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EastMed Pipeline Project

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Abbreviations

Abbreviation	Description
EHS	Environmental, Health, and Safety Guidelines
I.E.C	International Electro technical Committee
IFC	International Finance Corporation
P.D.	Presidential Decree
PPC	Public Power Company

External cooperation

This document was drafted with the cooperation of:

- ACC, Acoustics Consultancy Company

ANNEX 8C.1 BASELINE NOISE STUDY AND PROPAGATION MODEL FOR ATHERINOLAKKOS COMPRESSOR STATIONS

8C.1.1. INTRODUCTION

8C.1.1.1. Scope of Works

For the needs of the Environmental Impact Study of the EASTMED project, a Noise Impact Study, assessing noise level from the operation of the Compressor Stations during the operation phase of the pipeline, is needed.

It was therefore assigned to the company ACC to implement noise propagation models for the acoustic emissions during operation of Compressor Station in Southern Greece D.R.H. Atherinolakkos (CS2 and CS2N).

'D.R.H. Atherinolakkos' Compressor Station (codename CS2/CS2N) will be located in the prefecture of Lasithi in Crete (GGRS87 coordinates: X = 693760, Y = 3875475). The CS2 station and the CS2N will have 100 MW and 75 MW capacity respectively.

The subject of this Acoustic Study is to measure the existing ambient noise in settlements around the location of the 'Atherinolakkos' Compressor Stations and to assess the impact to these settlements from noise emitted from the plant when it will be operating. In this current project design phase the project parameters are specified; hence the assessment will be made by simulating the propagation of the sound emitted during the operation to the nearby settlements of:

- Goudouras, 1.5 km West to the Compressor Station CS2/CS2N
- Ag. Triada, 3.5 km Northeast to the Compressor Station CS2/CS2N

This report presents the baseline noise measurements and the noise maps predicted from the noise propagation model. In detail it includes:

- the findings of the *in-situ* visit;
- the measurements, their processing and assessment of the results;
- the description of the noise propagation model and it's comparative results according to the limits of the legislation and the environmental conditions of the project.

8C.1.1.2. Design team

The design team consists of:

Alexandros Galatas

- Project Manager,
- Civil Engineer, MSc Sound and Vibration studies,
- 18 years of experience,

Iris Riga

- Field surveys
- Electrics and Electronics Engineering, MSc
- 3 years of experience

8C.1.2. SOUND THEORY – DEFINITIONS

8C.1.2.1. Definitions, properties and measurement units of sound

Sound is defined as the mechanical disturbance that propagates with certain speed in a medium that can develop internal forces and has such a character that can stimulate the auditory transducer and cause auditory sense.

The frequency of the sound (f) is the oscillation frequency of the particles of the elastic medium due to the dissipation of the sound wave, which corresponds to the number of repetitions per second and is measured in Hertz (Hz).

In acoustics, the units that are used are usually logarithmic. The main unit of measurement is the decibel (dB). It is a logarithmic unit of measurement of acoustic pressure, tension and power emitted by a sound source.

Instant sound level (Sound Pressure Level) is defined thus as:

$$L_p(t) = 10\log\frac{p^2(t)}{p_0^2} = 20\log\frac{p(t)}{p_0} dB \quad (1)$$

where p(t) is the instantaneous sound pressure and p_0 = 2x10-5 N/m^2 is the reference value.

The dynamic range that can be perceived by an average person is 0-120 dB. Since the dB is a logarithmic unit, a reduction of 6 dB corresponds to half (1/2) the value of the instantaneous sound pressure.

All noise sources cause a time-varying sound level. Therefore, noise cannot be described and evaluated with the use of instant sound level. For this reason, the equivalent continuous sound level or equivalent noise level is used, Leq, which expresses the level of a constant sound source that encompasses the same acoustic energy with the actual sound.

$$Leq = 10\log\frac{\frac{1}{T}\int_0^T p^2 dt}{p_{ref}^2} \qquad (2)$$

where T is the time of observation.

The human ear works in the frequency range from 16 Hz up to 20 kHz but its sensitivity is not the same at all frequencies. Specifically, the human ear is more sensitive to frequencies in the range of 1 000 - 2 000 Hz. For this reason, and in order to adjust the measured noise in the way of the human ear canal, we use frequency-weighting filters. The most common filter is the A-weighting filter.

The sound level resulting from measurements with A-weighting filter is called the A-Weighted sound level and is measured in dB(A). In the majority of cases, the noise measurements (acoustic pressure levels) are made using this filter, by using certified portable devices, called sound level meters. These instruments are fitted with A-weighting filter and the calculation in dB(A) is done automatically.

8C.1.2.2. Sound and its evaluation criteria

Common indices that are used for environmental noise impact assessment are:

- L_{eq} . The energetic average level of the noise during a measurement
- L_{day}. A-weighted long-term mean sound level, calculated for the total 'day' time periods (07:00 – 19:00) of the year
- $L_{evening}$. A-weighted long-term mean sound level, calculated for the total 'evening' time periods (19:00 – 23:00) of the year
- L_{night}. A-weighted long-term mean sound level, calculated for the total 'night' time periods (23:00 – 07:00) of the year
- L_{DEN}. 24hr noise index which is defined from the above indices as:

$$L_{DEN} = 10 \cdot \log_{10}\left(\frac{1}{24}\left(12 \cdot 10^{\frac{L_{day}}{10}} + 4 \cdot 10^{\frac{L_{evening}+5}{10}} + 8 \cdot 10^{\frac{L_{night}+10}{10}}\right)\right)$$

Any non-constant, complex sound, which creates an annoying acoustic impression, is noise. Noise is defined as an unwanted sound, which is unpleasant and usually causes side effects such as: discomfort, difficulty in communication, etc., as well as physical impacts such as hearing loss.

Depending on the way of observation, the noise is divided into the following categories:

Ambient Noise

Ambient noise is the total result of all airborne sounds that are produced from multiple sources, near or far in a given environment, and none of the source is of any interest. ELOT 263.1 (1.209)

Background Noise

Background noise is the noise that comes from all sources that are not related to the specific noise under study. ΕΛΟΤ 263.1 (1.210).

8C.1.3. SPECIFICATIONS – LEGISLATION

Presidential Decree P.D. 1180 (G.P. 293/A/6-10-81) "Regulation of issues relative to the foundation and operation of industries, all kinds of mechanical facilities and storage areas for environmental protection".

The Presidential Decree P.D. 1180, defines the allowed noise limits that are emitted to the environment during the operation of the facilities, measured over the border of the estate in which the facility operates.

Regarding legislated industry areas, the maximum noise limit is up to 70 dB(A). In areas where a number of industries are located, the maximum noise level is up to 65 dB(A). In areas where industries and residencies are equally shared, maximum noise level is up to 55 dB(A). In areas where residencies prevail, maximum noise level is up to 50 dB(A).

In the area of the project, the limit is 65 dB(A).

According to IFC (International Finance Corporation) General EHS Guidelines regarding Noise Management (§ 1.7), noise impacts from the installation should not exceed 55 dB(A) for Daytime (07:00 - 22:00), 45 dB(A) for Nighttime (22:00 - 07:00) or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site

8C.1.4. AMBIENT NOISE MEASUREMENTS

For the evaluation of the acoustic environment the noise measurements are performed in accordance with the ISO 1996-1:2016 and ISO 1996-2:2017 standards.

8C.1.4.1. Equipment

The acoustic measurements were undertaken with the following equipment:

Integrating Sound level meter:

Cirrus CR:8011A Sound analysers (B19372FD, B19378FD), precision Class 1, with real time filters 1/1- and 1/3-octave and spectral weighting networks A, C and Flat

Precision sound calibrators:

Calibrator Cirrus CR:511 S/N 43633, precision Class 1

The sound analysers are precision Class 1, that corresponds to the technical specifications contained in the Publications 61672-1:2003 of the International Electro technical Committee (I.E.C. Publications 61672-1:2002) as well as the ΕΛΟΤ EN 61672.01.

8C.1.4.2. Measurement procedure

The measurements were conducted from Wednesday, 10.03.2021 till Thursday, 11.03.2021. In each case calibration was performed on the spot, before starting the measurements and at the end of the measurement as required by the standard measurement procedure ISO 1996-1:2016 and ISO 1996-2:2017 and for indicating that the sensitivity of the instruments remained stable during the measurements. The sound measurements were made with a time circuit (F) Fast and A-weighting frequency filter while third 1/3-octave band spectral analysis. Location of the measurements is presented in Table C1-1 and Figure C1- 1.

Table C1-1 Location and GPS Coordinates of the Measurements

Position	Start	End	GGRS87 X	GGRS87 Y
N_01 Goudouras	10/3/21 11:45	11/3/21 11:45	691226.81	3875954.18
N_02 Agia Triada	10/3/21 12:52	11/3/21 12:52	694606.95	3879220.46
N_03 Site	10/3/21 10:31	11/3/21 10:31	694480.27	3875010.08

Prepared by ACC on behalf ASPROFOS, 2022.

8C.1.4.3. Measurement results

A summary table of the measurement results is reported below:

Table C1-2 Measurement Results

Position	L_{day}	$L_{evening}$	L_{night}	L_{DEN}	L_{eq}	L_{95}
N_01 Goudouras	57.9	50.9	52.3	59.7	55.8	33.0
N_02 Agia Triada	57.0	51.2	48.2	57.3	54.7	31.2
N-03 Site	56.3	50.2	49.0	57.3	54.3	43.8

Prepared by ACC on behalf ASPROFOS, 2022.

Details of the measurements are provided at Appendix 2 - DETAILED MEASUREMENT RESULTSwhich is attached at the end of the report.

In all settlements the sound level meters were placed close to the centre of each settlement and thus exposed to the road traffic noise of the main road of each settlement. The road traffic noise were the major noise sources in all cases. Houses further away from the main road would be exposed up to 10 dB less noise. The L_{95} index is a representative value for the noise level at all houses in the settlement when there is no traffic circulation.NOISE PROPAGATION MODEL

8C.1.5. NOISE PROPAGATION MODEL

8C.1.5.1. Noise propagation software

The acoustic study was implemented with the use of specialized software for the noise prediction and noise mapping, which is in accordance to the requirements of the directive 2002/49/EC.

The software used is `IMMI 2020 Premium` of the German Company `Woelfel Meβsysteme GmbH`. The consultancy team has in its possession the license IMMI 2020 Premium S72/354.

The calculations of the noise propagation was conducted based on the international standard ISO 9613-2:1996 (Acoustics -- Attenuation of sound during propagation outdoors) and in accordance to the ISO/TR 17534-3:2015 (Acoustics -- Software for the calculation of sound outdoors).

All the calculations correspond to the A-weighted equivalent sound level index ($L_{A,eq}$ measured in dB(A)).

8C.1.5.2. Noise Propagation Simulation

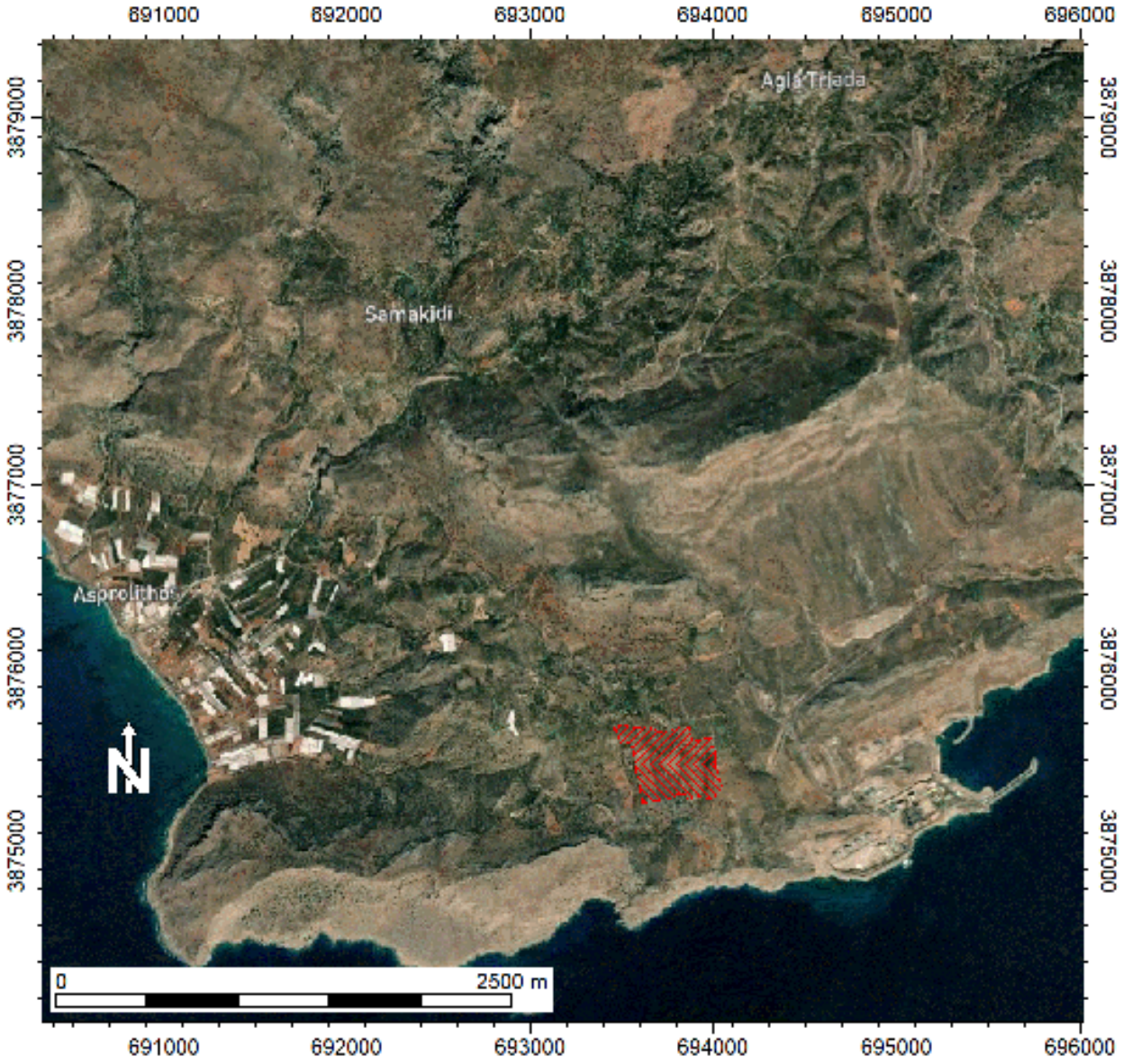
The input parameters are displayed in the Table C1-3with the respective assumptions. Based on this data, a 3-D model for the noise propagation was made (Figure C1- 1), in order to produce a noise map of the area.

The model was calibrated using the noise field measurements. The noise sources from the Compression Station are modeled as one area source which results to noise level not more than 65 dB(A) at the borders of the plant, as this is a requirement by the Law (see page 10 of this report, section 8C.1.3 - SPECIFICATIONS – LEGISLATION) and the environmental terms of the project.

Table C1-3 Input data and assumptions for the sound dissipation 3D model

No	INPUT DATA	ASSUMPTIONS - VALUES
1	Topography: Primary and secondary contour lines and altitude points	Contours in project area Rest of study area: from the SRTM (NASA) database X – Y coordinates of settlements: from satellite pictures (assumption)
2	Buildings – obstacles	No buildings or other objects were taken in consideration
3	Ground– Sound Absorption	Average ground and sea sound absorption A = 0.5 (assumption)
4	Noise Sources – traffic noise	For the cumulative model, the traffic noise was taken into account at the measurement positions basing on the sound level measurements
5	Noise Sources – sound level from plant	Noise source area inside the plant that was calibrated to give 65 dB(A) at the border of the plant
6	Noise Propagation – wind direction	Downwind propagation (worst case scenario)
7	Noise Propagation – meteorological conditions	Temperature 25°C, Humidity 60%
8	Calculations – order of reflections	3
9	Control Criteria	A-weighted Leq

Prepared by ACC on behalf ASPROFOS, 2022.



Prepared by ACC on behalf ASPROFOS, 2022.

Figure C1- 1 Overview of the investigated area modeled in IMMI

8C.1.5.3. Model Results

The resulting noise levels at the four locations around 'D.R.H. Atherinolakkos' Compressor Stations are summarized in the table below:

Table C1 4 Summary results from 3D noise emission model

Position	Prediction with Station in operation	Baseline measurements (see page 11 and Appendix 2 - DETAILED MEASUREMENT RESULTS)			Cumulative model (prediction + baseline)		
	L_{eq}	L_{night}	L_{eq}	L_{95}	L_{night}	L_{eq}	L_{95}
N_01 Goudouras	16.0	52.3	55.8	33.0	52.3	55.8	33.0
N_02 Ag. Triada	6.2	48.2	54.7	31.2	54.7	54.7	31.2
N_03 Site	65.00	49.0	54.3	43.8	65.4	65.4	65.0

Prepared by ACC on behalf ASPROFOS, 2022.

It is evident that due to distance and terrain attenuation, the noise level is lower than IFC limits (55 dB(A) Daytime, 45 dB(A) Nighttime) and also lower than the values that were measured during the measurement survey in March 2021. The highest noise level is expected in 'Goudouras' settlement, at 16.0 dB(A), where L_{eq} = 55.8 dB(A) for the average ambient noise level and 52.3 dB(A) during the night.

Detailed noise maps are presented in Appendix 1 - NOISE MAPS

8C.1.6. CONCLUSIONS

- From the acoustic measurements made by specialist acoustic consultants, the ambient noise in the centers of the settlements near the proposed site for the construction of the 'Atherinolakkos' Compressor Stations is in the L_{DEN} = 55 – 60 dB(A) zone. The main noise source is the traffic noise from vehicles crossing the main road of each settlement. During nighttime the noise levels are in the L_{night} = 45 – 55 dB(A) zones.
- The noise currently at the proposed site location is in the 55 – 60 dB(A) zone due to the noise from the adjacent factory from Public Power Company (PPC).
- According to sound dissipation calculations that were performed using a computer 3-D model of an area about 3km around the site, the noise impact to the nearby settlements from the operation of 'Atherinolakkos' Compressor Stations will be compliant with the imposed specifications for environmental noise, assuming that all the necessary measures will be taken

so that the Compressor Stations will comply with the limit of emitting noise levels no more than 65 dB(A) at the plant's border, which is implied by the Law and the environmental terms of the project.

On behalf of

Acoustics Consultancy Company

Alexandros Galatas

Civil Engineer

MSc & Vibration Studies

Appendix 1 NOISE MAPS

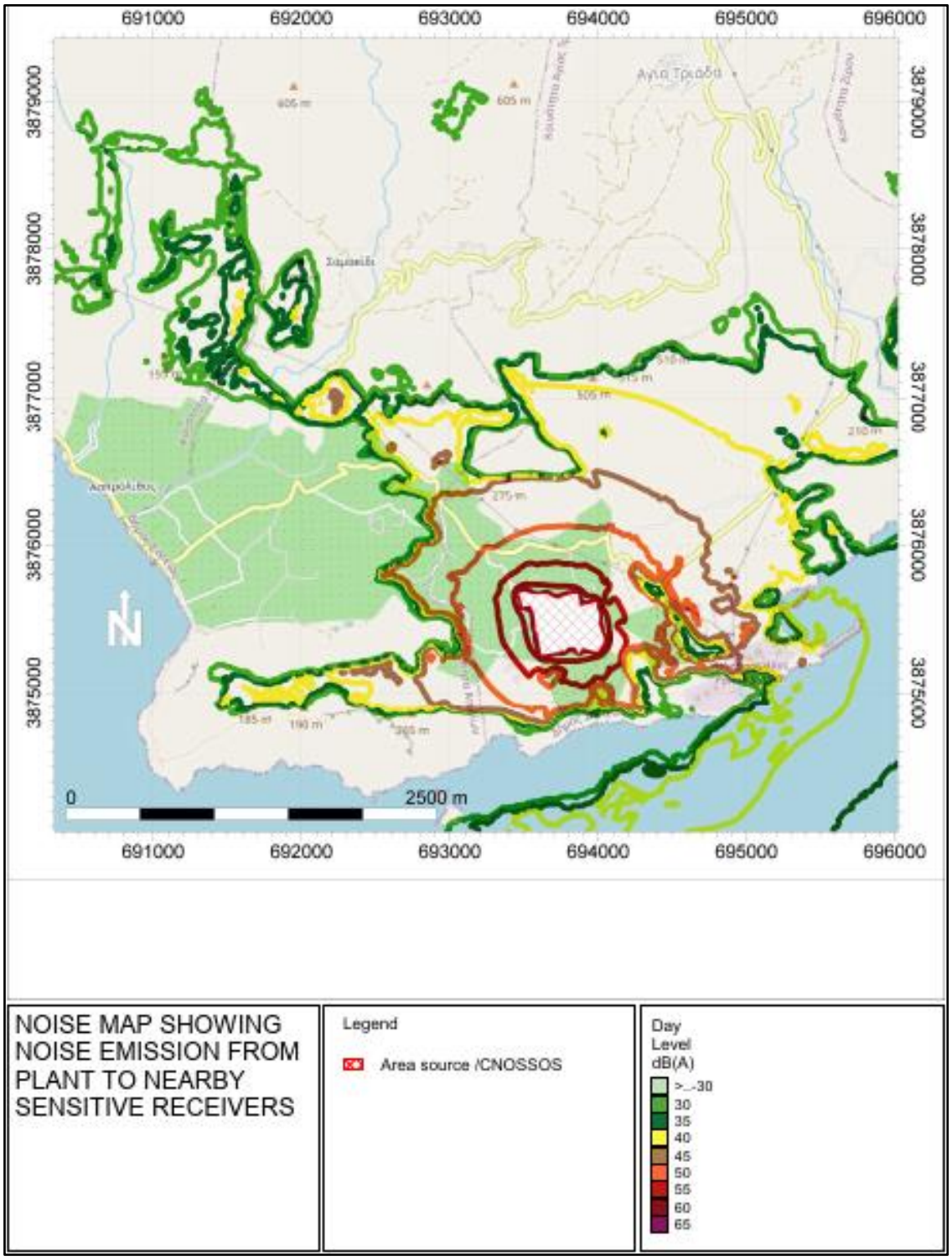
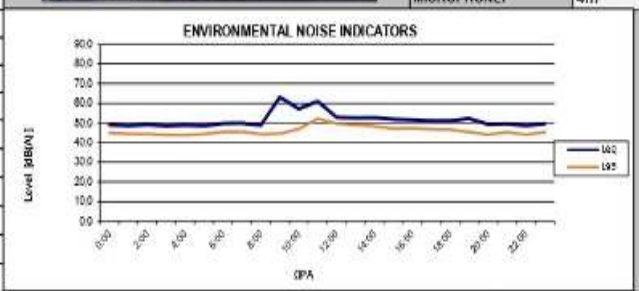


Figure 1 Noise Map Showing Noise Emission From Plant to Nearby Sensitive Receiver

Appendix 2 DETAILED MEASUREMENT RESULTS

Table 1 Environmental Noise 24h Measurements (OSS2-CS2-D.R.H Atherinolakkos)

			PROJECT:	EAST MED							
			SUBJECT :	ENVIROMENTAL NOISE 24h MEASUREMENTS							
POSITION:		OSS2 - CS2 - D.R.H. Atherinolakos		DRAWING				PICTURE			
DESCRIPTION:		Noise Measurements									
OPERATOR:		Iris Riga						POSITION / HEIGHT MICROPHONE:	4m		
DATE:		10.03.21									
START TIME:		10.31									
DURATION:		24h									
INSTRUMENT TYPE:		CR:800									
CALIBRATION [✓]	INITIAL LEVEL:	93,7 dB(A)									
	FINAL LEVEL:	93,7 dB(A)									
TEMPERATURE:		13,7 -22,2°C									
HUMIDITY:		68 - 75%									
WIND	SPEED:	8,8 km/h									
	ORIENTATION:	NE									
STORING IN PC:		✓									
METPOYMENH TIMH dB(A)	Leq 24h	54,1									
	L10 18h	54,0									
	Lday 07:00 19:00	56,3									
	Leven. 19:00 23:00	50,2									
	Lnight 23:00 07:00	49,0									
	Lden	57,3									



ΑΠΟ	ΕΩΣ	Leq	L10		LAFmax	L1	L50	L90	L95	L99
0:00	1:00	49,1	51,3		62,0	54,1	48,3	45,6	44,9	43,6
1:00	2:00	48,5	50,8		60,0	53,6	47,7	45,0	44,3	43,1
2:00	3:00	49,2	51,7		59,8	54,6	48,3	45,2	44,4	42,9
3:00	4:00	48,4	50,8		60,9	53,9	47,5	44,7	43,9	42,7
4:00	5:00	48,8	51,4		61,2	54,6	47,8	44,7	43,8	42,3
5:00	6:00	48,5	50,9		61,1	53,6	47,8	45,1	44,4	43,2
6:00	7:00	49,8	52,0		59,5	55,1	48,9	46,1	45,4	44,0
7:00	8:00	49,9	52,1		60,8	55,0	49,1	46,3	45,5	44,3
8:00	9:00	48,9	51,2		60,2	54,1	48,2	45,1	44,2	42,2
9:00	10:00	63,1	51,8		92,4	65,1	48,3	45,3	44,5	43,2
10:00	11:00	57,1	60,9		74,4	66,2	53,4	47,9	46,9	45,2
11:00	12:00	61,0	64,5		77,9	70,1	57,7	53,1	52,2	50,7
12:00	13:00	52,9	54,9		63,8	57,4	52,3	50,2	49,7	48,8
13:00	14:00	52,5	54,6		60,9	57,1	51,9	49,7	49,1	48,2
14:00	15:00	52,6	54,9		70,8	57,3	51,8	49,0	48,3	47,0
15:00	16:00	51,8	54,2		62,4	57,0	51,0	47,8	47,1	45,9
16:00	17:00	51,6	54,0		62,9	57,0	50,7	47,9	47,3	46,0
17:00	18:00	51,2	53,5		63,9	56,6	50,4	47,6	46,8	45,6
18:00	19:00	51,1	53,4		63,3	56,4	50,1	47,2	46,5	45,3
19:00	20:00	52,2	53,3		81,2	58,9	49,8	46,4	45,4	43,1
20:00	21:00	49,3	51,7		61,4	55,3	48,2	44,9	44,0	42,4
21:00	22:00	49,6	51,9		61,1	54,8	48,8	46,0	45,3	43,9
22:00	23:00	48,6	51,0		62,5	54,3	47,7	44,7	44,0	42,8
23:00	0:00	49,6	51,9		60,3	54,6	48,8	46,1	45,3	43,9
REMARKS:										

Table 2 Environmental Noise 24h Measurements (Goudouras)

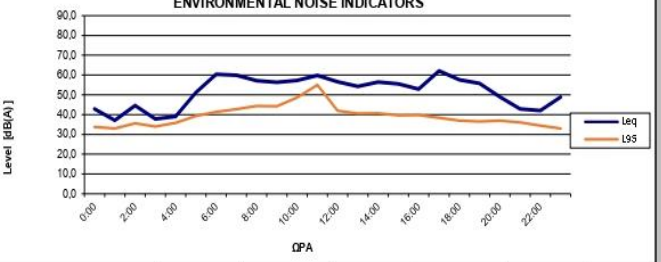
acc Acoustics Consultancy Company		PROJECT:	EAST MED
		SUBJECT :	ENVIROMENTAL NOISE 24h MEASUREMENTS
POSITION:	Goudouras		
DESCRIPTION:	Noise Measurements		
OPERATOR:	Iris Riga		
DATE:	10.03.21		
START TIME:	11:45		
DURATION:	24h		
INSTRUMENT TYPE:	CR:800		
CALIBRATION [✓]	INITIAL LEVEL:	93,7 dB(A)	
	FINAL LEVEL:	93,7 dB(A)	
TEMPERATURE:	13,7 -20,6°C		
HUMIDITY:	68-87%		
WIND	SPEED:	8,8 km/h	
	ORIENTATION:	NE	
STORING IN PC:		✓	
METPOYMENH TIMH dB(A)	Leq 24h	55,8	
	L10 18h	53,2	
	Lday 07:00 19:00	57,9	
	Leven. 19:00 23:00	50,9	
	Lnight 23:00 07:00	52,3	
	Lden	59,7	

DRAWING

PICTURE

POSITION / HEIGHT MICROPHONE: 4m

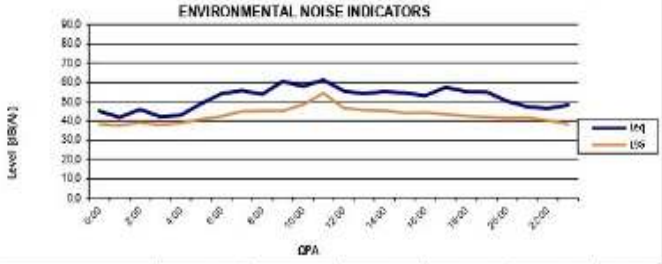
ENVIRONMENTAL NOISE INDICATORS



ΑΠΟ	ΕΩΣ	Leq	L10	LAFmax	L1	L50	L90	L95	L99
0:00	1:00	42,8	39,8	73,8	43,4	36,8	34,2	33,7	33,0
1:00	2:00	37,1	39,4	56,3	43,5	36,1	33,5	33,0	32,1
2:00	3:00	44,6	42,0	75,7	47,6	38,5	36,1	35,6	34,5
3:00	4:00	37,8	40,0	58,9	43,5	36,6	34,4	34,0	33,3
4:00	5:00	39,1	41,3	49,4	44,1	38,4	36,3	35,8	34,9
5:00	6:00	51,2	47,9	76,8	61,3	43,7	40,3	39,3	37,7
6:00	7:00	60,4	57,7	89,9	71,4	48,4	42,5	41,3	39,8
7:00	8:00	59,9	63,1	85,4	70,2	47,3	43,4	42,7	41,7
8:00	9:00	57,1	56,4	82,2	69,9	47,8	45,1	44,4	43,3
9:00	10:00	56,3	56,7	78,5	69,1	47,8	44,9	44,2	43,1
10:00	11:00	57,3	59,5	74,5	68,5	54,3	49,4	48,6	47,4
11:00	12:00	59,8	61,0	79,6	70,0	57,2	55,4	55,0	54,3
12:00	13:00	56,6	57,2	86,6	68,6	47,2	42,6	41,9	40,8
13:00	14:00	54,3	53,8	78,5	67,4	44,7	41,3	40,5	38,6
14:00	15:00	56,5	53,9	88,2	67,0	45,7	41,8	40,7	39,4
15:00	16:00	55,5	55,0	85,3	68,2	43,6	40,2	39,6	38,7
16:00	17:00	52,9	52,9	77,2	66,1	43,2	40,3	39,7	38,8
17:00	18:00	62,1	59,0	96,4	68,7	47,4	39,3	38,4	37,1
18:00	19:00	57,6	56,0	88,6	68,7	42,2	37,6	37,0	36,3
19:00	20:00	55,8	51,0	86,2	67,3	39,3	37,0	36,5	35,7
20:00	21:00	49,0	44,7	74,5	60,0	39,4	37,3	37,0	36,3
21:00	22:00	42,9	41,9	74,2	47,5	38,6	36,6	36,0	35,0
22:00	23:00	42,1	39,8	71,6	45,6	37,3	35,2	34,4	33,4
23:00	0:00	48,9	38,3	82,8	47,6	36,0	33,5	33,0	32,0

REMARKS:

Table 3 Environmental Noise 24h Measurements (Agia Triada)

			PROJECT:	EAST MED							
			SUBJECT :	ENVIROMENTAL NOISE 24h MEASUREMENTS							
POSITION:		Agia Triada		DRAWING				PICTURE			
DESCRIPTION:		Noise Measurements						N/A			
OPERATOR:		Iris Riga									
DATE:		10.03.21									
START TIME:		12:52									
DURATION:		24h									
INSTRUMENT TYPE:		CR:800									
CALIBRATION [✓]	INITIAL LEVEL:	93,7 dB(A)						POSITION / HEIGHT MICROPHONE:		4m	
	FINAL LEVEL:	93,7 dB(A)									
TEMPERATURE:		13,7 -20,6°C									
HUMIDITY:		68-87%		ENVIRONMENTAL NOISE INDICATORS							
WIND	SPEED:	8,8 km/h									
	ORIENTATION:	NE									
STORING IN PC:		✓									
METPOYMENH TIMH dB(A)	Leq 24h	54,7									
	L10 18h	54,3									
	Lday 07:00 19:00	57,0									
	Leven. 19:00 23:00	51,2									
	Lnight 23:00 07:00	48,2									
	Lden	57,3									

ΑΠΟ	ΕΩΣ	Leq	L10	LAFmax	L1	L50	L90	L95	L99
0:00	1:00	45,0	44,6	67,0	47,8	41,6	39,0	38,4	37,4
1:00	2:00	41,9	44,2	57,2	47,6	41,0	38,3	37,7	36,7
2:00	3:00	46,0	45,9	66,8	50,2	42,5	39,7	39,1	37,8
3:00	4:00	42,2	44,5	59,0	47,8	41,1	38,6	38,0	37,1
4:00	5:00	43,0	45,4	54,4	48,4	42,2	39,6	38,9	37,7
5:00	6:00	48,9	48,5	68,0	56,5	44,8	41,8	40,9	39,5
6:00	7:00	54,2	53,9	73,8	62,3	47,7	43,4	42,4	41,0
7:00	8:00	55,7	58,4	73,9	63,4	49,0	45,7	44,9	43,8
8:00	9:00	53,8	54,6	72,0	62,8	48,8	45,9	45,1	43,6
9:00	10:00	60,5	55,1	86,3	67,9	48,9	45,9	45,2	44,0
10:00	11:00	58,0	61,0	75,3	68,2	54,7	49,5	48,6	47,1
11:00	12:00	61,2	63,6	79,6	70,9	58,3	55,1	54,4	53,3
12:00	13:00	55,6	56,9	76,0	63,8	50,6	47,2	46,6	45,6
13:00	14:00	54,2	55,0	70,5	63,1	49,1	46,3	45,6	44,2
14:00	15:00	55,4	55,2	80,3	63,0	49,6	46,2	45,3	44,0
15:00	16:00	54,5	55,4	74,7	63,4	48,1	44,8	44,2	43,1
16:00	17:00	53,1	54,3	70,9	62,4	47,8	44,9	44,3	43,2
17:00	18:00	57,5	57,1	81,0	63,5	49,7	44,3	43,4	42,2
18:00	19:00	55,2	55,5	76,8	63,4	47,0	43,2	42,6	41,6
19:00	20:00	55,1	53,2	84,8	64,2	45,6	42,8	42,0	40,5
20:00	21:00	50,2	49,3	69,0	58,7	44,9	42,2	41,6	40,4
21:00	22:00	47,3	48,0	68,7	52,2	44,8	42,4	41,7	40,5
22:00	23:00	46,4	46,5	68,1	51,0	43,6	41,0	40,3	39,2
23:00	0:00	48,3	44,2	70,6	50,2	41,5	38,9	38,2	37,0
REMARKS:									