BASELINE NOISE ASSESSMENT

For

MM PORT FZE PROJECT ESIA

EXECUTIVE SUMMARY

Overview: The noise study of the proposed project area was conducted from July 4th to July 17th, 2023. The exercise was carried out in compliance with statutory requirements. A total of fourteen (14) sampling stations were monitored for the assessment of existing baseline ambient noise status of the project environs. Twelve (12) stations were established within and around project site, while two (2) stations were established outside the project site as control stations.

Methodology: existing baseline noise levels of the proposed project area were measured using a Type 1 digital Cygnet integrated data logging sound level data logger (model 2001), which logged data continuously over the period of time. The instrument was programed to log or record data at every one (1) minute) interval. The noise monitoring was conducted for both daytime and nighttime.

Result: Baseline result obtained during daytime monitoring indicated that the daytime noise levels varied from 41.1dBA (minimum) at station N3 to 55.7 (maximum) at station NC1. L_{10} was minimum (48.4dBA) at station N1 and maximum (52.9dBA) at station N7; L_{50} was minimum (47.0dBA) at station N10 and maximum (50.8dBA) at station NC1; L_{90} was minimum (45.6dBA) at station N11 and maximum (48.2dBA) at station NC. Daytime L_{eq} was minimum (47.1dBA) at station N10 and maximum (51.1dBA) at station NC1; while nighttime L_{eq} was minimum (38.6dBA) at station N12 and maximum (39.9 dBA) at station N2, N9 & NC1. These values are below both NESREA and IFC permissible limits and represent the baseline noise environment of the proposed project area before construction and operation activities.

Identified existing potential sources of noise around the project site is operation of construction equipment and, vehicular movement.

1. Introduction

Field monitoring exercise of noise levels for the proposed project was conducted from July 4th to July 17th, 2023, in compliance with statutory requirements. Ambient noise monitoring was required to determine the existing noise environment of the proposed project area. Prolonged exposure to noise of value higher than specified limits can result in temporary hearing loss (temporary threshold shift) or permanent hearing loss (permanent threshold shift). (Sheela, 2000).

2. Methodology

2.1 Sampling Strategy

The noise survey was carried out at fourteen (14) sampling stations (shown in Table 1) within the proposed project geographical zone. The ten (10) out of the fourteen (14) stations were located within the proposed site, two (2) located around project site, while two (2) control stations were located about 2 to 3kilometers away from the project site.

A brief description of the sampling stations relative to the project site, sampling station codes, and coordinates are presented in Table 1 and on Google earth map shown in Figure 1. The first controls station (ANC1) was monitored at Owo gono community, located approximately 1.8km from the project site; while the second control station (ANC2) was monitored at Ele community, located about 2.7km from the project site.

Table 1: Sampling stations and Coordinates

Station	Description	Latitude	Longitude
N1	Within the project site boundary in South, Southeast directions	4°40'00.60"N	7°8'47.40"E
N2	Within the project site boundary in South, Southwest directions	4°40'02.30"N	7°8'37.88"E
N3	Within the project site boundary in South, Southwest directions	4°40'05.95"N	7°8'28.79"E
N4	Within the project site boundary in West, South directions	4°40'07.01"N	7°8'20.89"E
N5	Within the project site boundary in West, Northwest directions	4°40'22.98"N	7°8'21.48"E
N6	Within the project site boundary in North, Northwest directions	4°40'22.62"N	7°8'30.84"E
N7	Within the project site boundary in North, Northeast, Southeast directions	4°40'19.76"N	7°8'42.39"E
N8	Inside the project site	4°40'10.79"N	7°8'41.83"E
N9	Middle of project site	4°40'09.97"N	7°8'29.96"E
N10	Inside the project site	4°40'07.56"N	7°8'45.88"E

Station	Description	Latitude	Longitude
N11	Within the project site boundary in South, Southeast directions	4°40'05.08"N	7°8'51.93"E
N12	Within the project site boundary in East, North, Southeast, directions	4°40'17.68"N	7°8'52.74"E
NC1	Outside the project site boundary in South, Southeast directions (After river) – Owo gono cummunity	4°39'33.39"N	7°9'21.92"E
NC2	Outside the project site boundary in Northeast, Southeast directions (After river) – Ele community	4°41'23.76"N	7°9'39.04"E

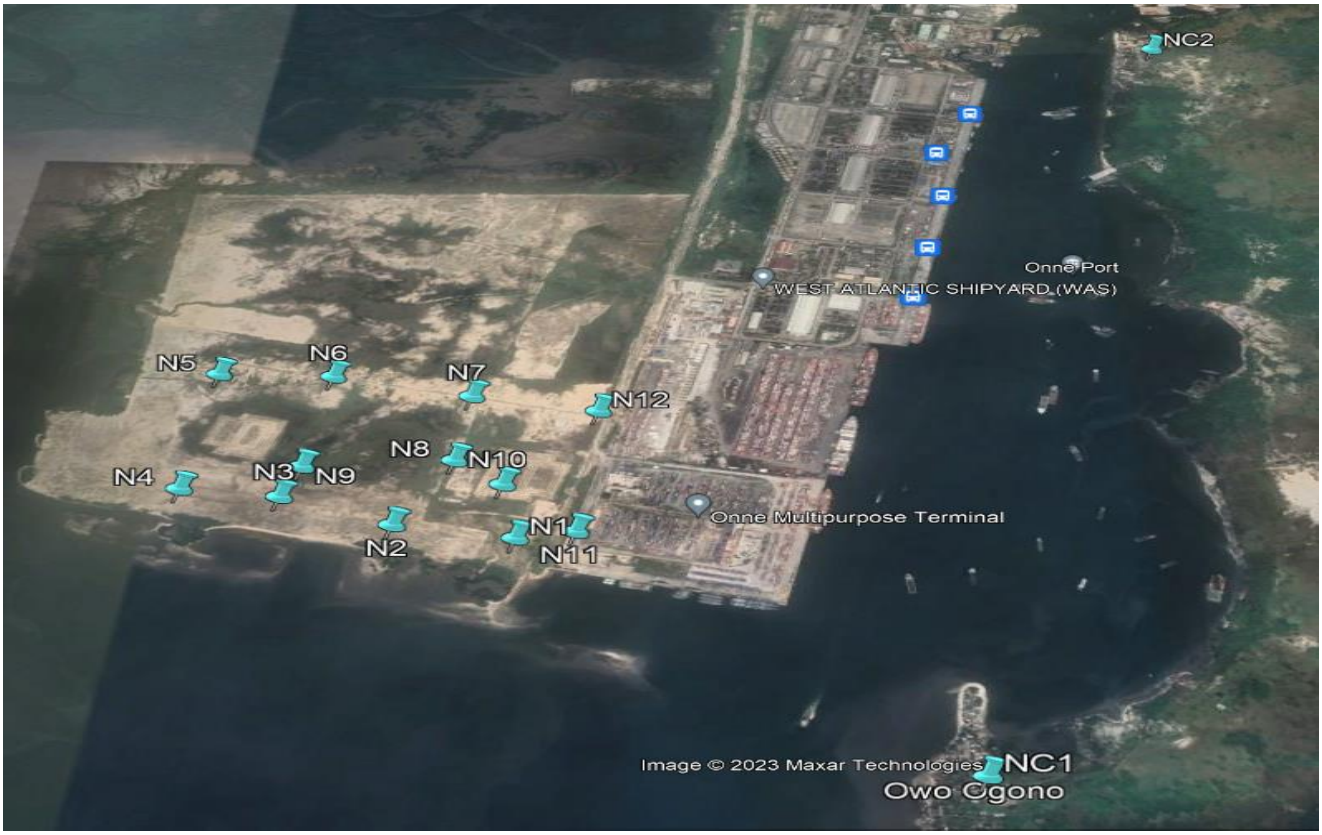

Figure 1: map showing ambient noise monitoring stations

2.2 Instrumentation and Sampling Techniques

Noise monitoring were undertaken using the CYGNET Integrating Datalogging Sound Level Meter 2001. This datalogging Sound Level Meter is Type 1 accuracy (Precision grade) instrument conforming to IS 9779:1981 and Class 1 IEC 61672:2013 with built-in smart integrating algorithms. The equipment has a measuring range of 34-134 dB in three scales, each with a dynamic range of 50 dB. The scales are 34-84 dB, 54-104 dB, 84-134. It also measures noise with A, C and Lin weightings. A slow, fast, and impulse time response is provided on the equipment, it can store up to 128K readings in its memory and the time interval between readings may be set between 0.025 seconds and 9999 seconds. It was calibrated with a digital Multi- Range Sound

Acoustic Calibrator. The instrument measure noise levels via a microphone probe that generates signals appropriately proportional to sound waves. The sensor of the noise meter was directed up wards and the reading were recorded by instrument in one-minute intervals. In day hours monitoring period was for five to seven hours whereas in night hours monitoring period was one hour. In day hours monitoring was performed in between 8 AM to 6PM and in night hours in between 11:00PM to 6AM when there was no rain, and the wind speed is less than 5m/s. The instrument was placed approximately 1.5m above the ground level in open terrain and no closer than 3m to any reflecting surface. The recorded noise data were downloaded and processed by using DL03 software to get the various noise indices.

Table 3: Monitoring station details

Station Code	**Sampling Location**	**Monitoring Date**	**Monitoring duration (min.)**		**Remark or Field Observation, if any**
			Day	**Night**	
N1	Within the project site boundary in South, Southeast directions	04/07/23	367	60	Sound from singing birds, Nigerian Navy Ship base, port activities
N2	Within the project site boundary in South, Southwest directions	05/07/23	330	60	Sound from singing birds, Nigerian Navy Ship base, port activities
N3	Within the project site boundary in South, Southwest directions	06/07/23	367	60	Sound from singing birds, Nigerian Navy Ship base, port activities
N4	Within the project site boundary in West, South directions	07/07/23	367	60	Sound from singing birds, Nigerian Navy Ship base, port activities
N5	Within the project site boundary in West, Northwest directions	08/07/23	420	60	Singing birds, earth moving equipment working on the northern side of the project site
N6	Within the project site boundary in North, Northwest directions	09/07/23	304	60	Singing birds, earth moving equipment working on the northern side of the project site
N7	Within the project site boundary in North, Northeast, Southeast directions	10/07/23	367	60	Singing birds, earth moving equipment working on the northern side of the project site
N8	Inside the project site	11/07/23	367	60	Sound from singing birds, Nigerian Navy Ship base, port activities
N9	Middle of project site	12/07/23	367	60	Sound from singing birds, Nigerian Navy Ship base, port activities
N10	Inside the project site	13/7/2023	367	60	Sound from singing birds, Nigerian Navy Ship base, port activities
N11	Within the project site boundary in South, Southeast directions	14/7/2023	360	60	Sound from singing birds, Nigerian Navy Ship base, port activities
N12	Within the project site boundary in East, North, Southeast, directions	15/7/2023	429	60	Sound from Singing birds, earth moving equipment working on the northern side of the project site
NC1	Outside the project site boundary in South, Southeast directions (After river) – Owo gono cummunity	16/7/2023	300	60	Sound from domestic animals and singing birds
NC2	Outside the project site boundary in Northeast, Southeast directions (After river) – Ele community	17/7/2023	300	60	Sound from domestic animals and singing birds

3. Baseline Noise Results

The summary result of the noise levels measurement during field survey is presented in Table 4.

Table 4: Summary statistic of **Baseline** noise levels **of the proposed project area**

	Daytime							Night-Time					
	(dBA)							(dBA)					
Station	**Min.**	**Max.**	**L_{10}**	**L_{50}**	**L_{90}**	**L_{eq}**		**Min.**	**Max.**	**L_{10}**	**L_{50}**	**L_{90}**	**L_{eq}**
N1	41.9	53.9	48.4	47.3	45.8	47.4		35.9	40.3	39.3	38.6	36.8	38.7
N2	42.1	55.1	51.0	48.4	47.5	48.6		35.9	41.6	40.8	39.8	38.5	39.9
N3	41.1	52.6	49.3	48.1	47.1	48.2		41.1	52.6	40.9	38.3	37.5	38.5
N4	42.1	55.3	50.2	48.2	44.6	48.7		36.2	41.9	38.9	38.5	37.2	38.6
N5	42.1	53.7	49.5	47.9	45.6	48.1		36.1	41.8	40.2	38.5	36.9	38.7
N6	41.6	55.1	50.1	48.5	47.4	48.6		36.2	40.8	40.2	38.8	37.4	38.9
N7	41.9	55.4	52.9	48.8	47.9	49.2		36.6	41.9	41.1	39.7	38.1	39.4
N8	42.3	55.2	51.3	49.5	47.8	49.8		36.2	41.9	41.3	39.3	37.4	39.5
N9	41.7	55.6	50.0	49.0	48.1	49.1		36.1	41.9	40.9	39.8	38.7	39.9
N10	41.8	54.7	49.4	47.0	46.8	47.1		36.2	42.6	40.7	38.7	37.1	38.9
N11	41.8	54.5	50.3	48.5	45.6	48.9		36.1	41.8	39.1	38.7	37.2	38.8
N12	41.9	55.1	50.7	47.3	46.8	47.5		35.8	41.7	40.1	38.5	37.5	38.6
NC1	42.1	55.7	52.3	50.8	48.2	51.1		36.1	42.1	40.1	39.3	37.2	39.9
NC2	42.1	52.9	51.3	48.5	45.9	49.0		36.2	41.3	40.8	39.5	37.0	39.7

4. Discussion of results and findings

Baseline result obtained during daytime monitoring indicated that daytime noise levels varied from 41.1dBA (minimum) at station N3 to 55.7 (maximum) at station NC1. L_{10} was minimum (48.4dBA) at station N1 and maximum (52.9dBA) at station N7; L_{50} was minimum (47.0dBA) at station N10 and maximum (50.8dBA) at station NC1; L_{90} was minimum (45.6dBA) at station N11 and maximum (48.2dBA) at station NC1. Daytime L_{eq} was minimum (47.1dBA) at station N10 and maximum (51.1dBA) at station NC1; while nighttime L_{eq} was minimum (38.6dBA) at station N12 and maximum (39.9 dBA) at station N2, N9 & NC1. These values are below both NESREA (day 70dB(A), Night 60dB(A) and IFC permissible limits (Residential 55 (day) & 45 (night) and Commercial 70db(A)) represent the baseline condition of existing noise environment of the proposed project area before construction and operation activities.

Impact Identification

It should be noted that noise levels from pre-construction, construction & operation phases include the following:

- Earth works, Fabrication works.
- Vehicular movement
- Power generating engines.

Mitigation measures

- Noise rated equipment.
- Controlled vehicular movement.
- Aquatic enclosures with high noise generating equipment etc.

Conclusion

Baseline noise levels around the project area are generally low, below prescribed permissible limits. With appropriate noise control measures in place during construction and operation, noise levels shall be adequately controlled and impacts shall be minimized.

Ibekwe, T., Folorunso, D., Ebuta, A., Amodu, J., Nwegbu, M., Mairami, Z., Liman, I., Okebaram, C., Chimdi, C., Durogbola, B., Suleiman, H., Mamven, H., Baamlong, N., Dahilo, E., Gbujie, I., Ibekwe P. A. and Nwaorgu, O. (2016). Evaluation of the Environmental Noise Levels in Abuja Municipality using Mobile Phones. *Annals of Ibadan Postgraduate Medicine*, 14(2), 58-64.

Abulude, F.O., Fagbayide, S.D. and Akinnusotu, A. (2018). Assessment of Noise Levels from Noise Sources in Akure, Nigeria: A Preliminary Study. *Iraqi Journal of Science*, 59(4C), 2195-2210.

Calibration Certificate

WALDEN OILTECH SERVICES LIMITED

GU Ake- Eliozu , 32 Worlu Street, Eneka Road, Procana complex, 2nd Floor, Port Harcourt
MOBILE: 08033122641, 08180181350,08035088792
EMAIL: waldenoiltechservices@yahoo.com, info@waldenoiltechservices.com
Website: www.waldenoiltechservices.com

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CERTIFICATE OF CALIBRATION

Calibration Certificate No: WOSL/ESCLSLM21

CUSTOMER NAME: ENVIRONMENTAL & CHEMICAL SERVICES LIMITED

INSTRUMENT TYPE: NOISE DATA LOGGER

SERIAL NUMBER: A0720-1741

MODEL CYGNET

ENVIRONMENTAL DETAILS:

TEMP: 26 Deg.+/-5C Relative Humidity: 70% +/-15%

SOUND CALIBRATION DATA

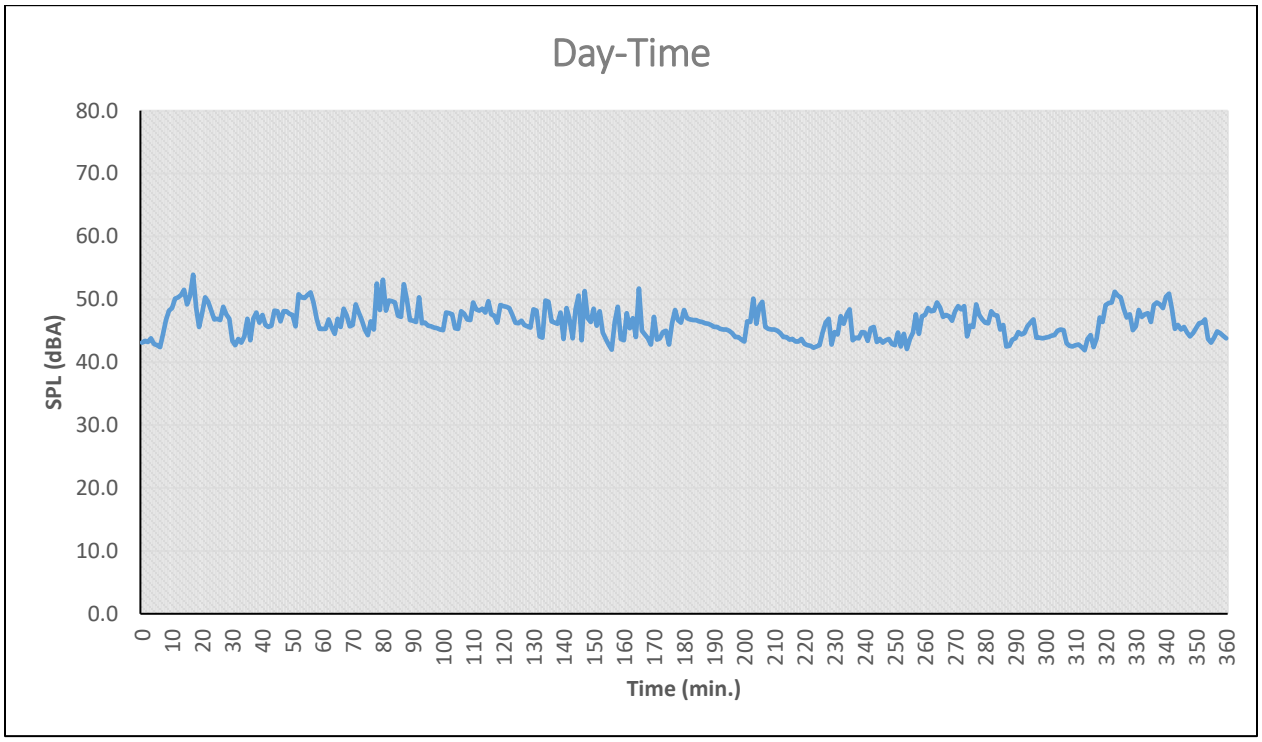
STANDARD	READINGS	ERROR	Remarks
94	94.0	0.0	PASS
114	114.0	0.0	PASS

The above equipment was calibrated using Extech Sound calibrator, model 407722 (S/N: 11094167).
The calibration is traceable to the National Standards which realize the units of measurement according to the International System of Units (S.I) ISO 10012-1 and ANSI/NCSL Z540-1-1994.

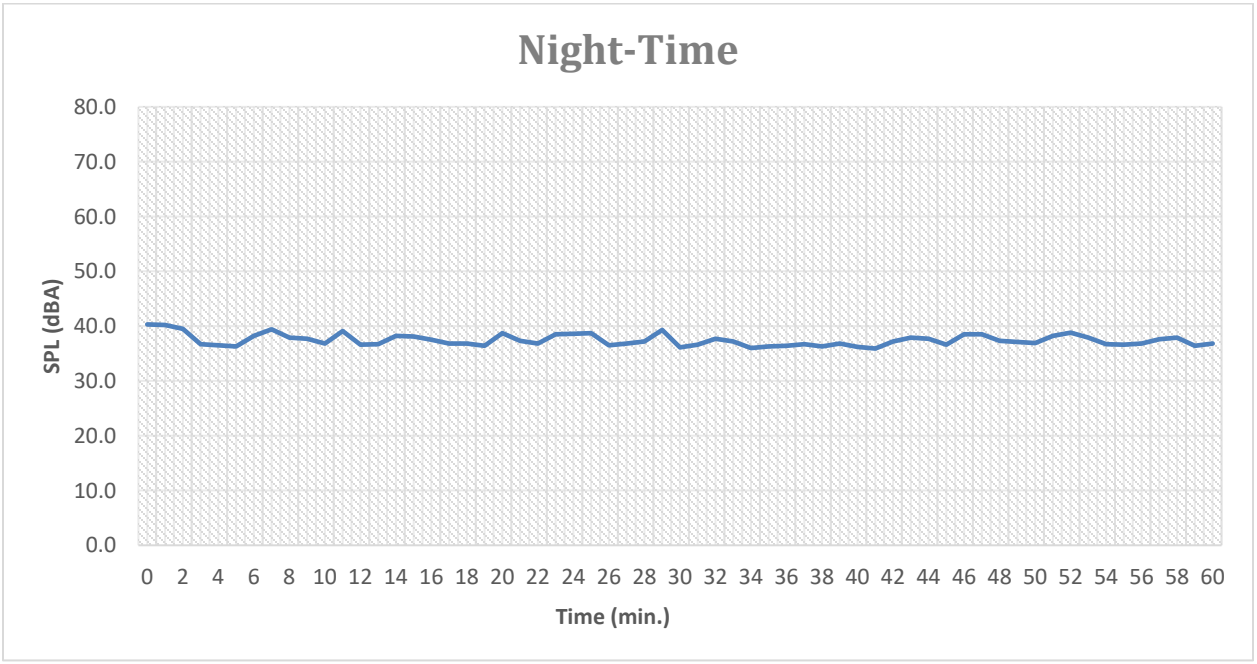
CALIBRATED BY:

NAME: ADENIYI OLAWALE
TITLE: SERVICE ENGINEER
SIGNATURE: ----------
DATE OF CALIBRATION: 02/08/2021
DATE OF NEXT CALIBRATION: 01/08/2022

Time series Noise Graphs



N1 – Day Hours



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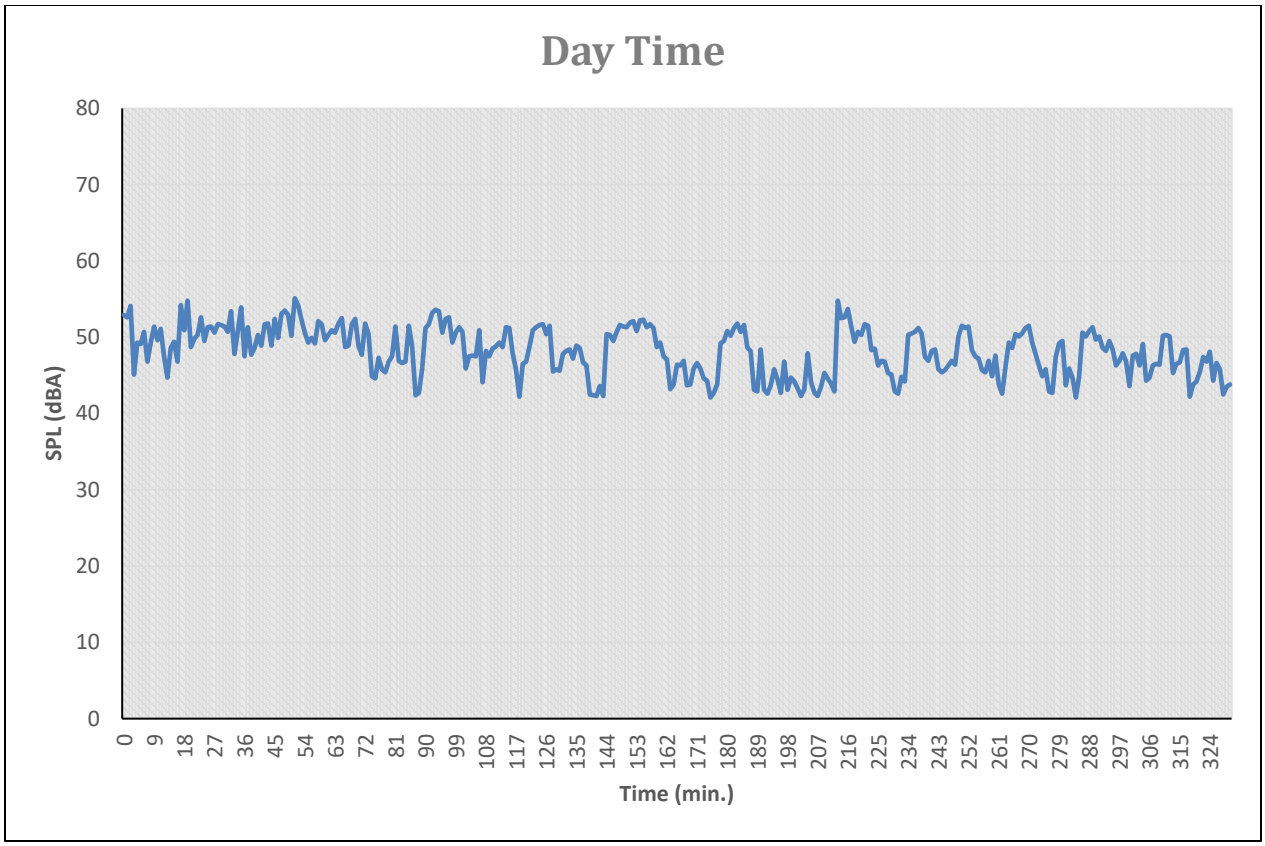
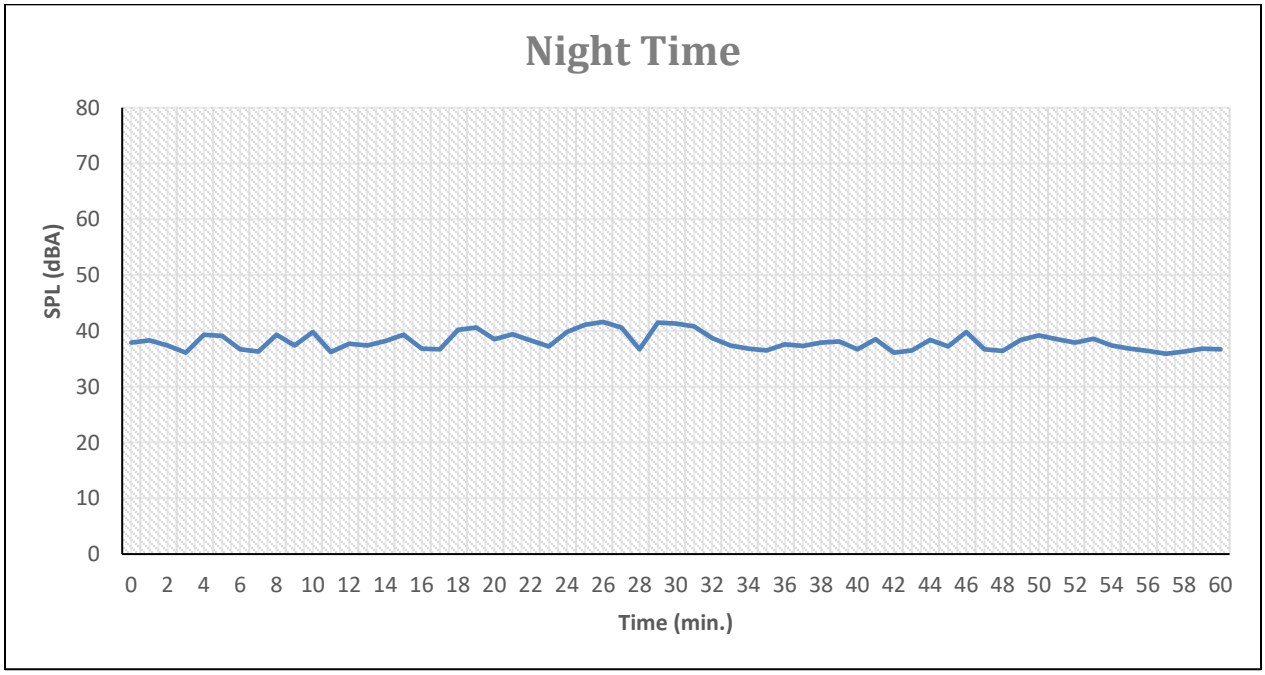
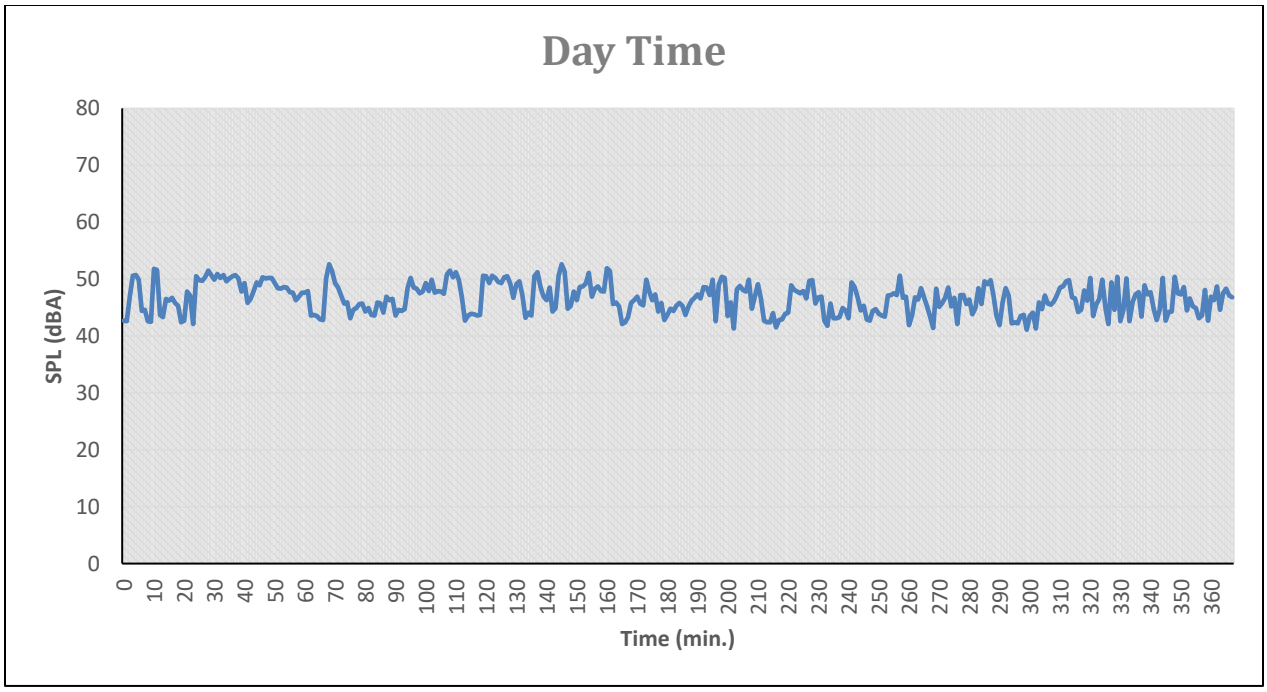


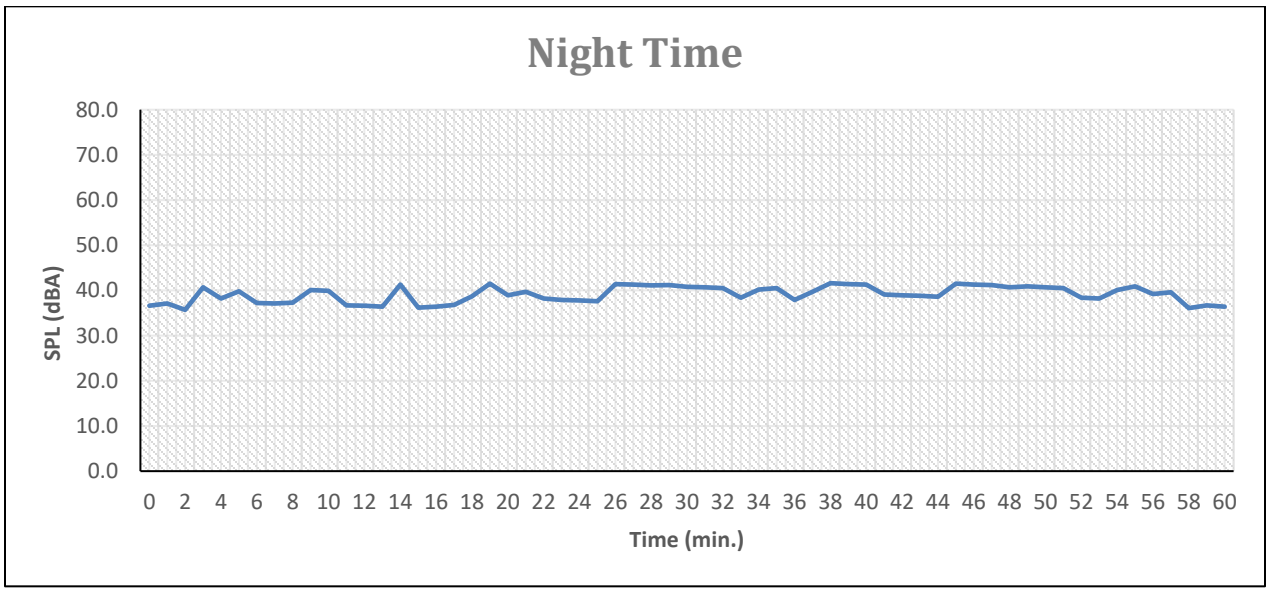
N2 – Day Hours



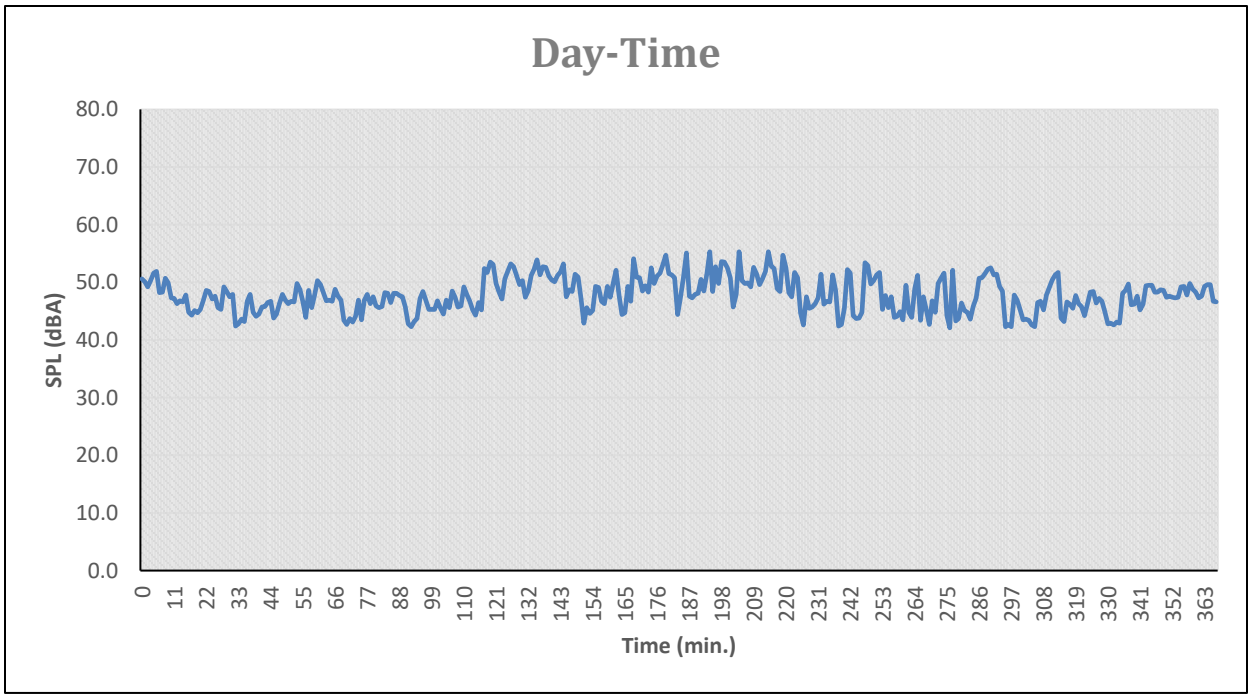
N2 – Night Hours



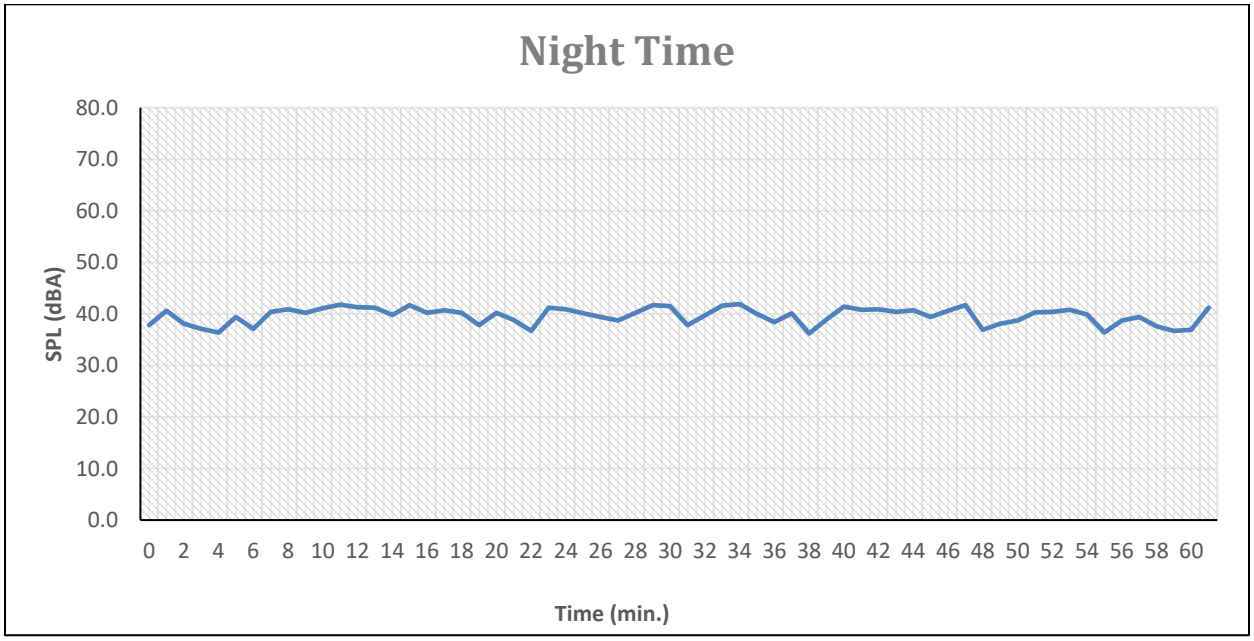
N3 – Day Hours



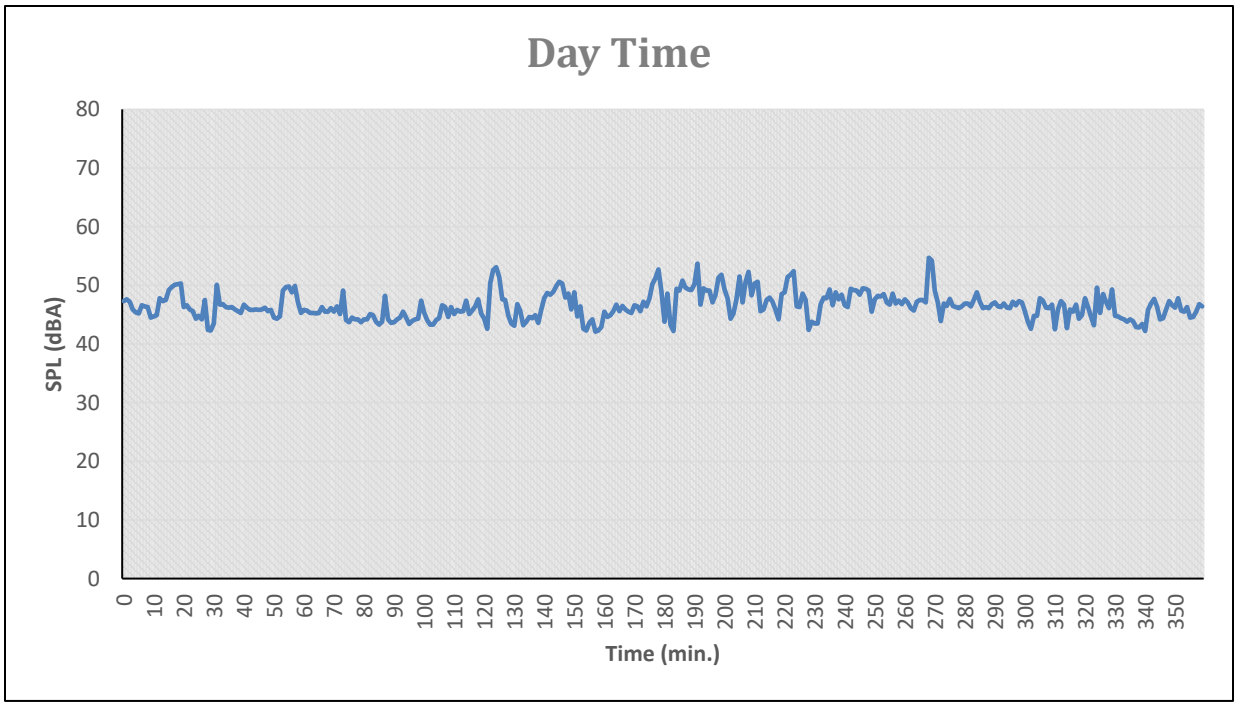
N3 – Night Hours



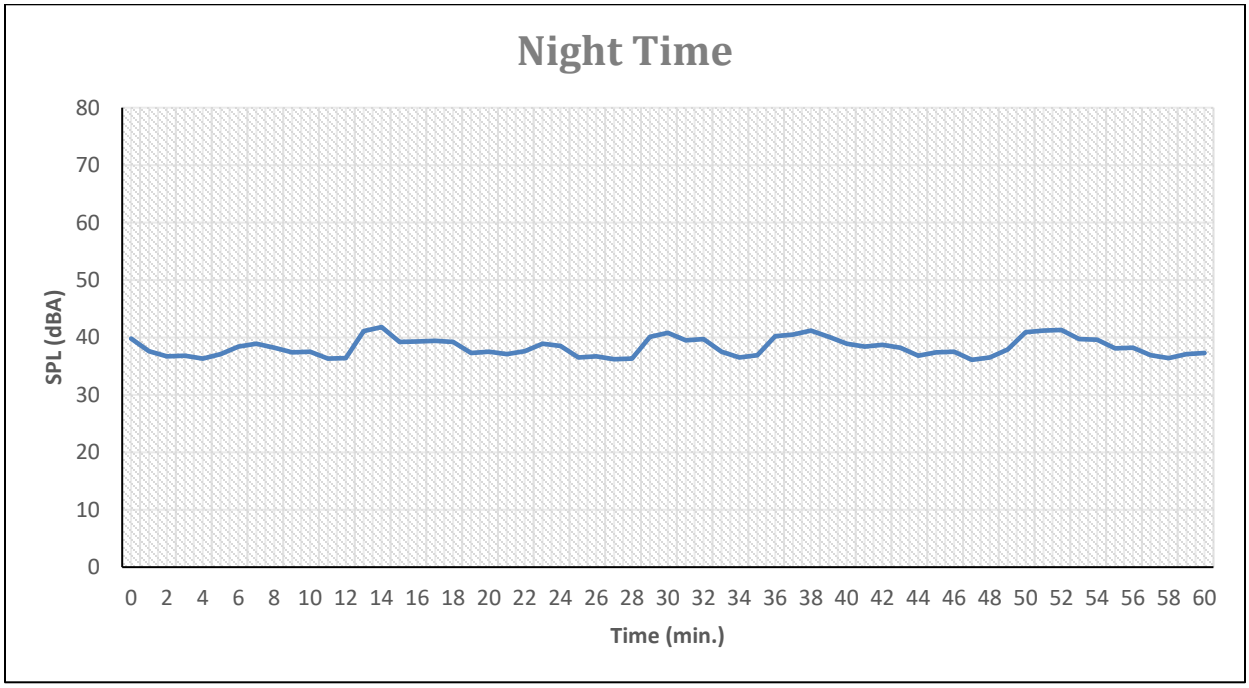
N4 – Day Hours



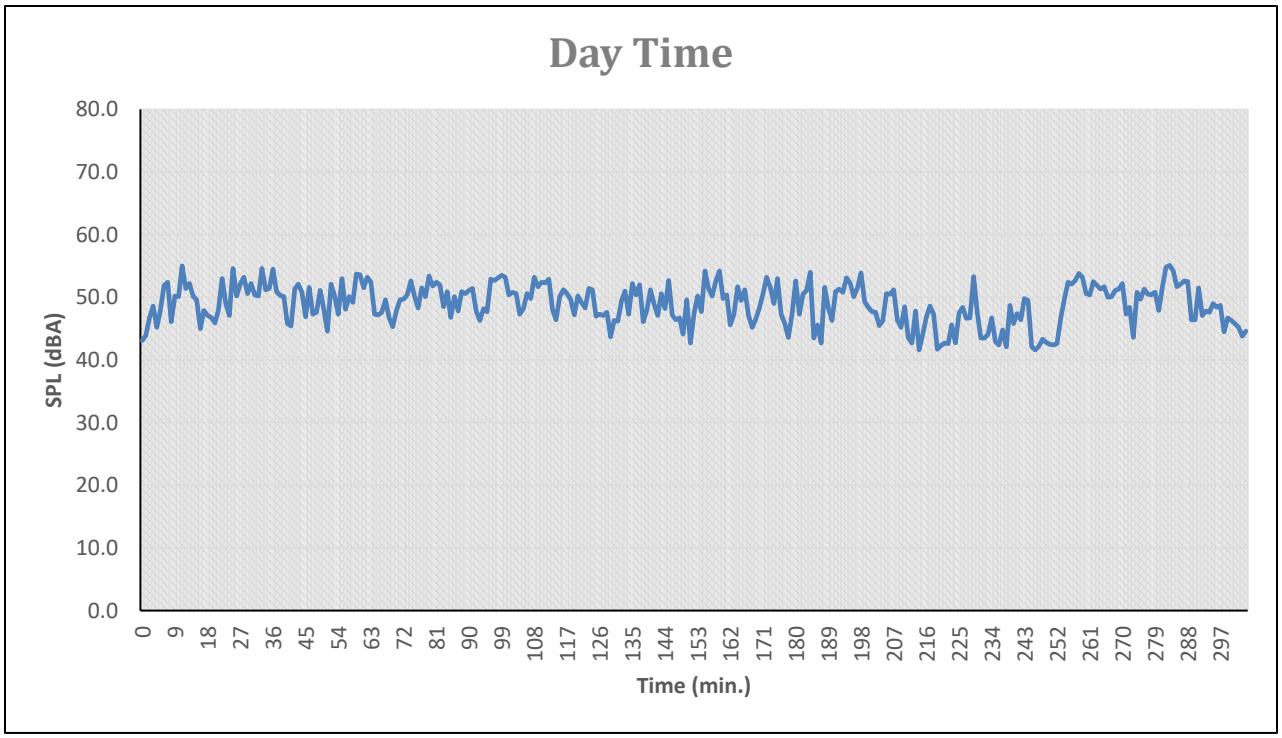
N4 – Night Hours



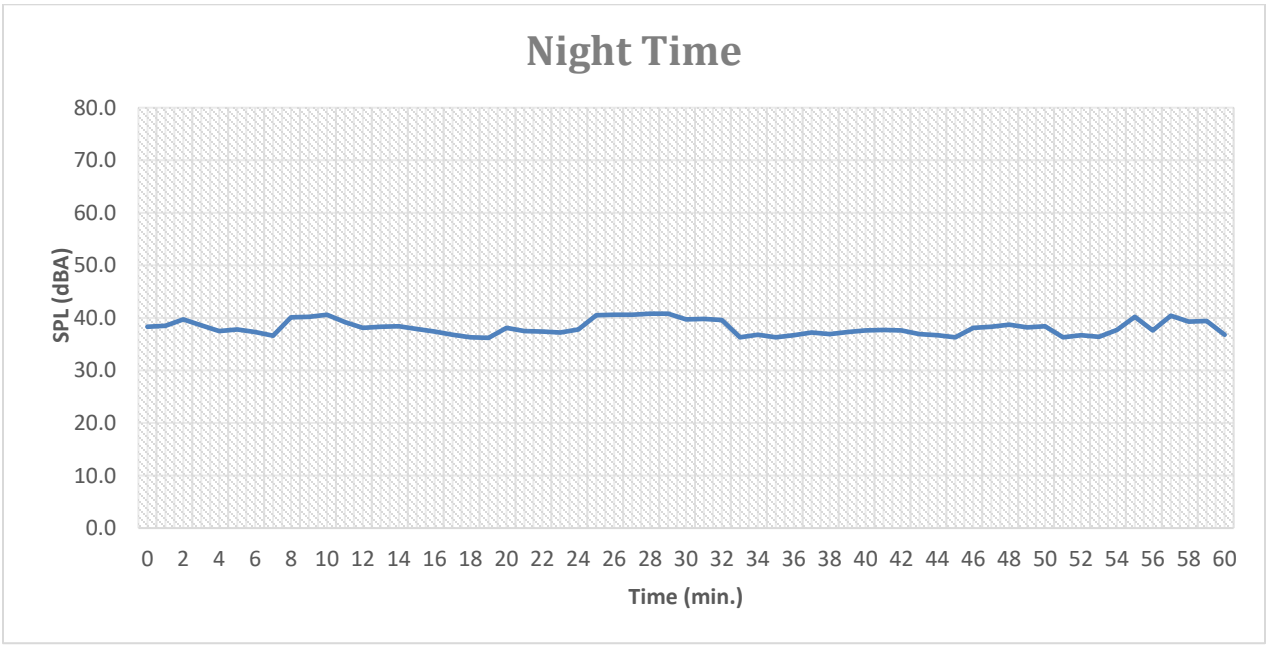
N5 – Day Hours



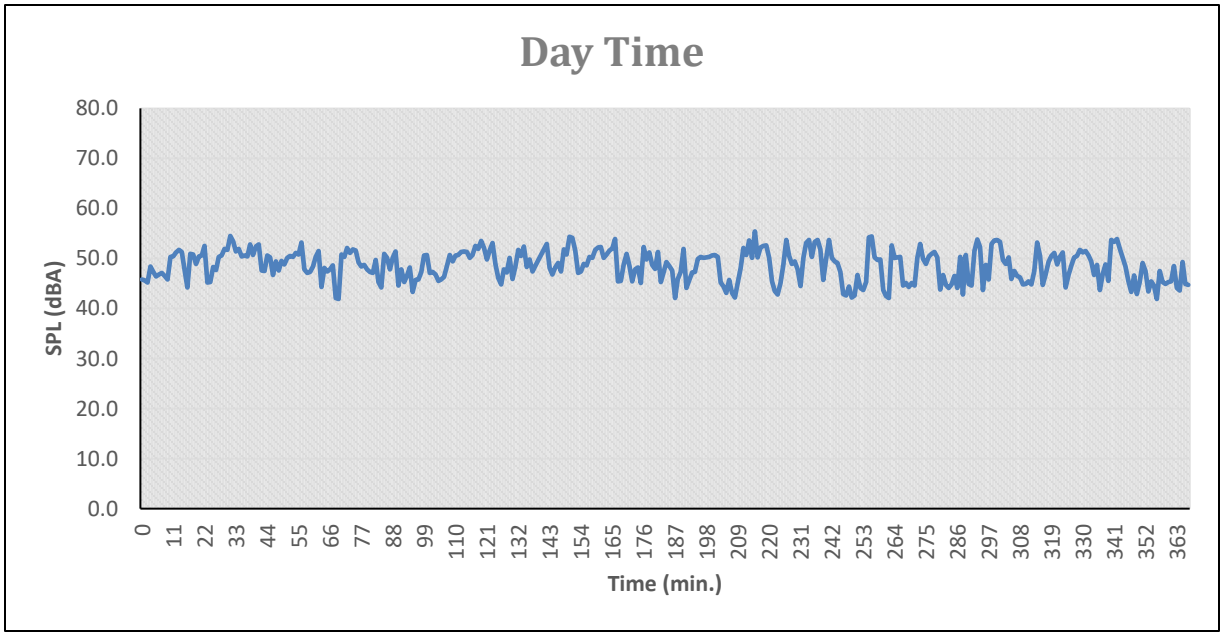
N5 – Night Hours



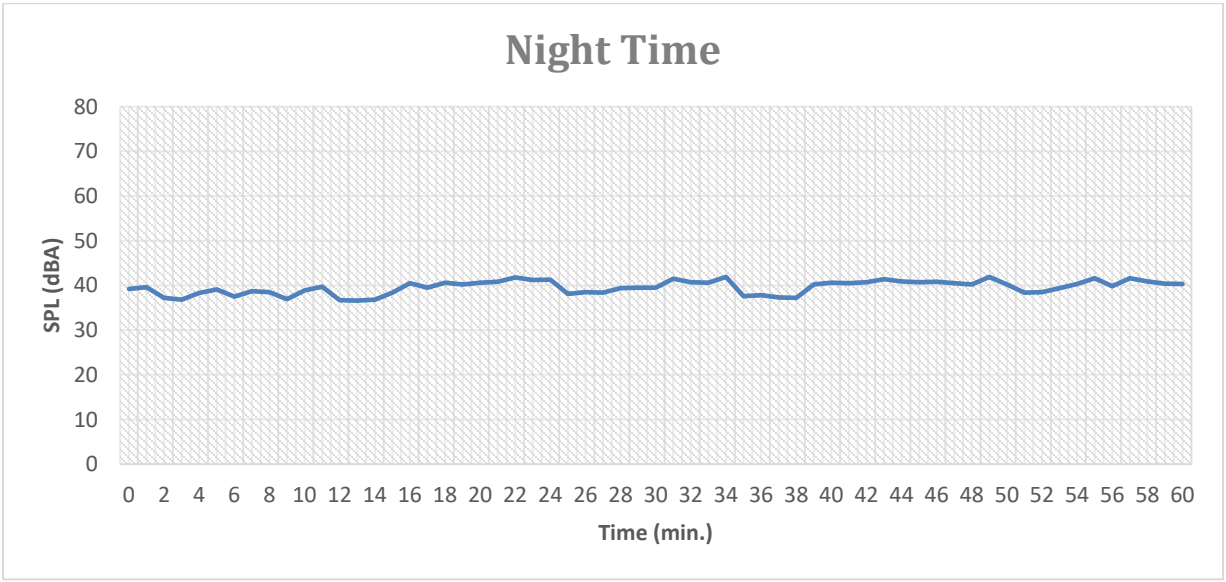
N6 – Day Hours



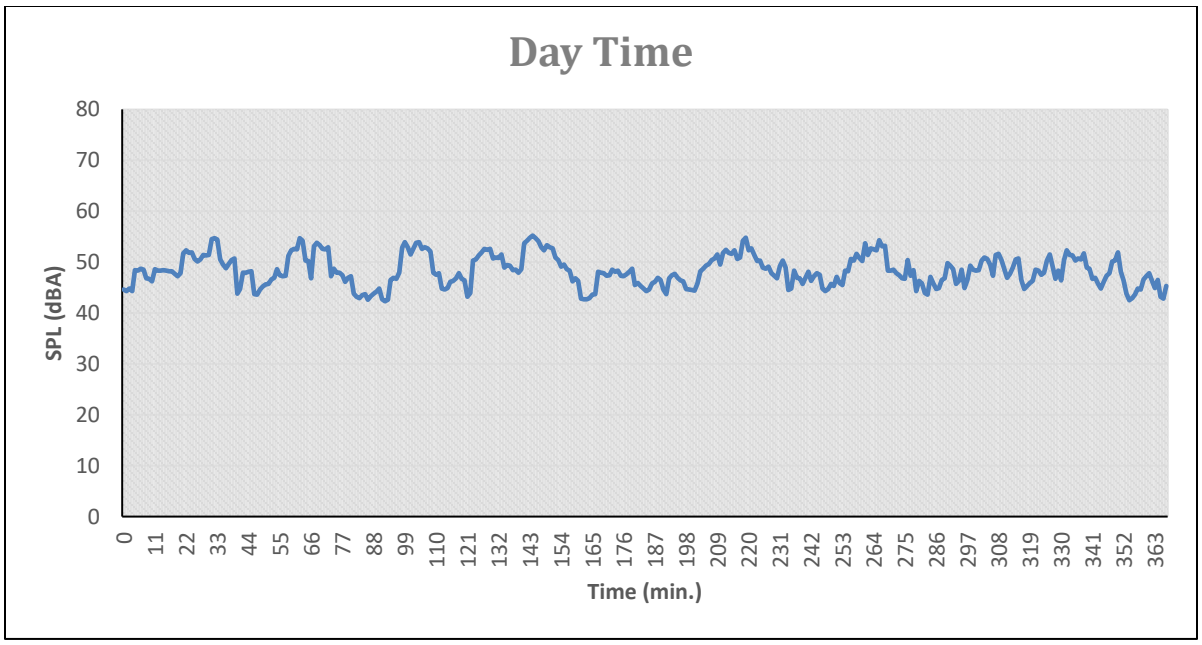
N6 – Night Hours



N7 – Day Hours



N7 – Night Hours



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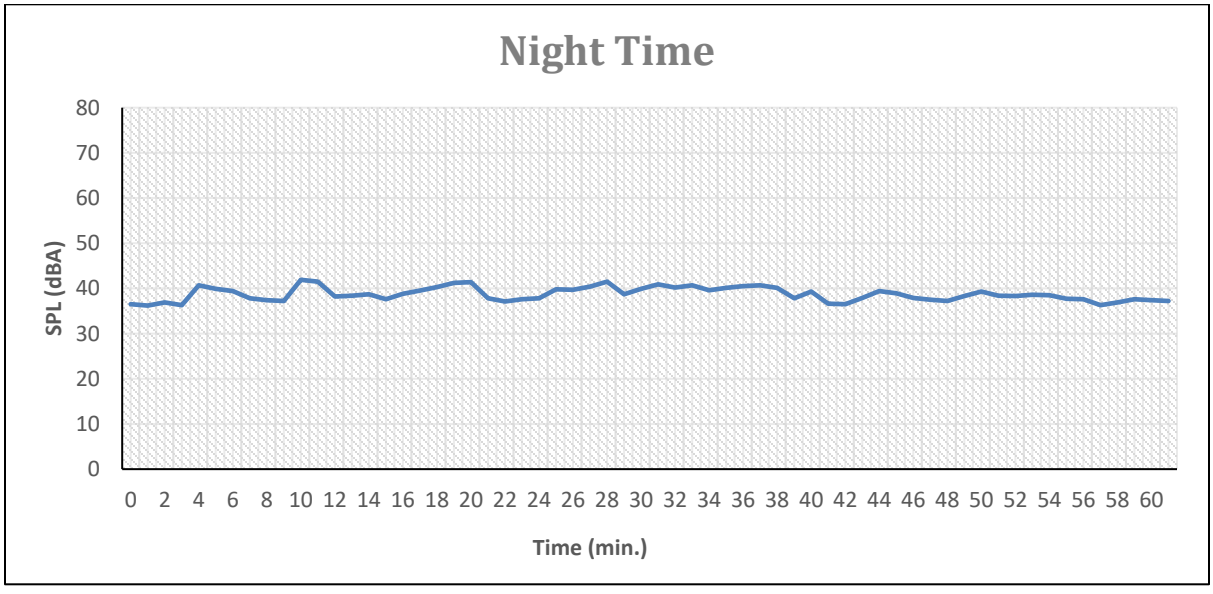

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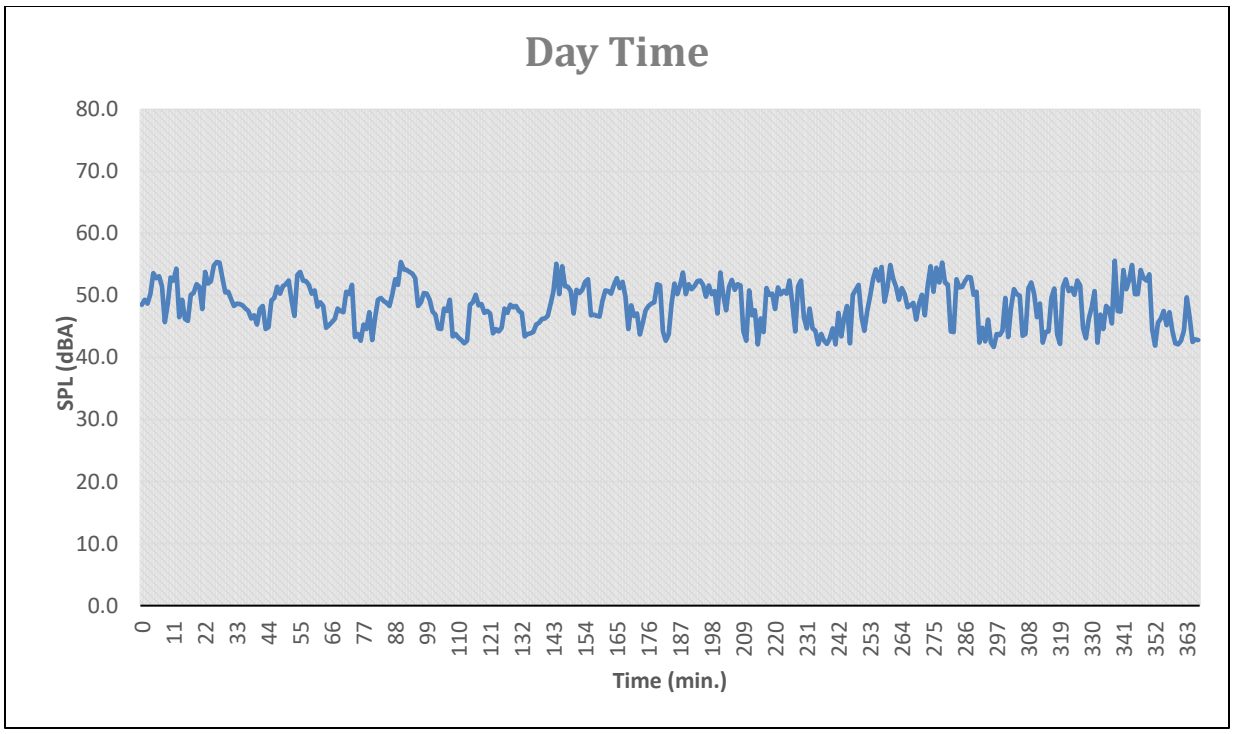
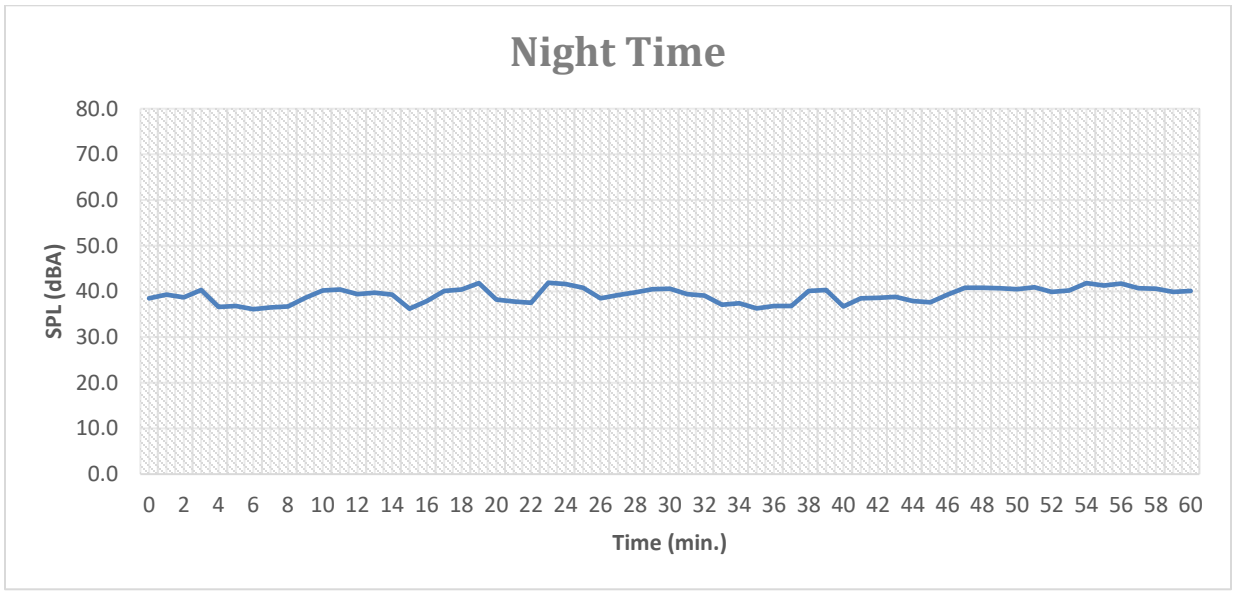
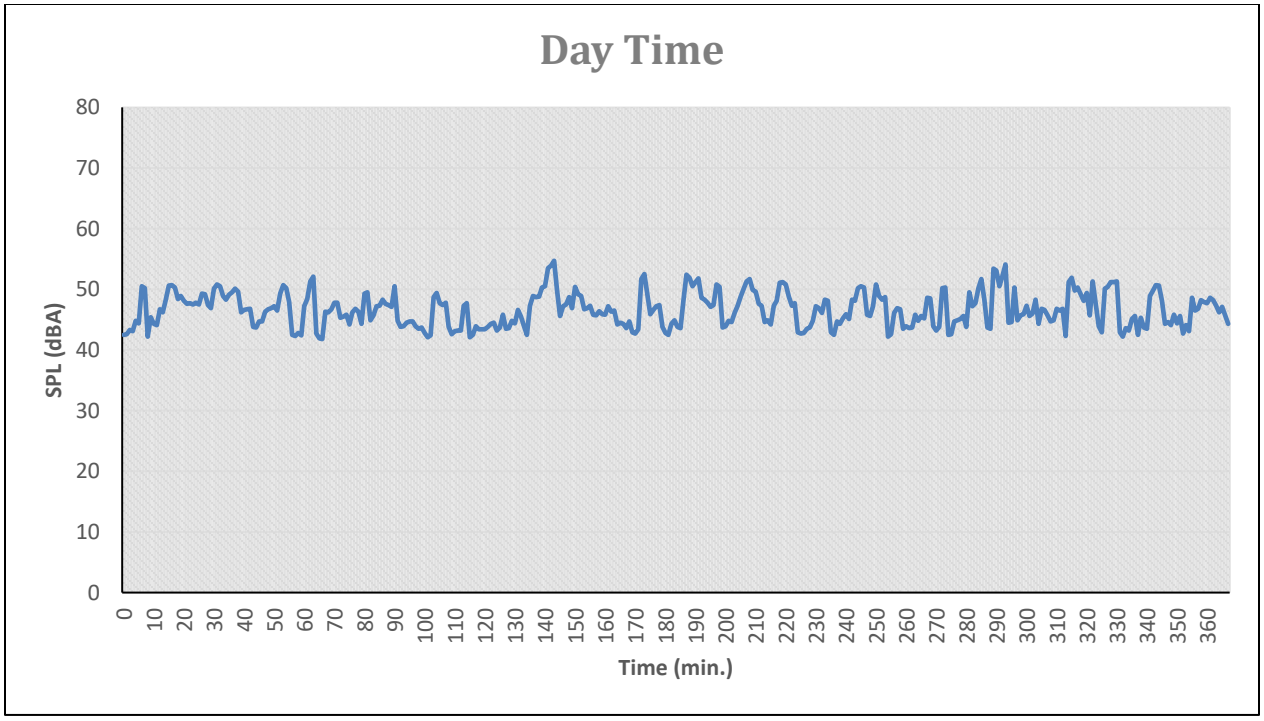


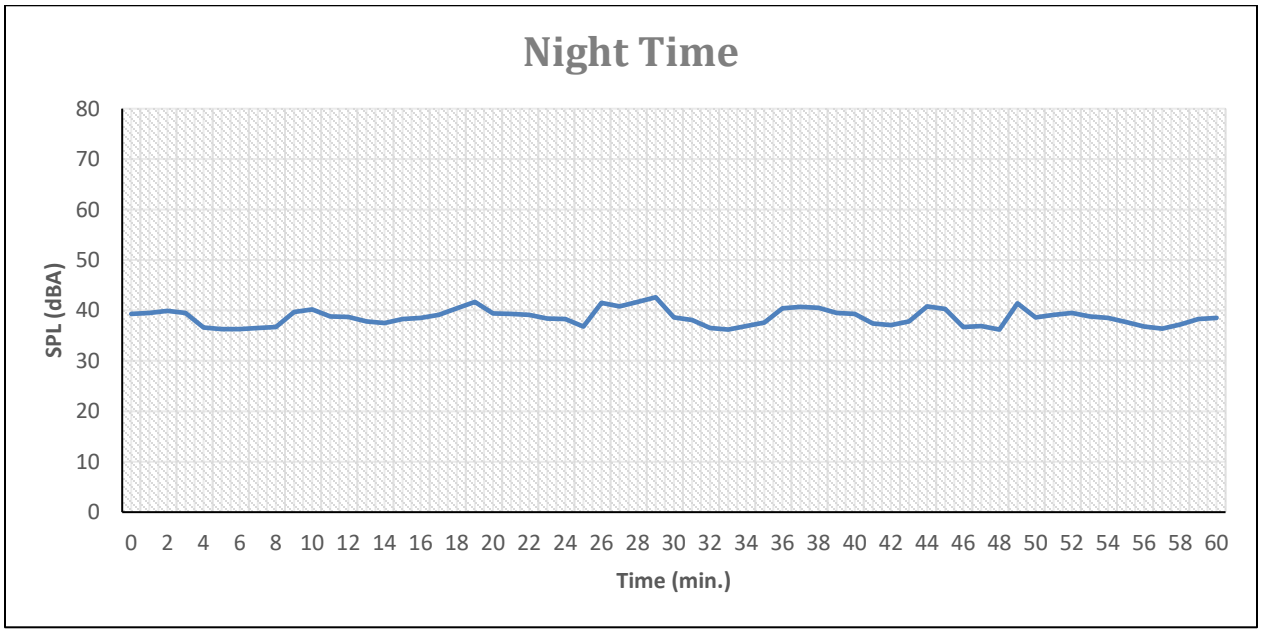
N9 – Day Hours



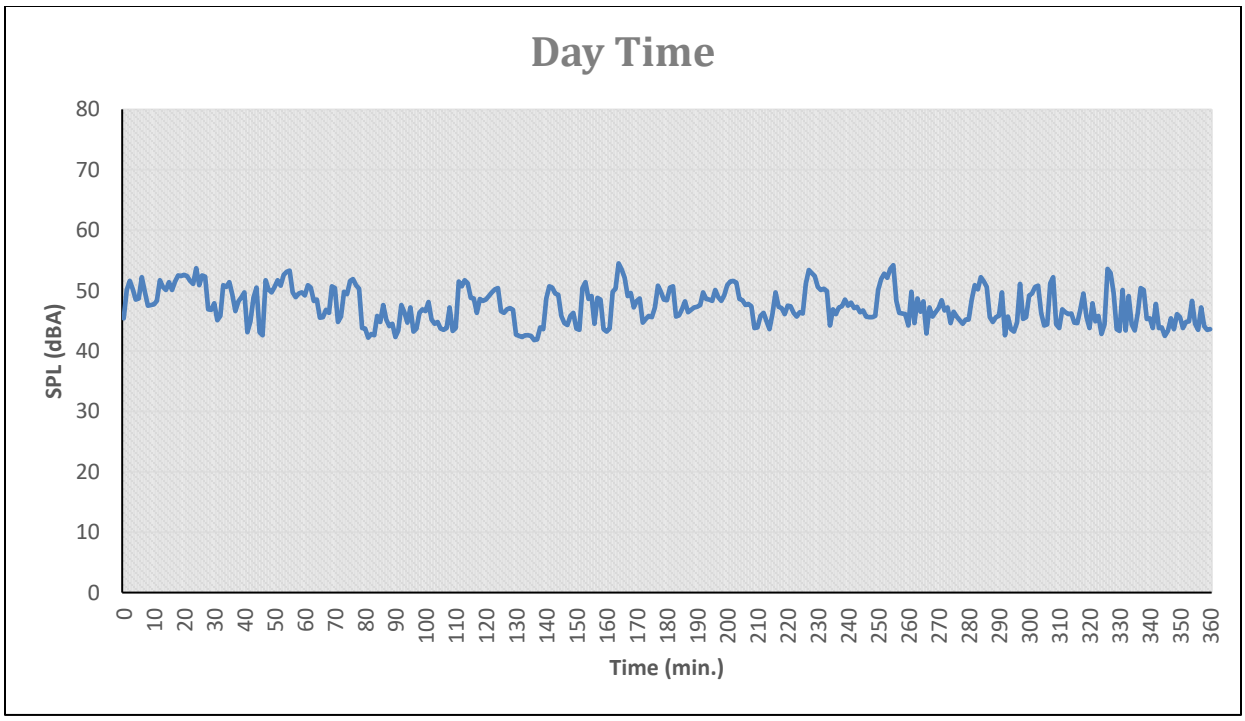
N9 – Night Hours



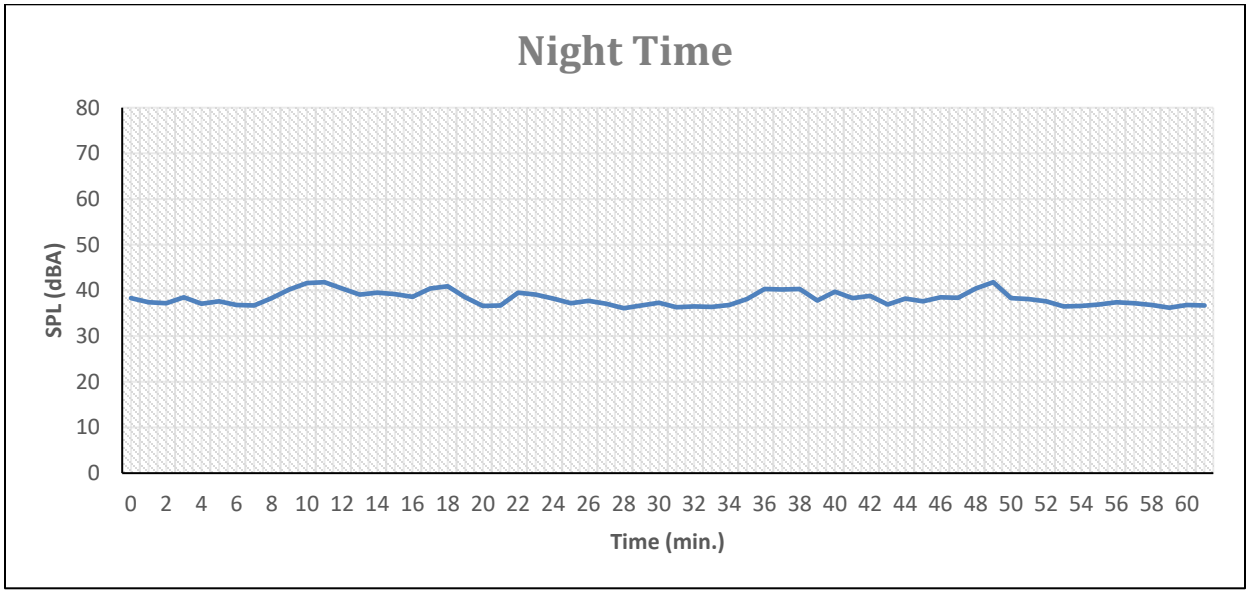
N10 – Day Hours



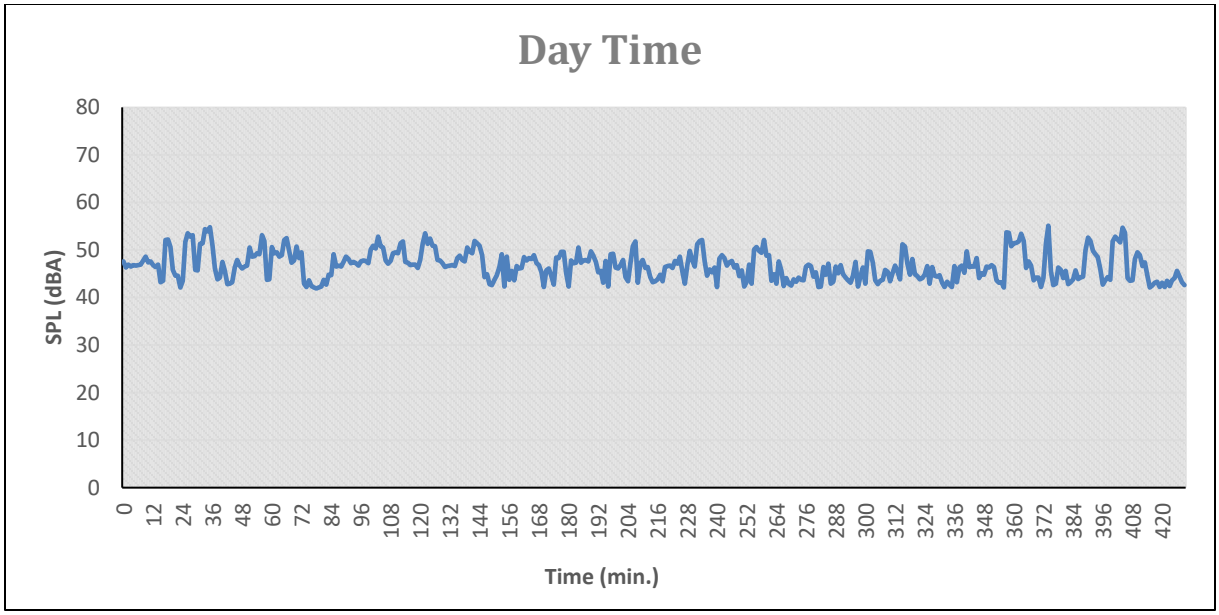
N10 – Night Hours



N11 – Day Hours



N11 – Night Hours



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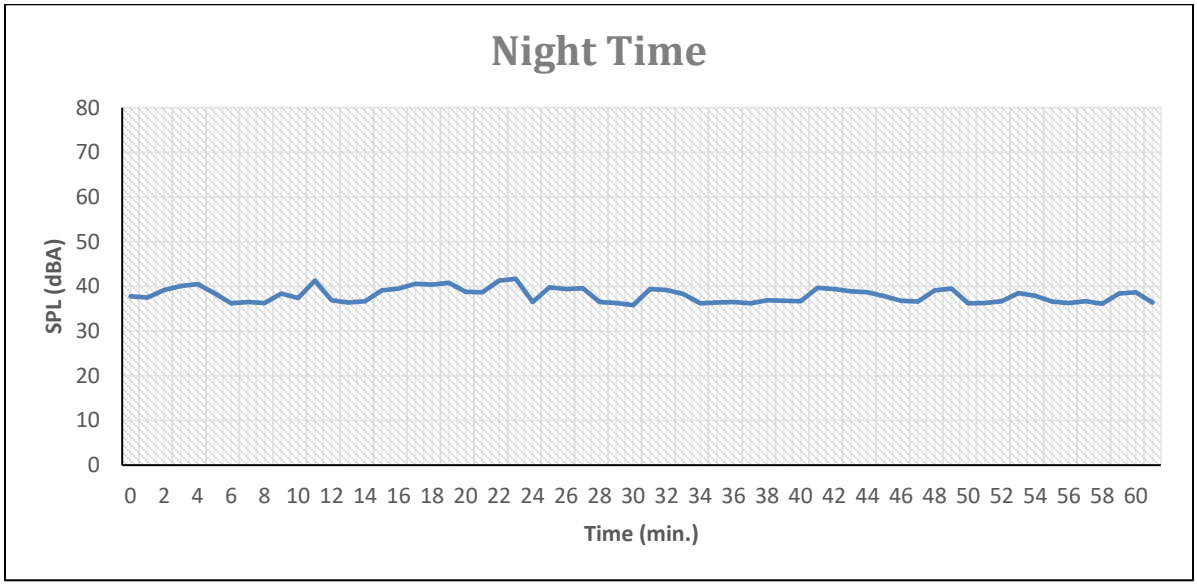

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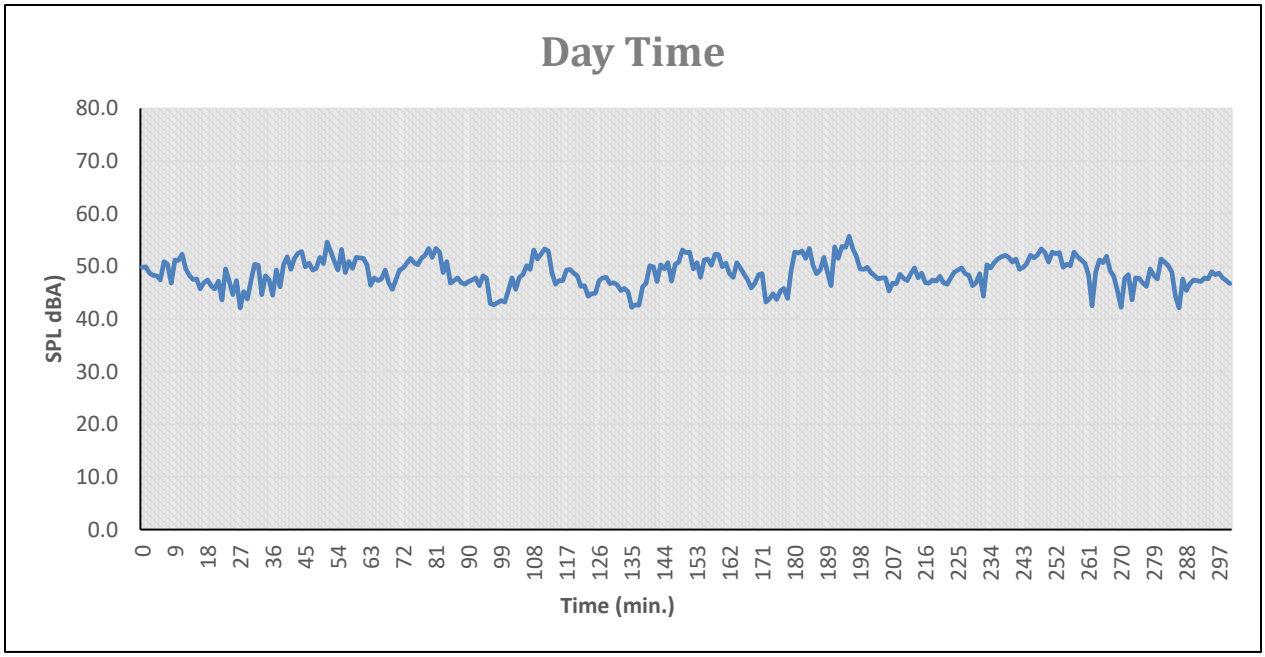
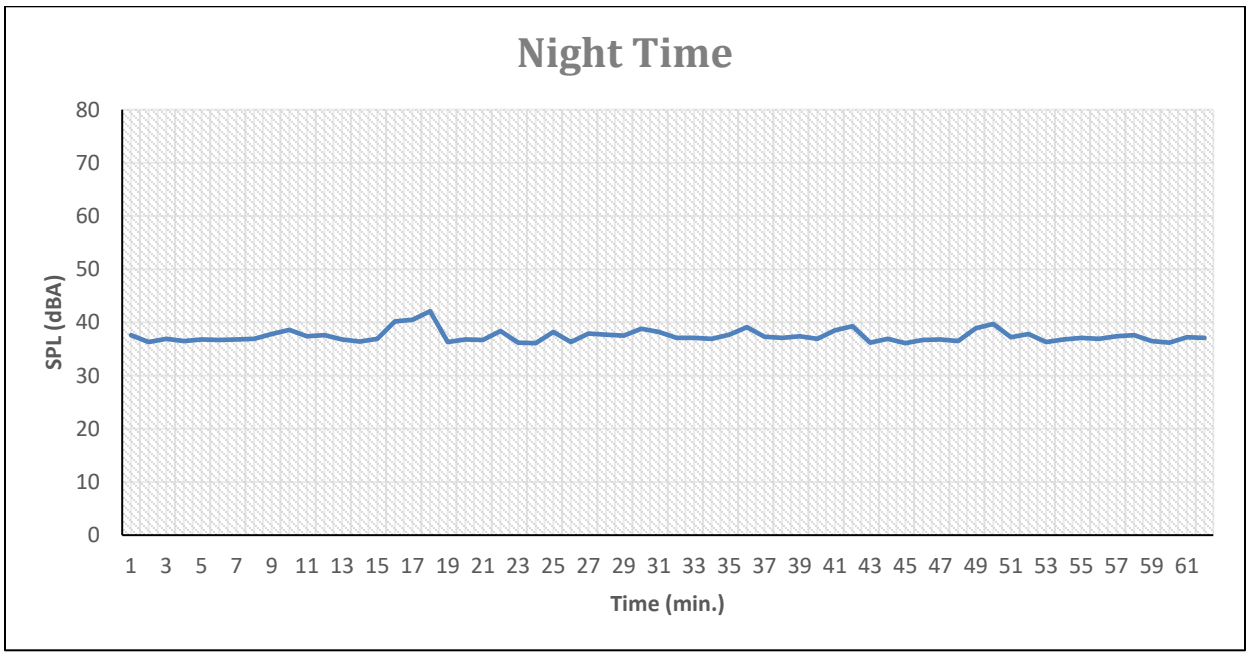
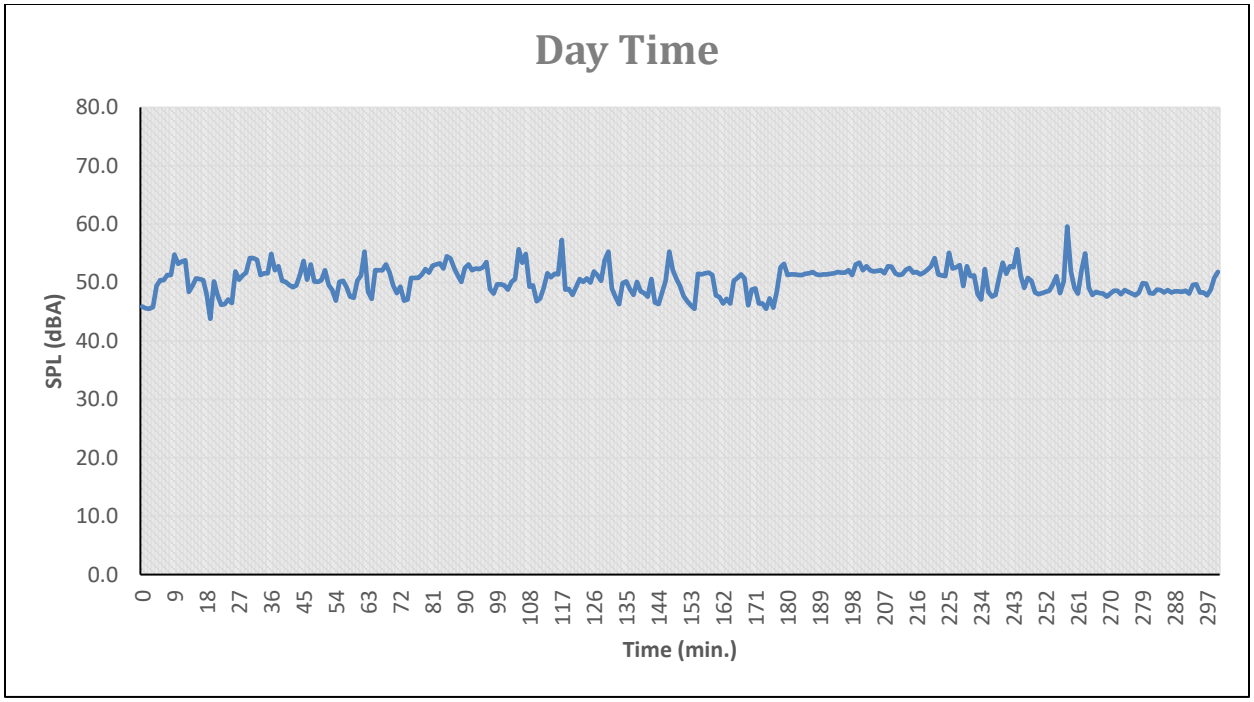


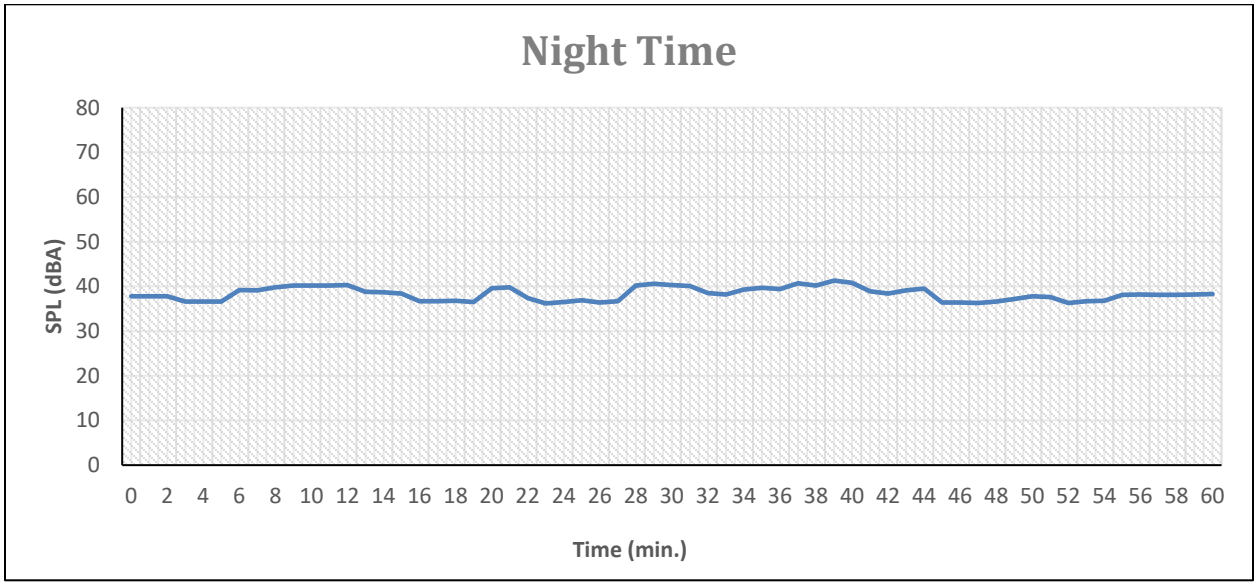
NC1 – Day Hours



NC1 – Night Hours



NC2 – Day Hours



NC2 – Night Hours