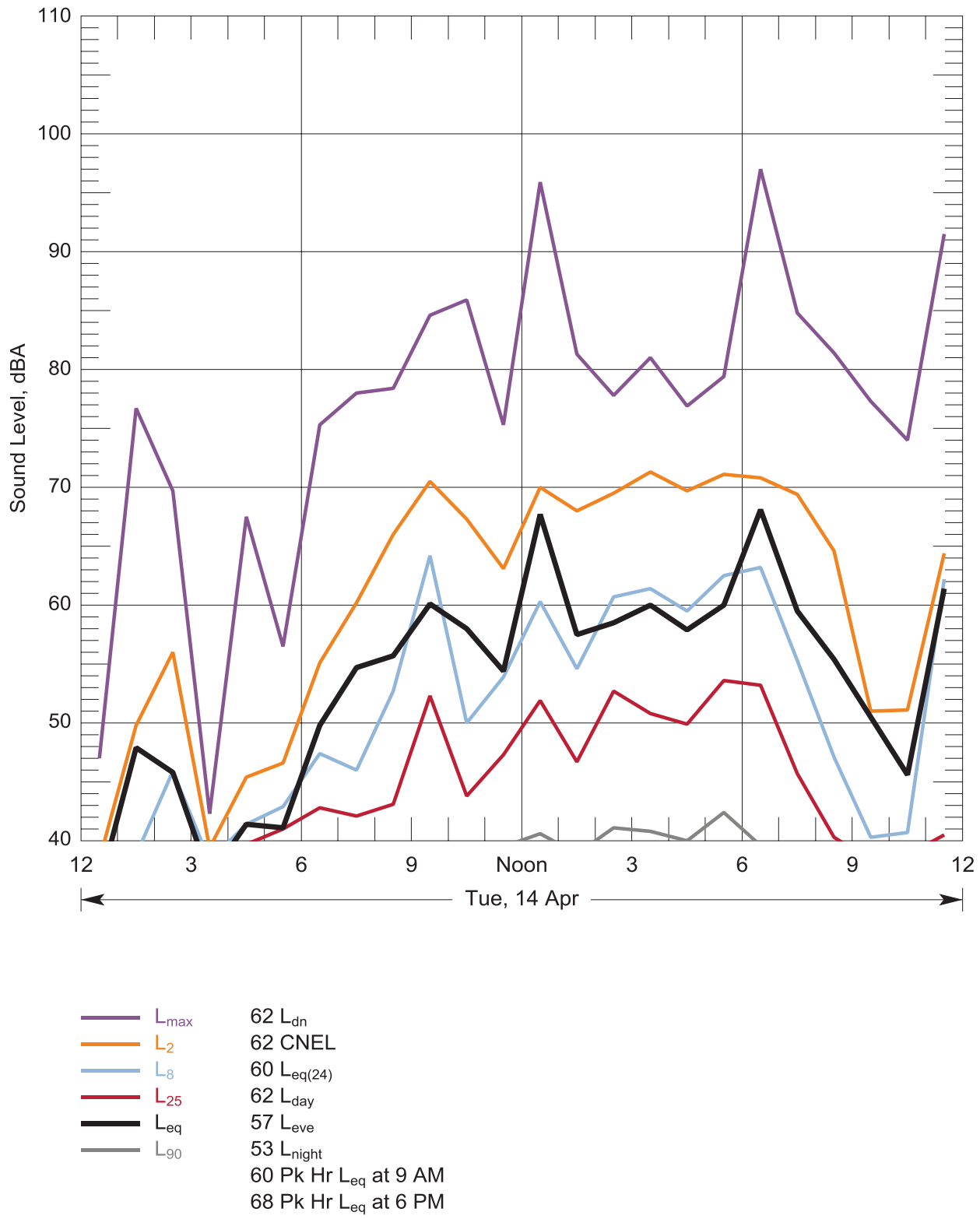

Figure 121: Hourly statistical summary of noise levels measured at Location 20 - 7220 Central Park Drive, Aberdeen on 14 Apr, 2015 and daily-average descriptors

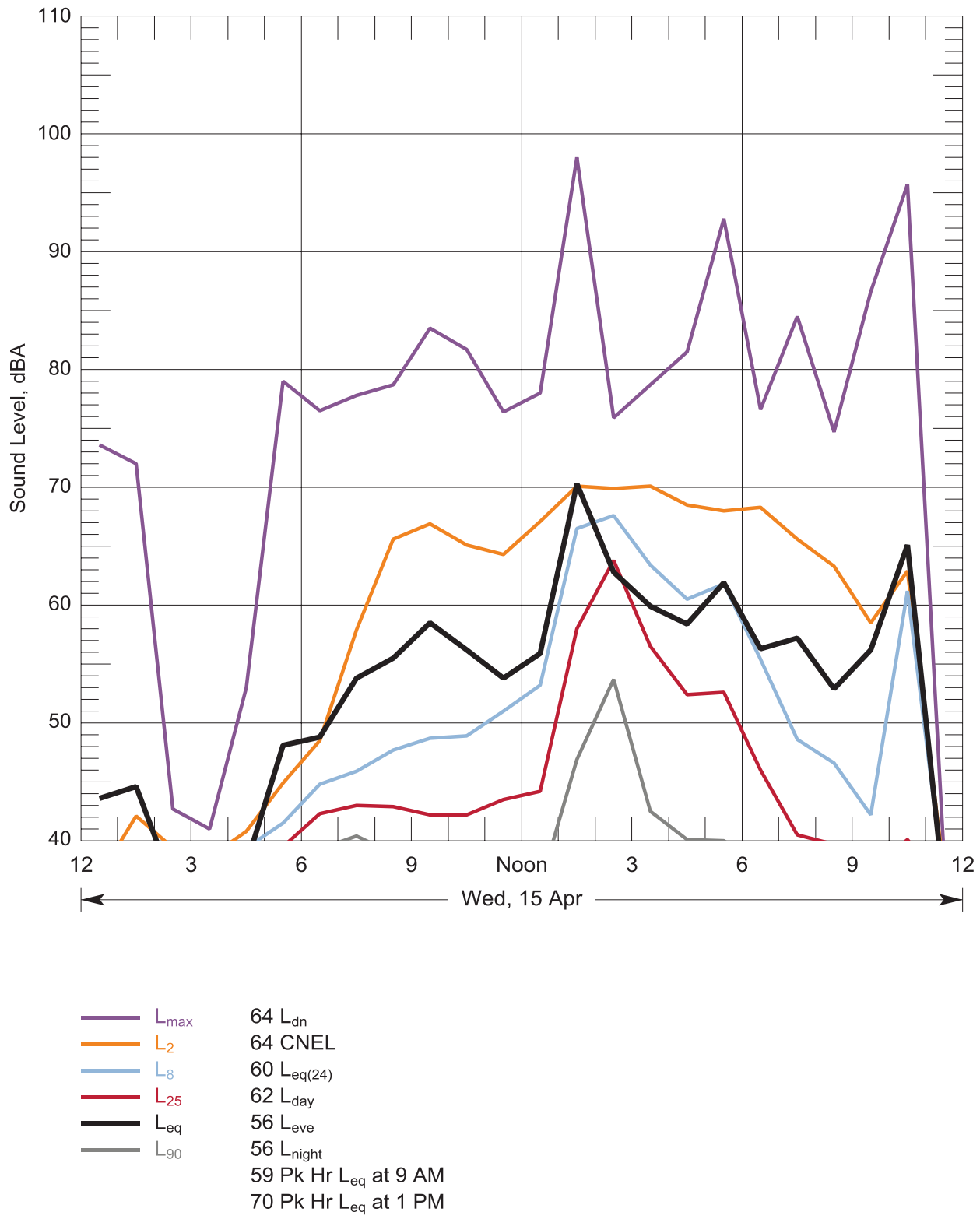

Figure 122: Hourly statistical summary of noise levels measured at Location 20 - 7220 Central Park Drive, Aberdeen on 15 Apr, 2015 and daily-average descriptors

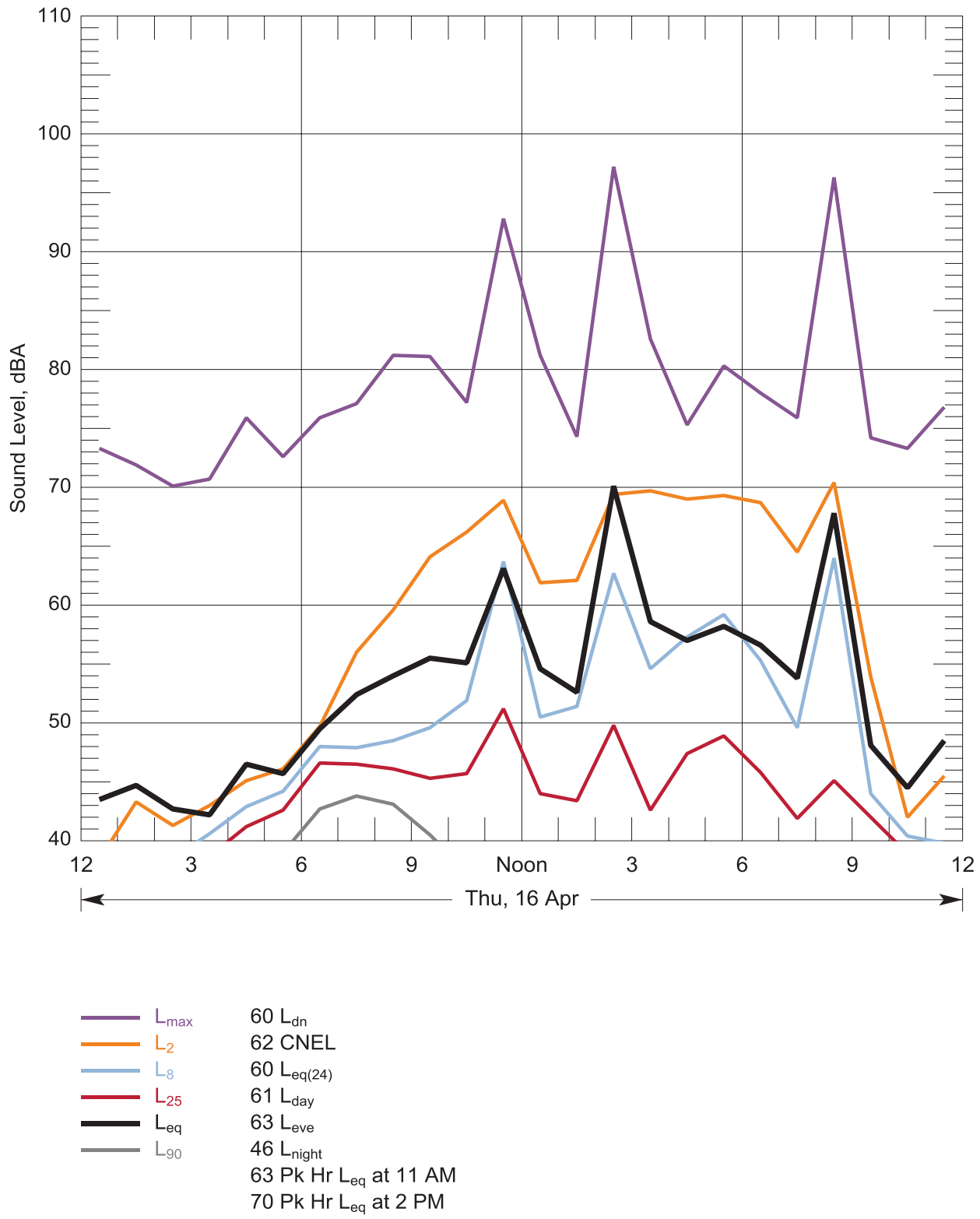

Figure 123: Hourly statistical summary of noise levels measured at Location 20 - 7220 Central Park Drive, Aberdeen on 16 Apr, 2015 and daily-average descriptors

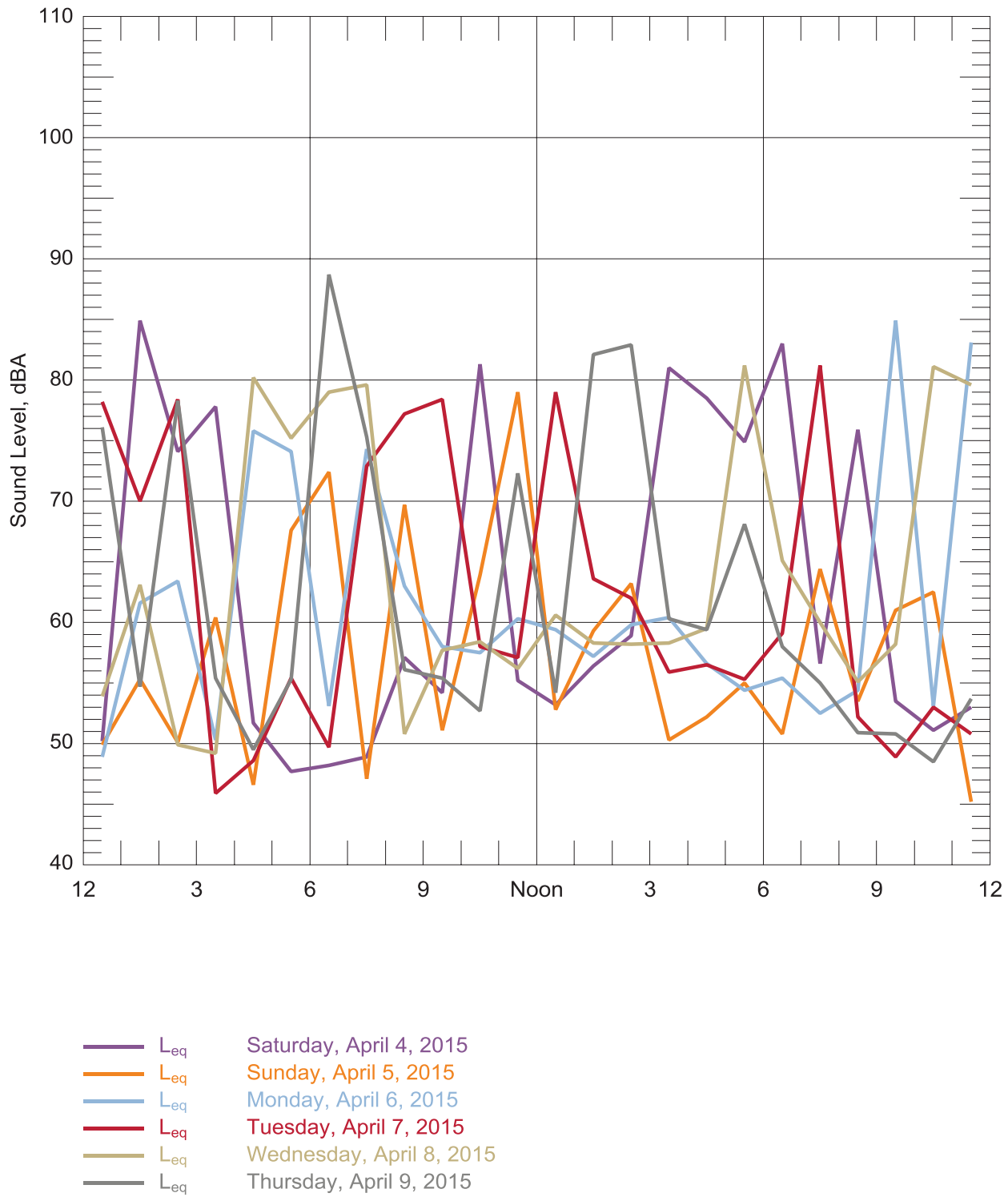

Figure 124: Hourly statistical summary of noise levels at Location 1 - 1023 B St, Centralia

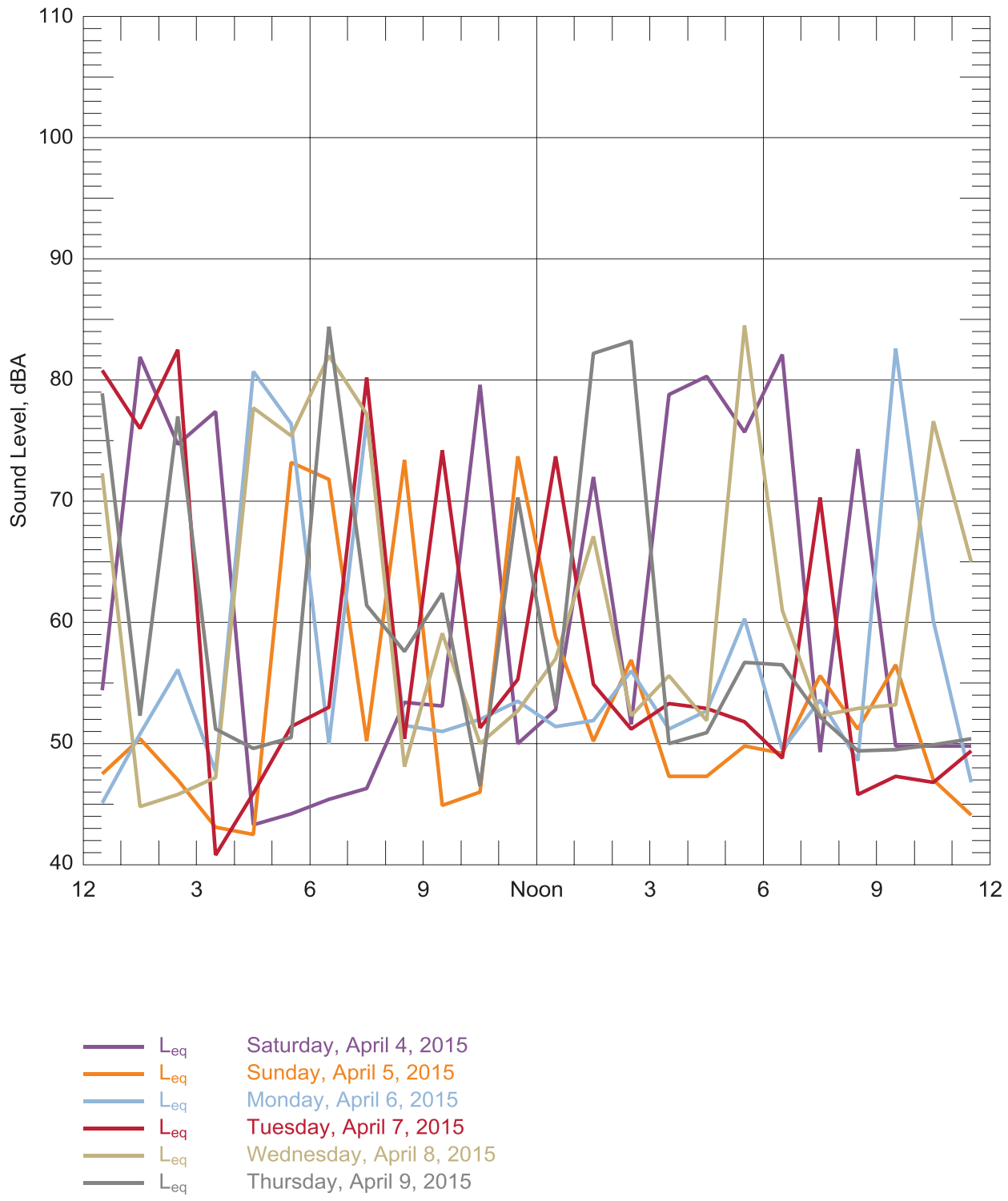

Figure 125: Hourly statistical summary of noise levels at Location 2 - 1102 G St, Centralia

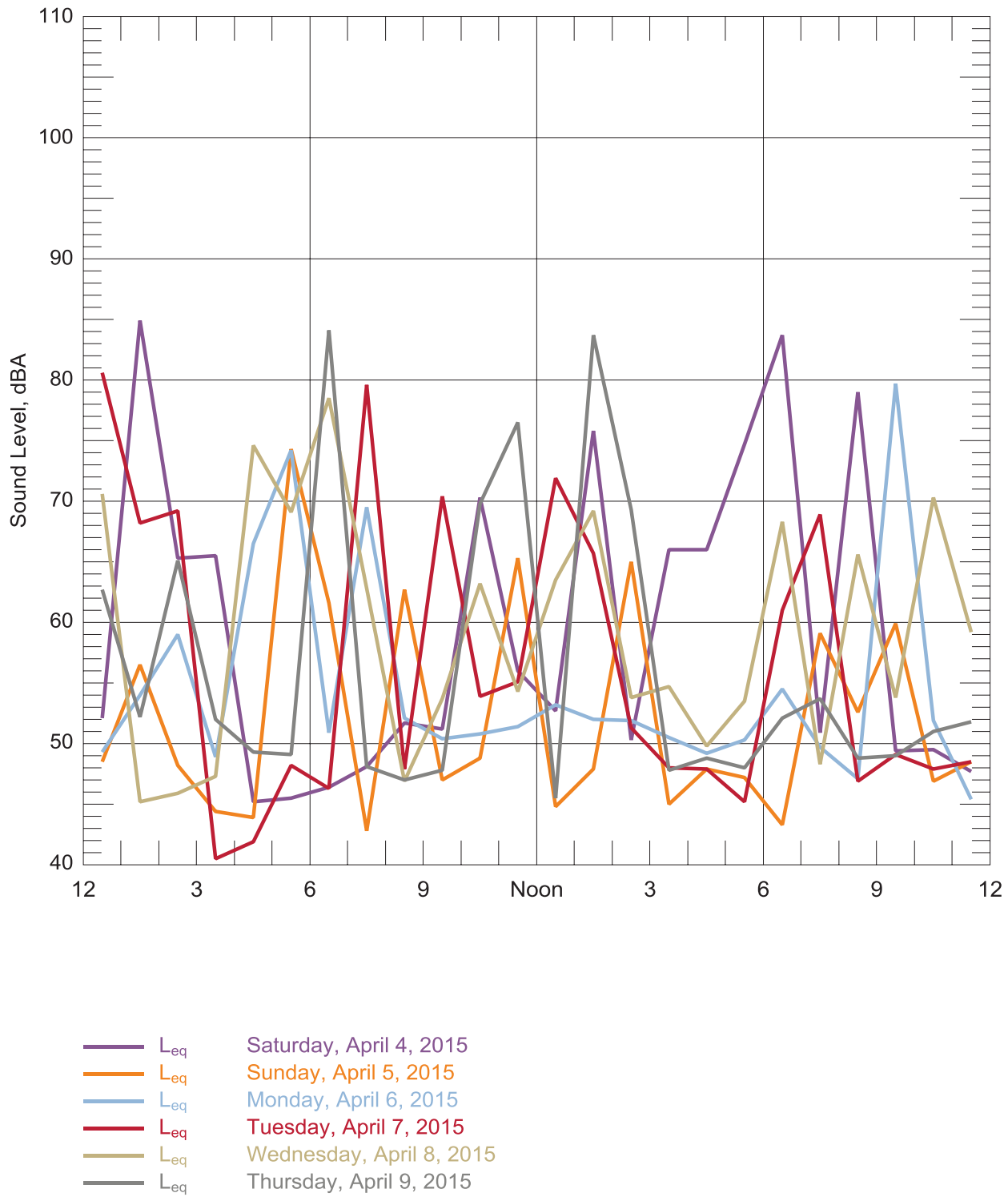

Figure 126: Hourly statistical summary of noise levels at Location 3 - 1103 J St, Centralia

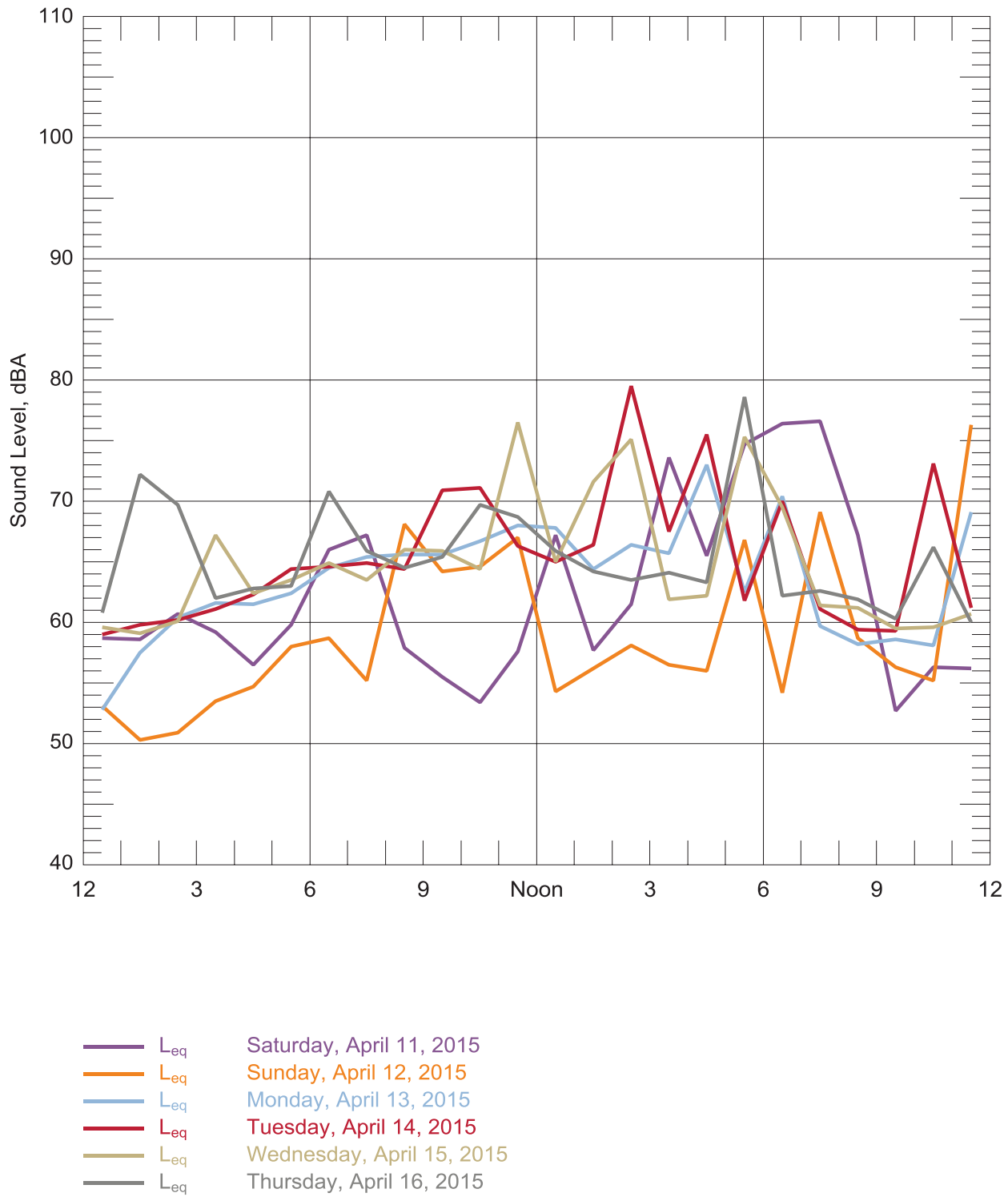

Figure 127: Hourly statistical summary of noise levels at Location 4B - 3900 Kuper Rd, Centralia

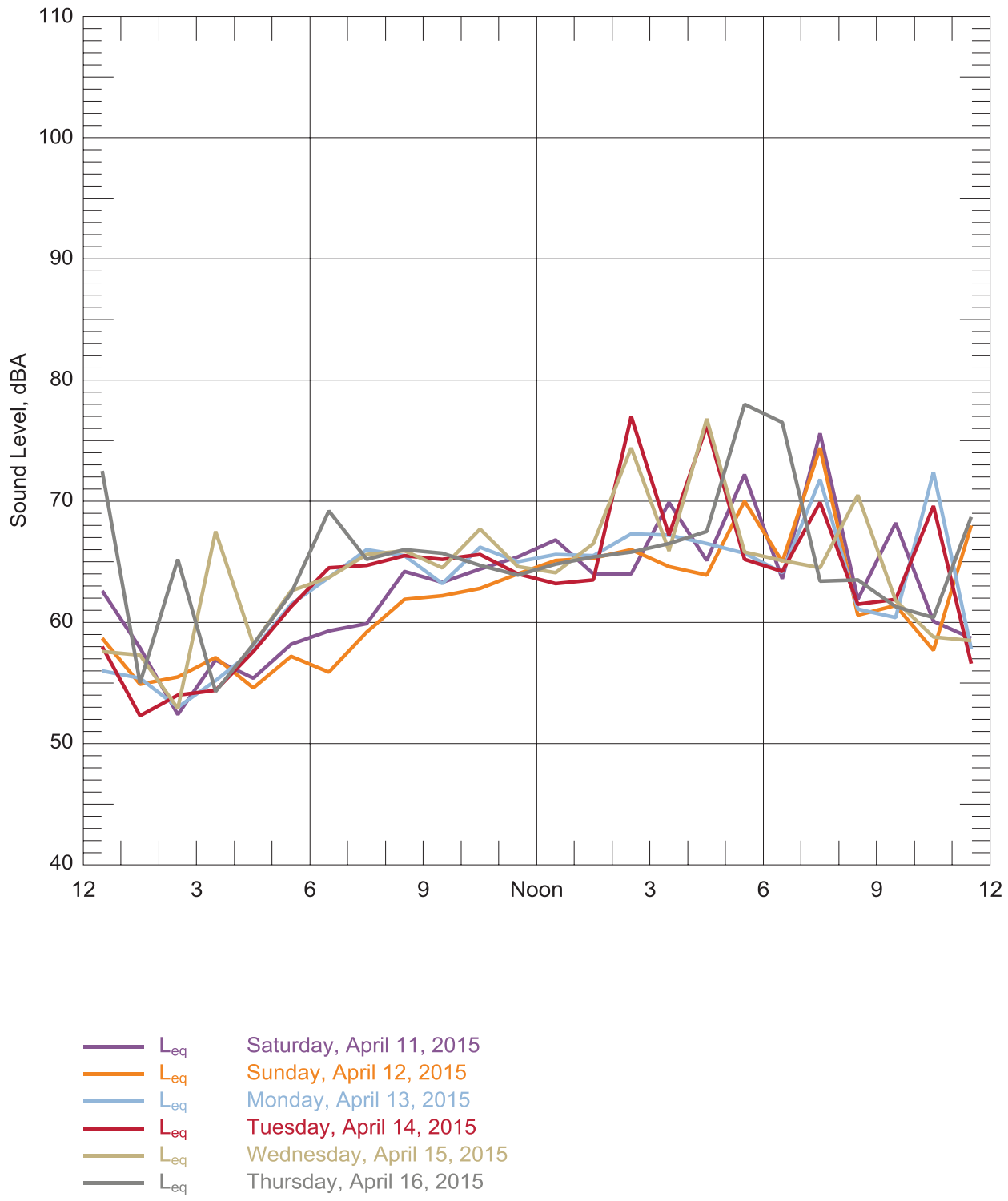

Figure 128: Hourly statistical summary of noise levels at Location 5 Alt – Old Hwy 9 & Tea St. SW, Rochester

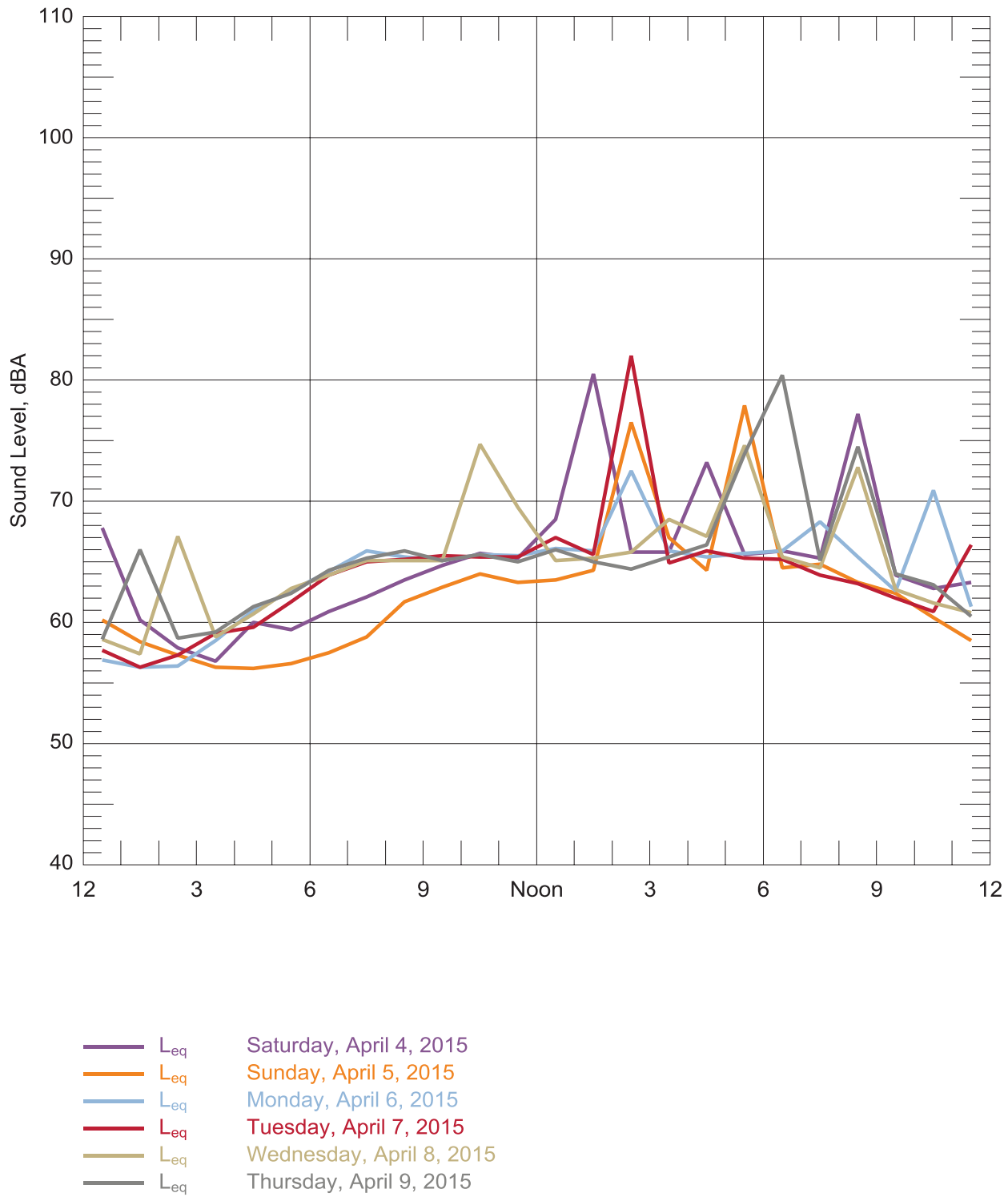

Figure 129: Hourly statistical summary of noise levels at Location 6 - 19318 Grand Mound Way, Rochester

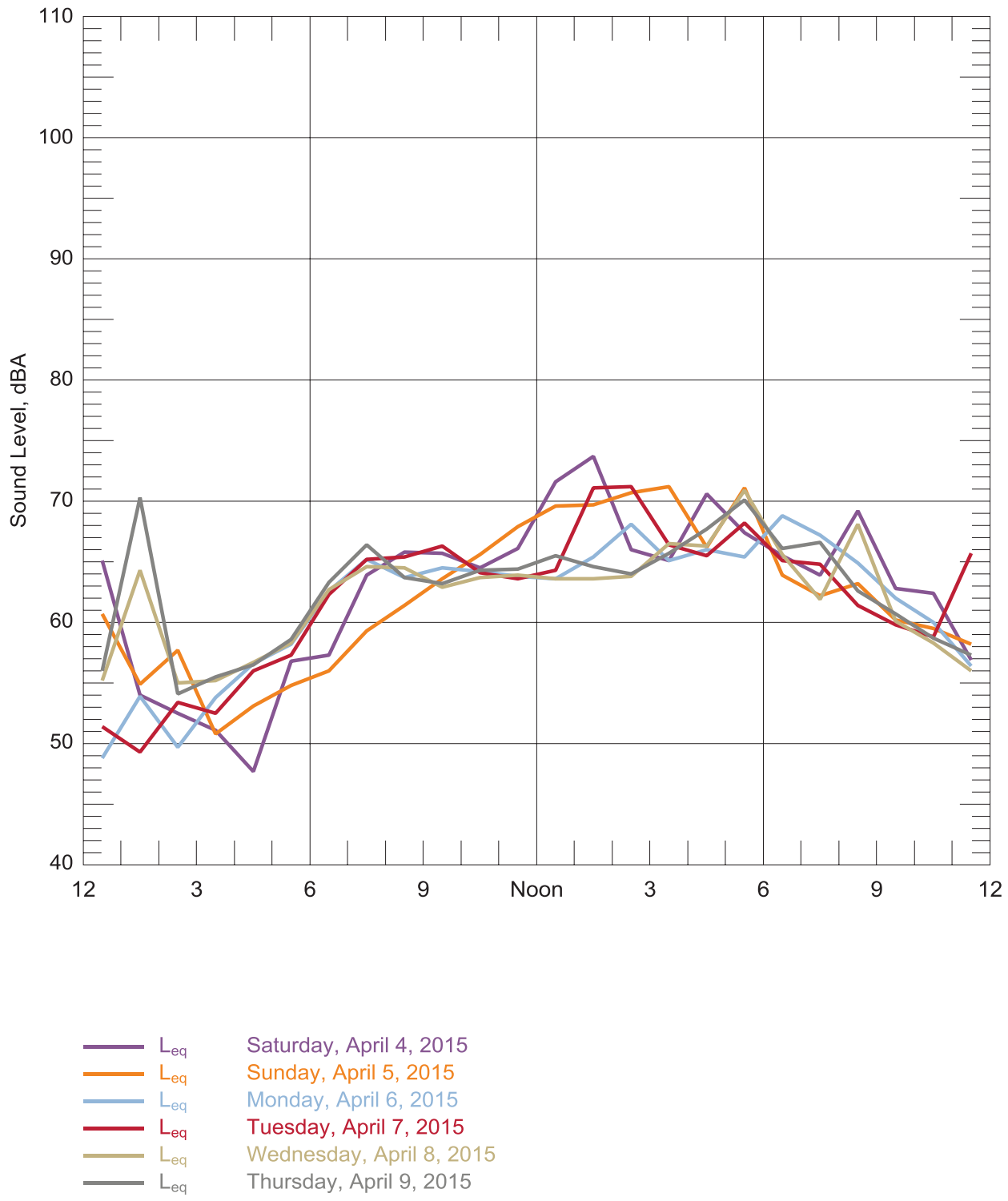

Figure 130: Hourly statistical summary of noise levels Location 8 - 180th & Little Rock, Rochester

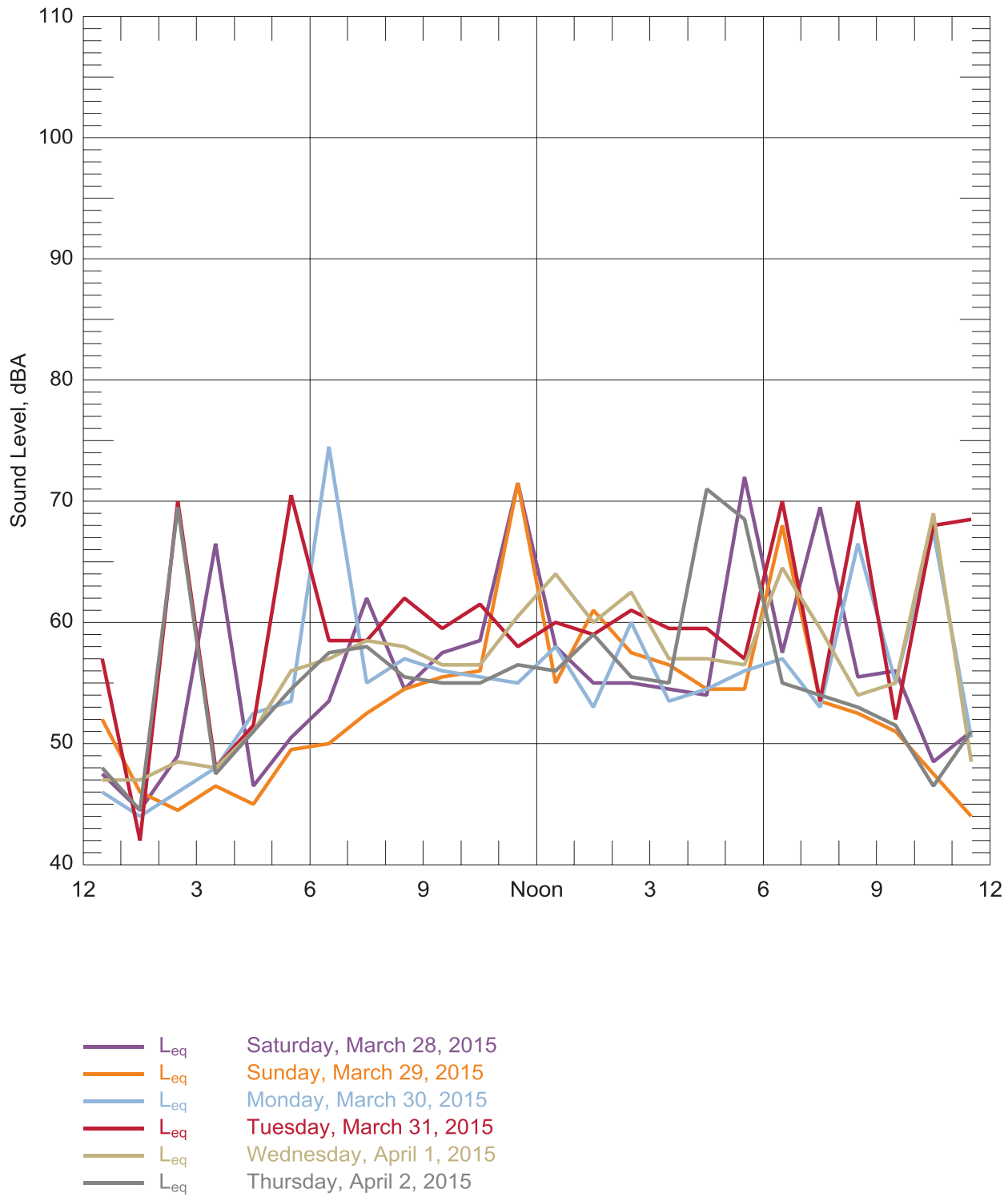

Figure 131: Hourly statistical summary of noise levels at Location 9 - 205 Murrey, Oakville

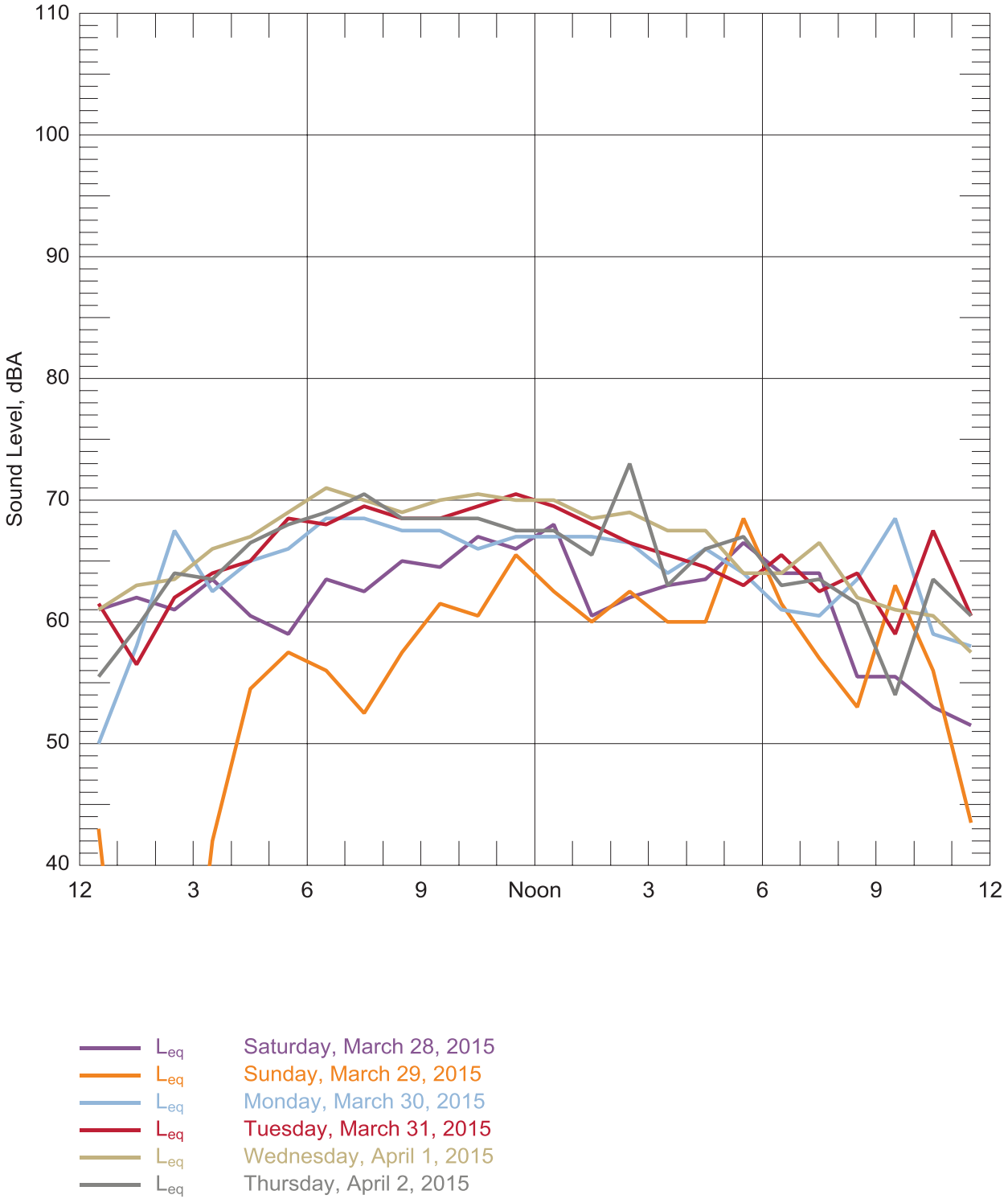

Figure 132: Hourly statistical summary of noise levels at Location 10 - 22 Evergreen Village Lane, Elma

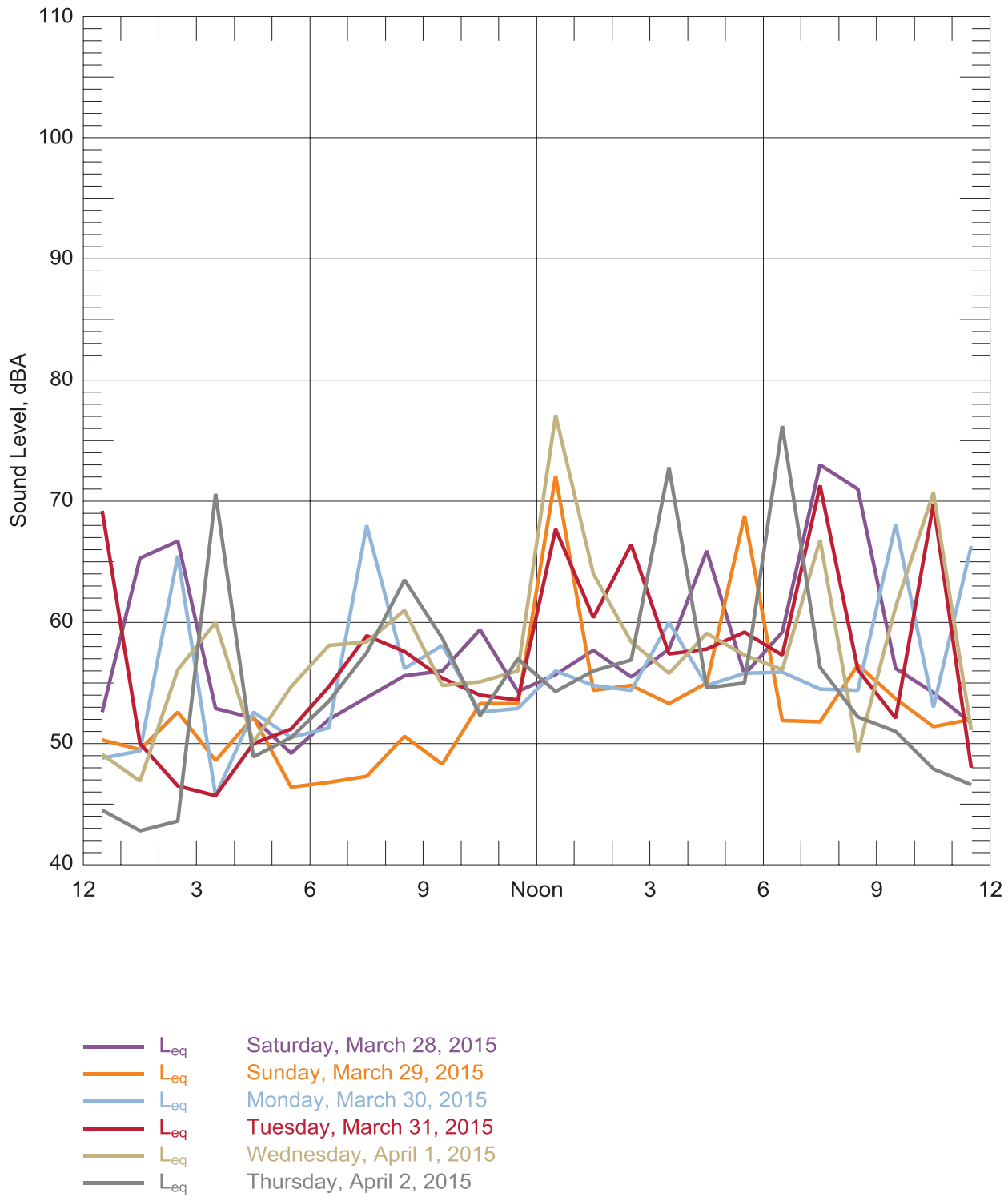

Figure 133: Hourly statistical summary of noise levels at Location 11 - 513 N 13th St, Elma

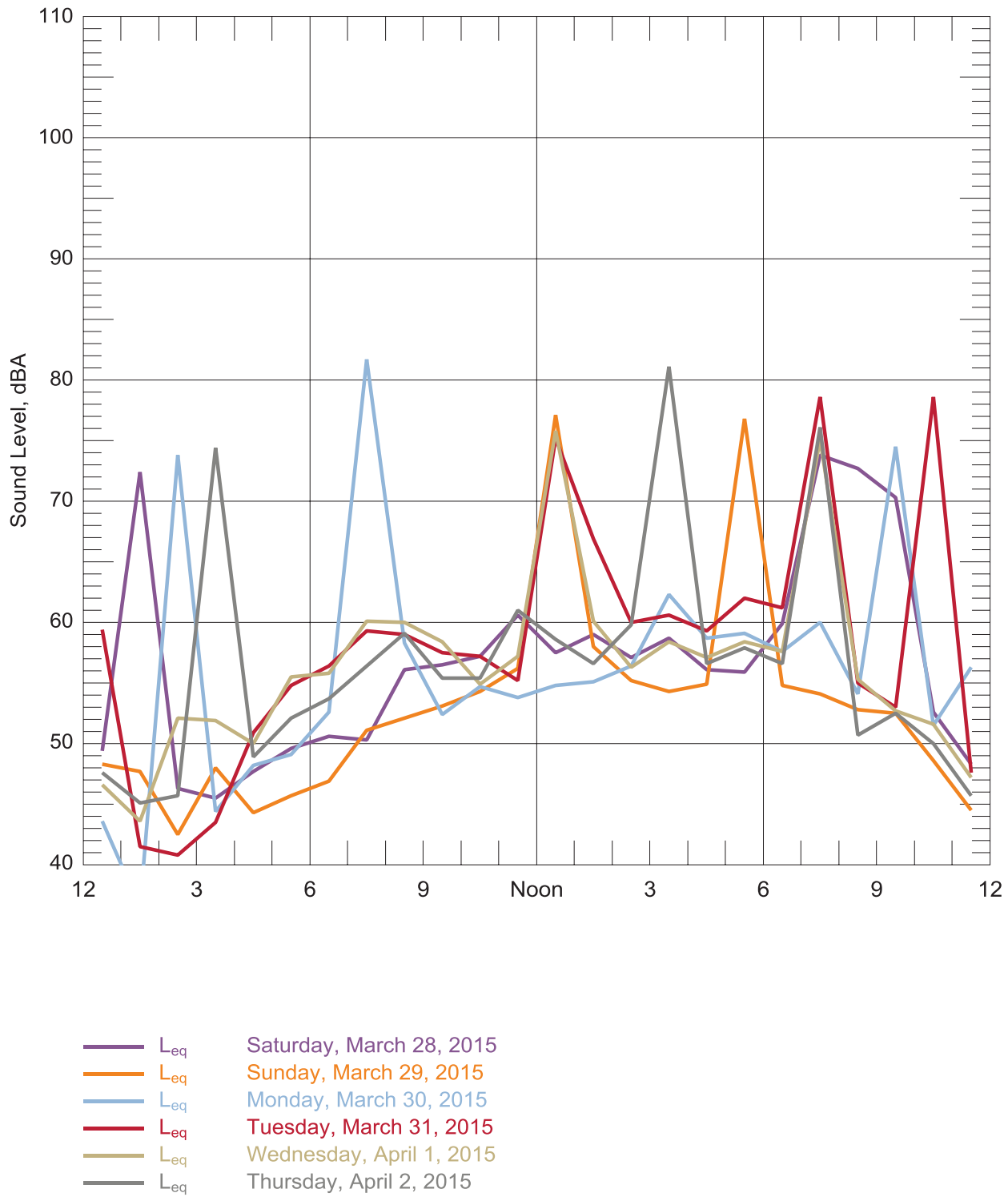

Figure 134: Hourly statistical summary of noise levels at Location 12 - 502 N 13th St, Elma

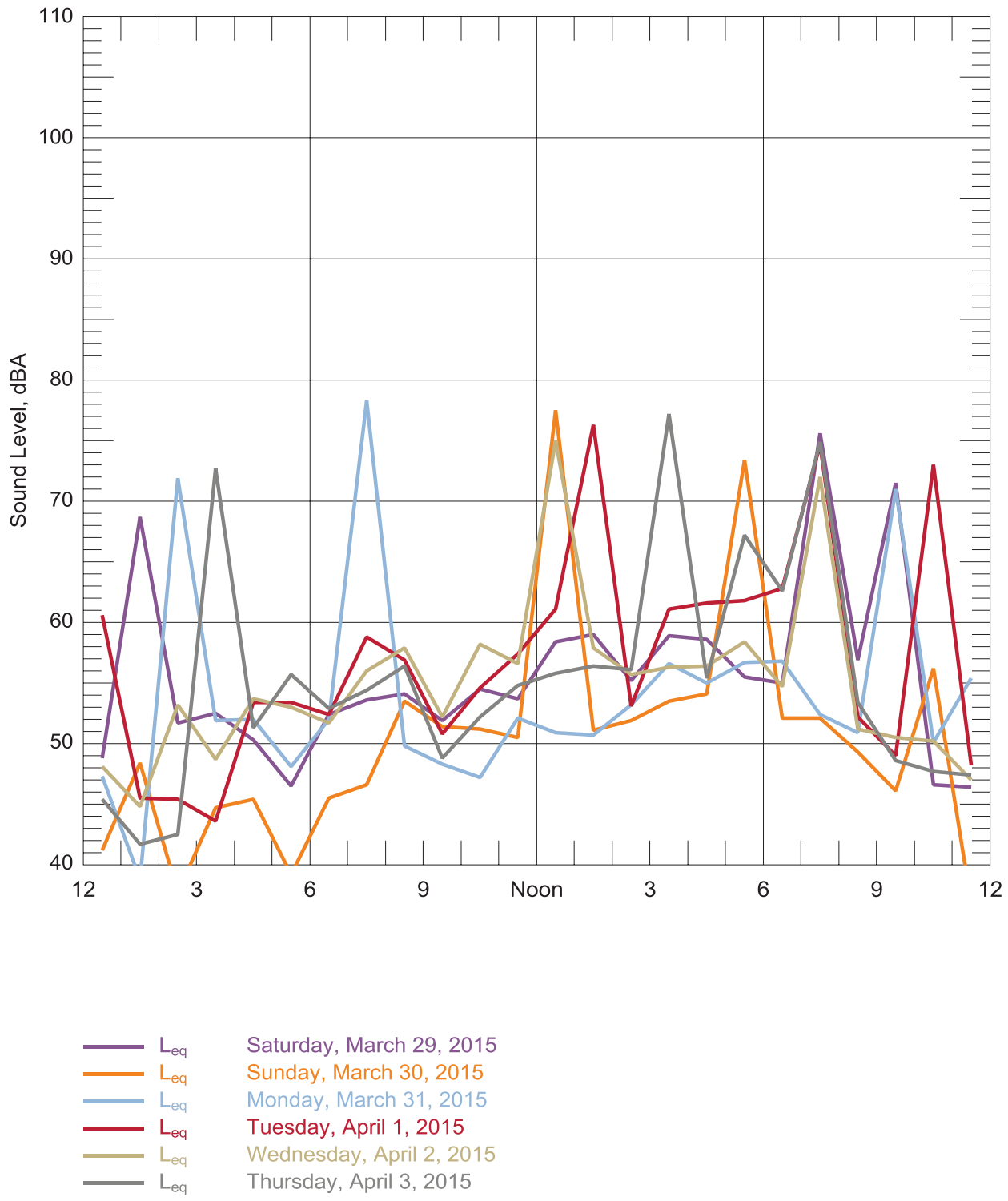

Figure 135: Hourly statistical summary of noise levels at Location 13 - 57 Hurd Rd, Elma

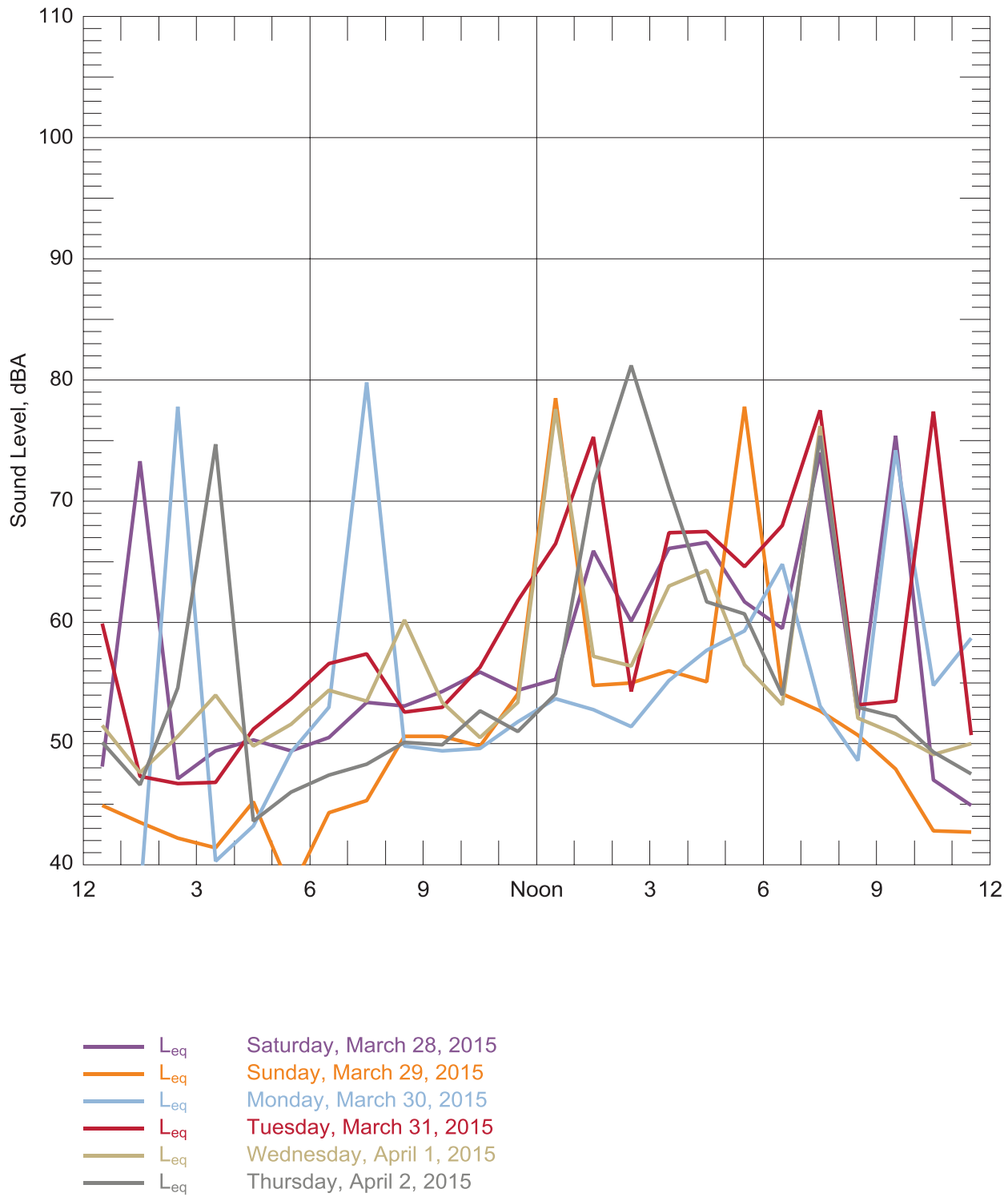

Figure 136: Hourly statistical summary of noise levels at Location 14 - 510 Foss Ave, Satsop

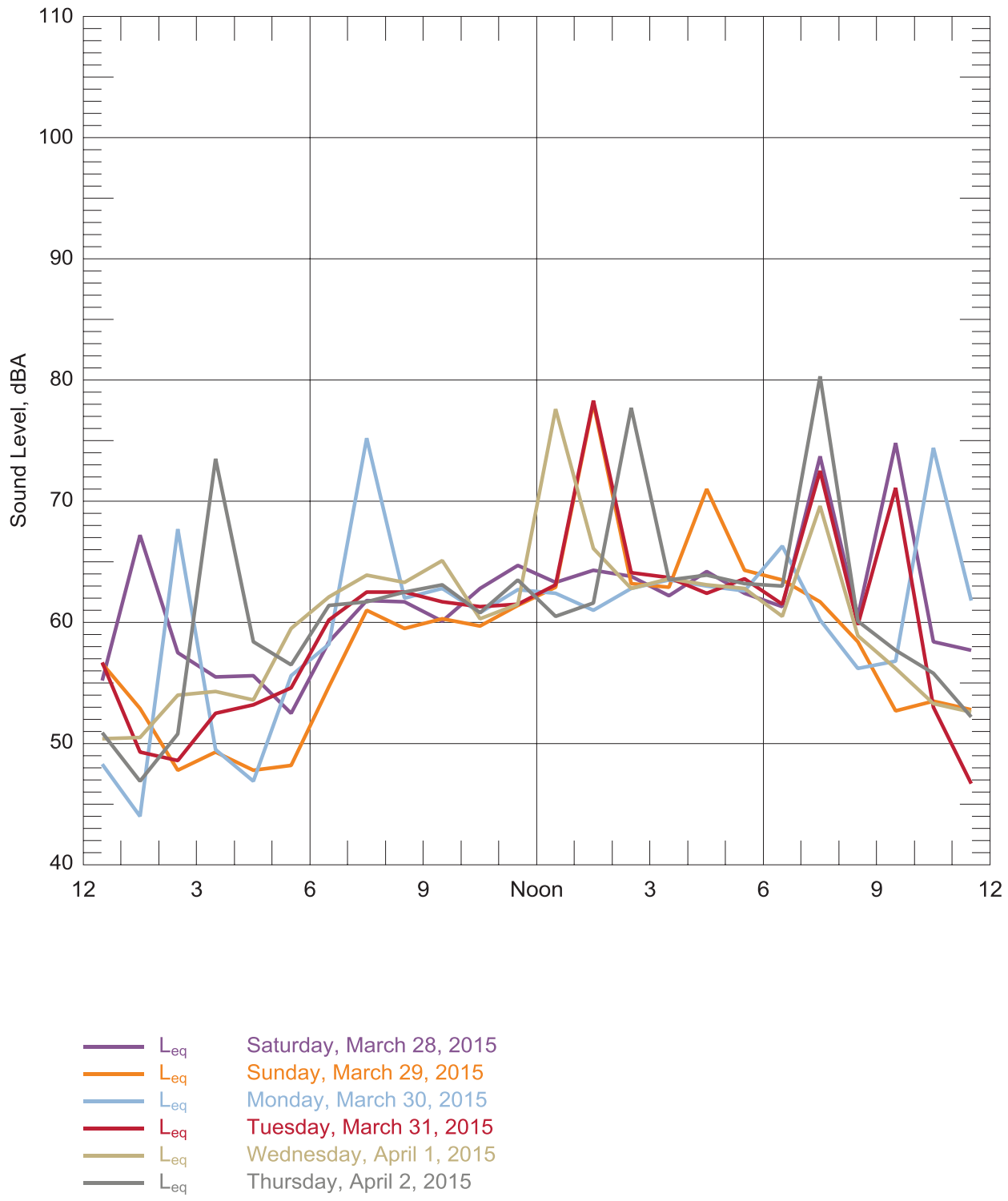

Figure 137: Hourly statistical summary of noise levels at Location 15 - 78 Devonshire, Montesano

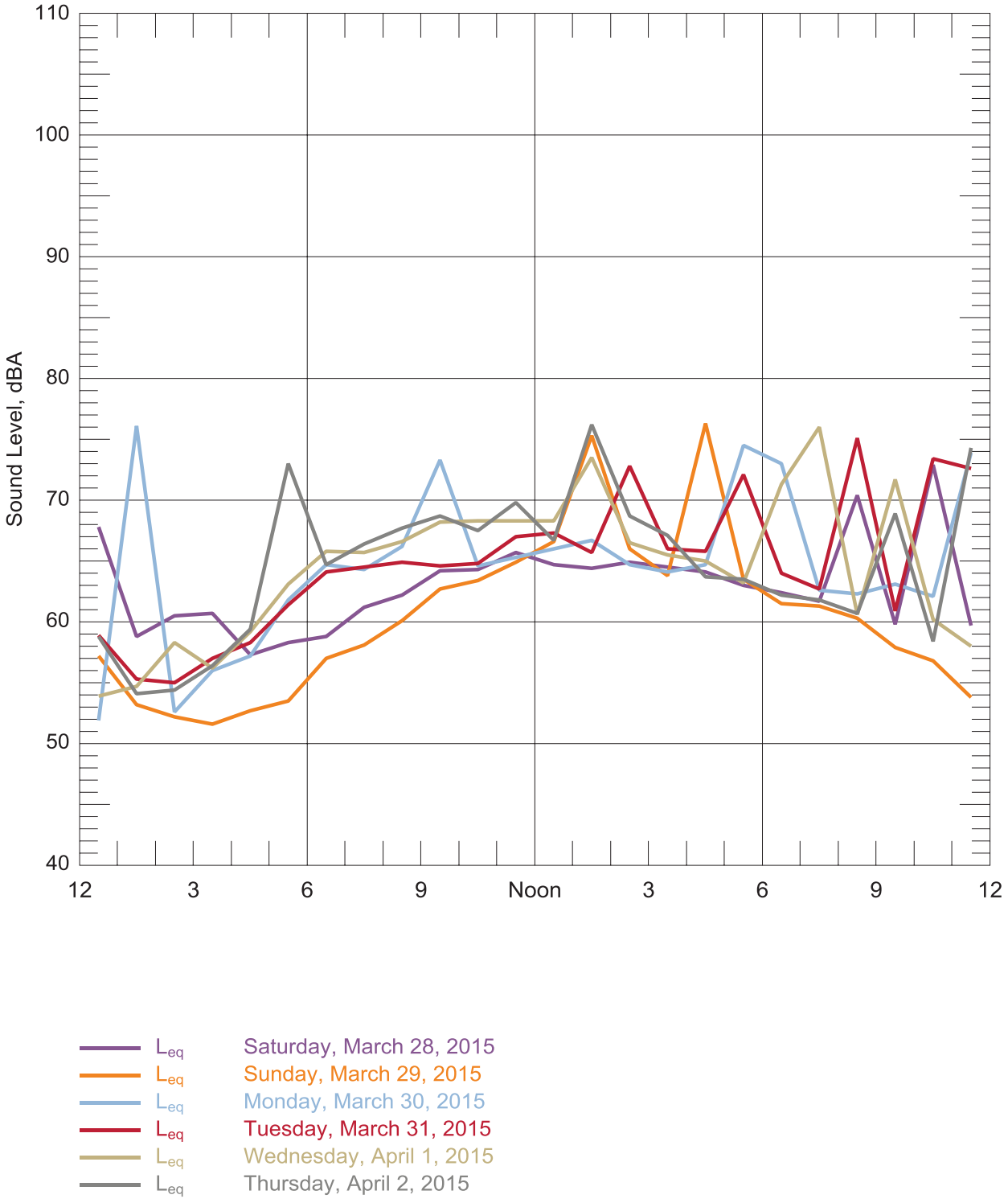

Figure 138: Hourly statistical summary of noise levels at Location 16 - 140 S Chehalis St, Aberdeen

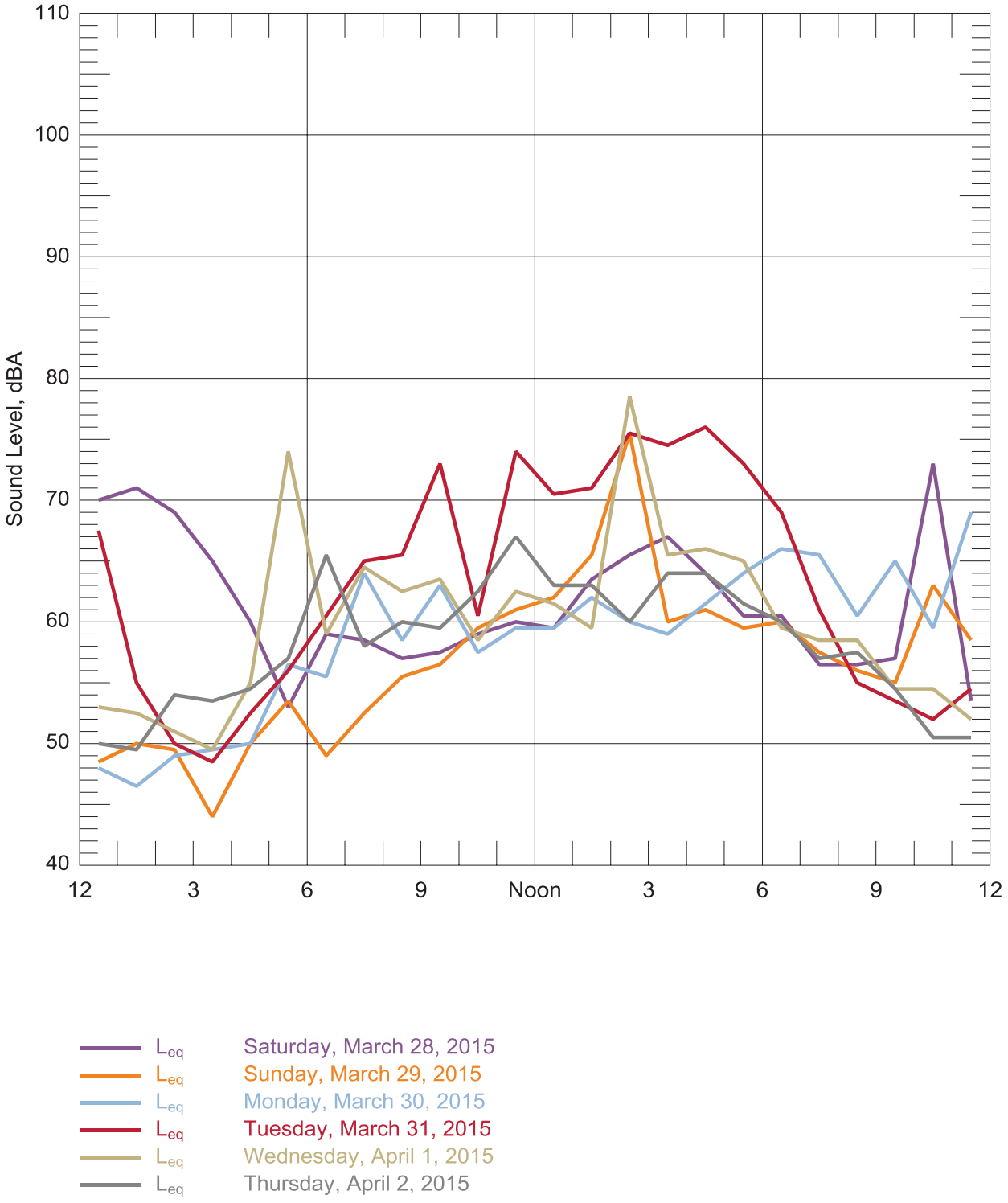

Figure 139: Hourly statistical summary of noise levels at Location 18 - 2100 1st Street, Aberdeen

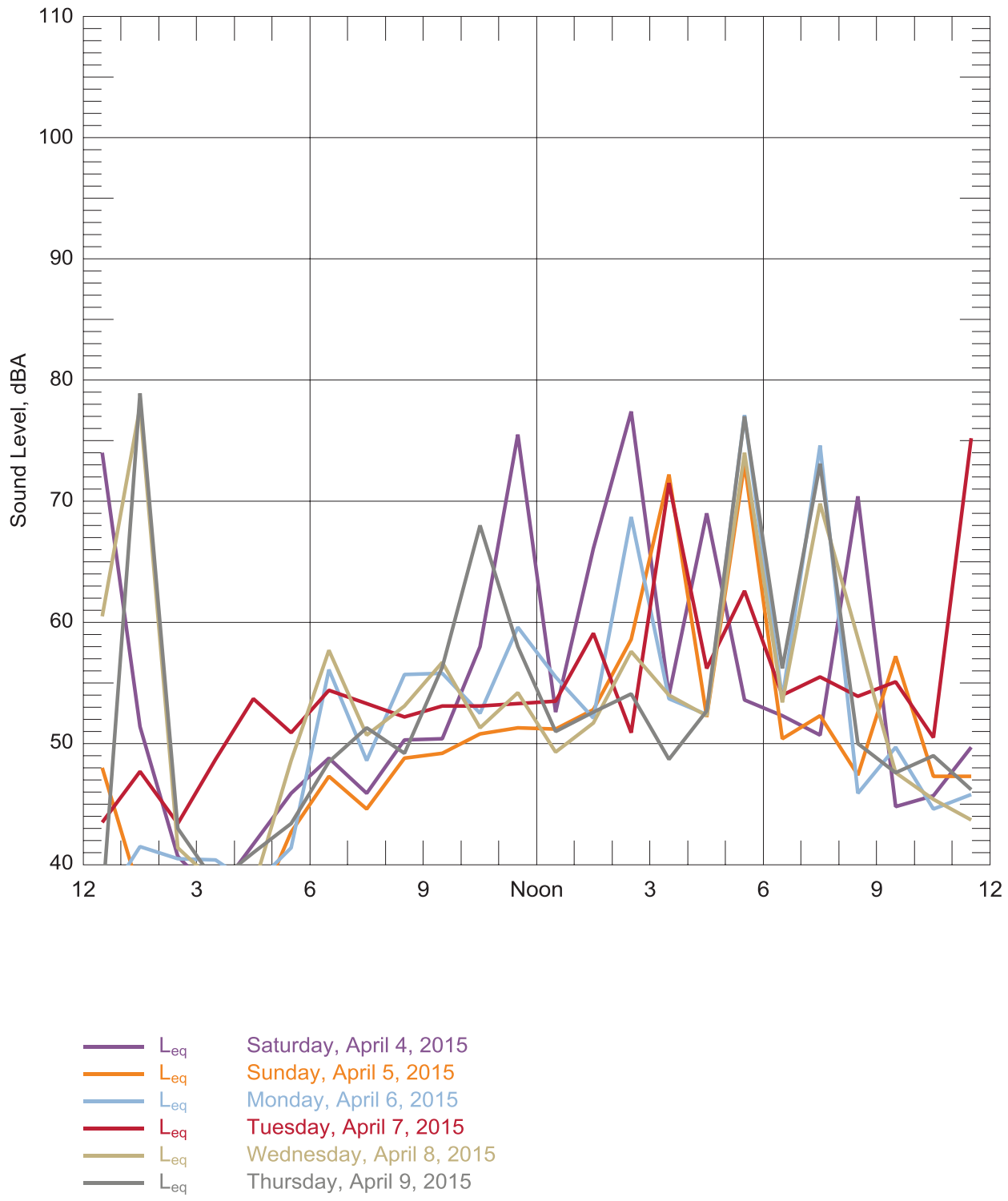

Figure 140: Hourly statistical summary of noise levels at Location 19 - 11846 170th Ave SW, Rochester

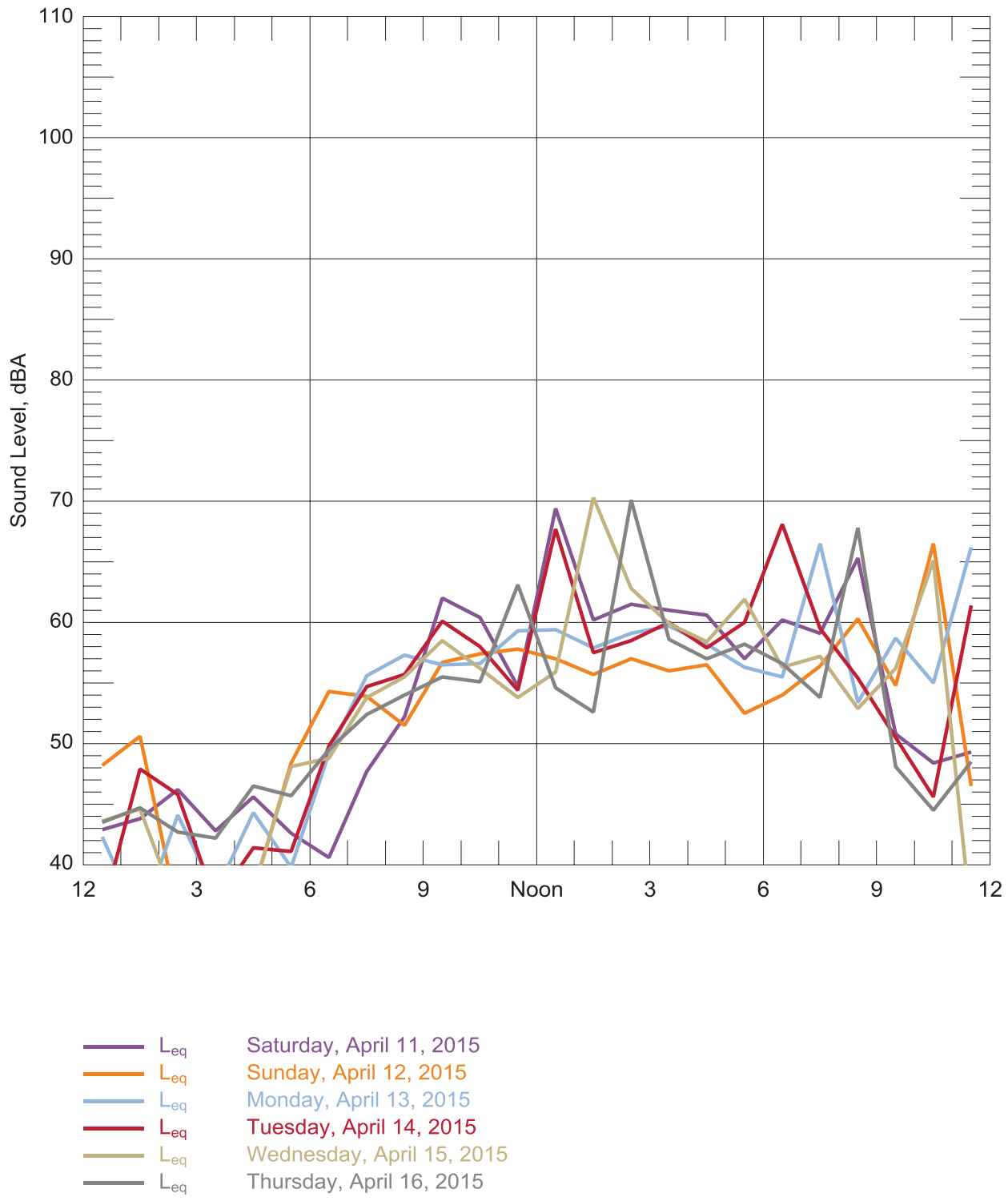

Figure 141: Hourly statistical summary of noise levels at Location 20 - 7220 Central Park Drive, Aberdeen

WILSON IHRIG
ACOUSTICS, NOISE & VIBRATION
CALIFORNIA
WASHINGTON
NEW YORK

MEMORANDUM

DATE: 6 May 2015

TO: Jason Volk, Kim Marcotte, ICF International

FROM: Thom Bergen

SUBJECT: Supplemental short-term noise data – PSAP rail corridor
Westway-Imperium Expansion Project – Hoquiam, WA

This memorandum presents noise data collected during three site visits to the PSAP corridor on April 10th, 17th, and 27th, 2015. The data includes short-term (10 minute) environmental noise samples collected using a sound level meter and digital data recorder.

This data was collected to supplement the long-term measurements all of which were made in the vicinity of grade crossings. The short-term samples were taken at greater distances from the PSAP alignment to support the impact analyses. In addition to noise data, passing cars and trucks on adjacent roadways were counted during the recording period where appropriate.

EQUIPMENT

The equipment used to collect the short-term noise samples included a B&K Type 2230 Sound Level Meter (S/N1258361) with B&K Type 4189 Microphone (S/N 2556012). The linear output signal from the sound level meter was recorded on a Sony PCM-D50 digital data recorder (S/N 1026786) with a sampling rate of 44.010 kHz. The Type I setup was calibrated using a NIST-traceable B&K Type 4230 Sound Level Calibrator (S/N 1510494).

MEASUREMENT LOCATIONS

A total of 28 short-term measurements were made at various locations along the PSAP corridor. Most of supplemental measurements were made in the more dense population centers, specifically Centralia, Elma and Aberdeen. Measurement locations are indicated in Figures 1 through 4. Half of the samples were collected at the same location as the long term measurements to determine relative noise levels for the locations at greater distances from the grade crossings.

DATA ANALYSIS

Noise samples recorded in .WAV format were analyzed using WIA proprietary software to compute a time series of 1-second contiguous samples resolved into 1/3 octave bands between 20 Hz and 20 kHz. From this time series, 10-minute Leq noise levels (dBA) were computed for each sample.

RESULTS

Data collected during the short-term noise survey are included in Table 1. The data includes the 10-minute L_{eq} at each location, observed noise sources and traffic counts.

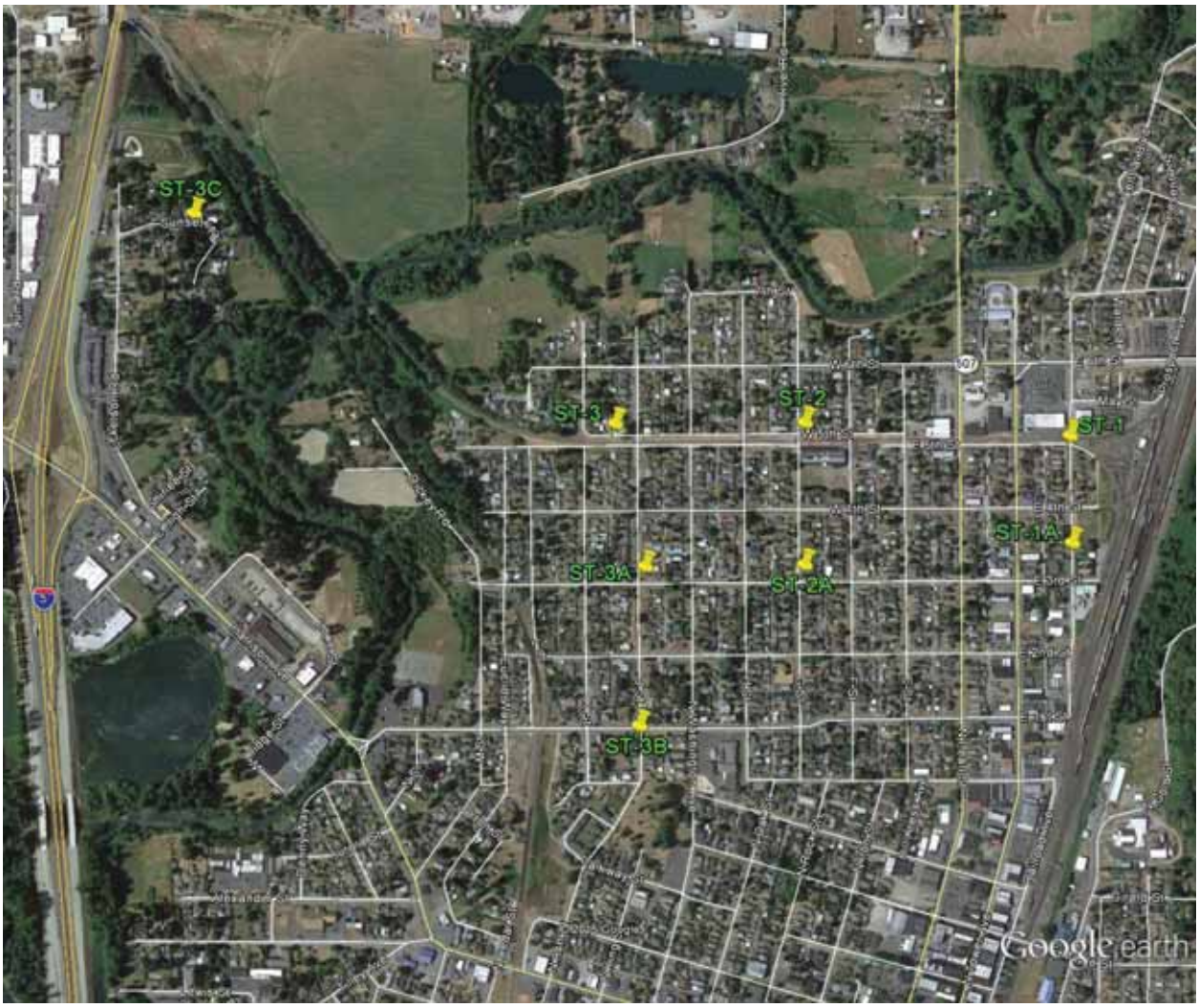

Figure 1: Short-term noise measurement locations, Centralia, WA

Figure 2: Short-term noise measurement locations, Rochester, WA

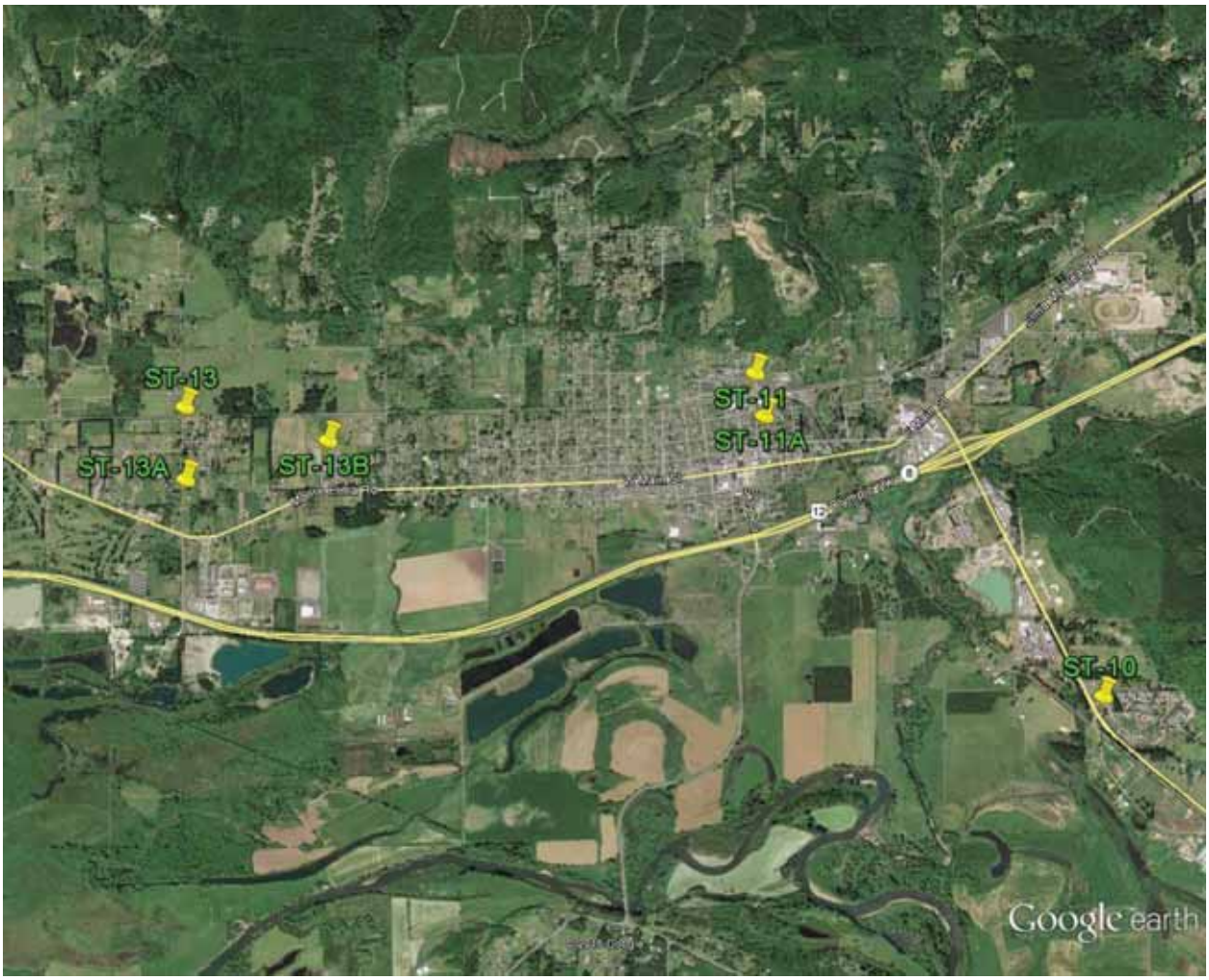

Figure 3: Short-term noise measurement locations, Elma, WA

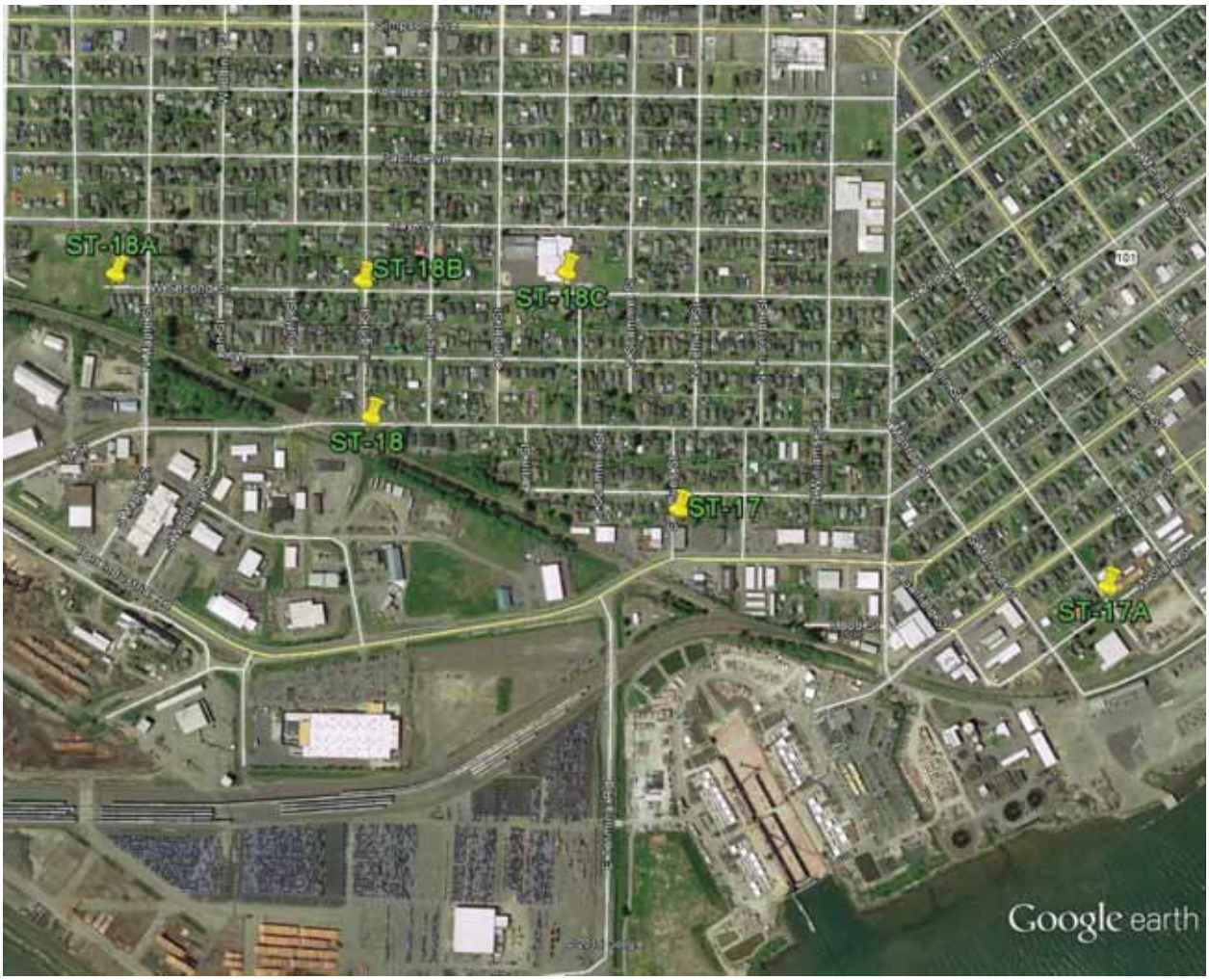

Figure 4: Short-term noise measurement locations, Aberdeen, WA

Table 1: Summary of short-term environmental noise measurements

LOCATION	ADDRESS	DATE & HOUR	10-min L_{eq} (dBA)	NOISE SOURCES
ST-1	1023 B St, Centralia	MON, 4/27, 11 AM	53	78 cars on C St. Trains on main line
ST-1A	909 B St, Centralia	MON, 4/27, 12 PM	48	Light industrial shop (Puget Sound Fiber)
ST-2	1102 G St, Centralia	MON, 4/27, 12 PM	47	2 cars
ST-2A	906 G St, Centralia	MON, 4/27, 12 PM	43	3 cars
ST-3	1103 J St, Centralia	MON, 4/27, 1 PM	40	Distant train horns
ST-3A	904 J St, Centralia	MON, 4/27, 12 PM	51	Children + 8 cars
ST-3B	802 W 1st St, Centralia	MON, 4/27, 1 PM	60	72 cars on W 1st (20 mph school zone)
ST-3C	1603 Sunset Way, Centralia	MON, 4/27, 1 PM	51	I-5, birds
ST-6	19318 Grand Mound, Rochester	FRI, 4/10, 1 PM	65	170 cars + 6 trucks On Hwy 12
ST-6A	19111 Joselyn Rd SW, Rochester	MON, 4/27, 2 PM	59	12 cars (35 mph)
ST-7	9237 183rd Ave SW, Rochester	FRI, 4/17, 1 PM	62	50 cars locally 11 trucks on Hwy 12
ST-8	180th Way & Littlerock Rd, Rochester	FRI, 4/10, 12 PM	62	20 cars
ST-10	22 Evergreen Village Lane, Elma	FRI, 4/17, 1 PM	70	60 cars +6 trucks On Hwy 12
ST-11	513 N 2nd St, Elma	FRI, 4/17, 2 PM	52	4 cars
ST-11A	115 W Anderson St, Elma	MON, 4/27, 7 PM	53	Lawnmower, dogs, 3 cars
ST-13	57 Hurd Road, Elma	FRI, 4/17, 2 PM	47	1 car
ST-13A	25 Hurd Road, Elma	MON, 4/27, 7 PM	57	3 cars
ST-13B	Elma Elementary School	MON, 4/27, 7 PM	44	Children, birds
ST-16	140 S Chehalis St, Aberdeen	MON, 4/27, 5 PM	59	317 cars + 1 truck On E Wishkah St
ST-16A	S Chehalis & Henry Alley, Aberdeen	MON, 4/27, 6 PM	45	E Wishkah St
ST-17	102 S Jefferies St, Aberdeen	MON, 4/27, 4 PM	55	195 cars + 10 trucks
ST-17A	311 S Lincoln St, Aberdeen	MON, 4/27, 5 PM	53	6 cars
ST-18	2100 1st St, Aberdeen	FRI, 4/17, 3 PM	58	20 cars, children
ST-18A	2408 W 2nd St, Aberdeen	MON, 4/27, 3 PM	47	children
ST-18B	2101 W 2nd St, Aberdeen	MON, 4/27, 4 PM	54	5 cars
ST-18C	AJ West Elementary School	MON, 4/27, 4 PM	52	Children, lawnmower
ST-19	11846 170th Ave SW, Rochester	FRI, 4/10, 10 AM	50	6 cars 2 medium trucks
ST-20	7220 Central Park Dr, Aberdeen	FRI, 4/10, 11 AM	51	6 cars