

ENVIRONMENTAL BULLETIN OF THESSALONIKI “MAKEDONIA” AIRPORT (SKG)

Reference year 2021

Fraport Regional Airports of Greece A S.A.

Issue year: 2022

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1. INTRODUCTION

1.1. Location

“Makedonia” airport of Thessaloniki (SKG) is located in the coastal area of Mikra, to the south east, and at a distance of 16 Km from the centre of the city of Thessaloniki. It is 2 km away from the old National Road Thessaloniki - Chalkidiki, in the broader area that is known as “Livadi”. The airport occupies approximately 1408 acres (5,700 stremmas) and is surrounded to the north-east by the Anthemoundas stream, to the south - south east by the National Road Thessaloniki - Michaniona, to the west - south west by areas of rural and semi-urban use and finally to the north - north west by the sea.

1.2. Administration

The airport administratively belongs to the Municipality of Thermi of the Regional Unit of Thessaloniki and more specifically to the community of Neo Rysio of the Department of Thessaloniki.

1.3. Environmental licensing

Approved Environmental Terms	
E.T. Decision Reference number	105214/17.11.2000
E.T. Amendment Decision Reference Number	125887/08.05.2007
	204012/05.10.2011
	12763/10.03.2016
	9322/9.05.2018
	80002/5297/30.08.2021

1.4. Airport Basic Data

Airport name IATA / ICAO	SKG / LGTS
Airport location – Airport Reference Point (ARP)	Latitude: 40° 31' 11" N Longitude: 22° 58' 15" E
Altitude	7m
Number of runways	2
Operation hours (summer & winter)	0:01-24:00

Runways	Length/Width			Code	
Runway	3,440 m x 50 m			10/28	
Runway	2,410 m x 60 m			16/34	
Full length of parallel taxiway	(ALPHA) 2,410 m, (FOXTROT) 2,440 m				
Number of taxiways	12				
Apron capacity	A	B	C	D	E
	-	-	16	2	1

Employees	High season (31.08.2021)	Low season (30.11.2021)
Fraport Greece (FG) employees	80	81
Employees of other companies	3.011	2.899

Terminal	
➤ Total area (m ²)	60.680

Other buildings and service/storage areas	
➤ RFF Station (m ²)	1.470

Parking Areas	
Car parking spaces	2.062
Bus parking spaces	107
Taxi parking spaces	185

1.5. Airport facilities

1.5.1. Fuel Handlers

Number of fuel handler companies	
Number of fuel handler companies operating at the Airport	3

Installations inside the airport	EKO	GISSCO	HAFCO
Environmental Management System (EMS)	YES	YES	YES

1.5.2. Ground Handlers

Number of ground handler companies	
Number of ground handler companies operating at the Airport	3

Installations inside the airport	SKYSERV	SWISSPORT	GOLDAIR
Environmental Management System (EMS)	YES	YES	YES

2. TRAFFIC DATA STATISTICS

2.1. Annual Traffic Data

Annual Traffic Data for the year 2021	
Overall Annual Air Traffic Movements ¹	37.225
Percent of increase or decrease in relation to the previous year	49,1 %
Annual passenger traffic	3.449.658
Percent of increase or decrease in relation to the previous year	48,9 %
Annual cargo transferred (tn)	4.386
Percent of increase or decrease in relation to the previous year	10,4%

Aircraft types	
Prevailing aircraft types for domestic flights	
Aircraft type	No. of flights
A20N	5.926
A320	2.420
DH8D	2.224
A32A	830
AT75	667
B73H	513
AT72	490
E120	450
PA2	234
AT76	220
Other	1.917
Prevailing aircraft types for international flights	
Aircraft type	No. of flights
A320	4.776
B73H	4.095
B738	2.137
A32A	1.978
A319	1.202
A20N	897
A321	780
A21N	486
7M8	443
C56X	427
Other	4.113

¹ Military and training flights not included.

2.2. High season traffic data

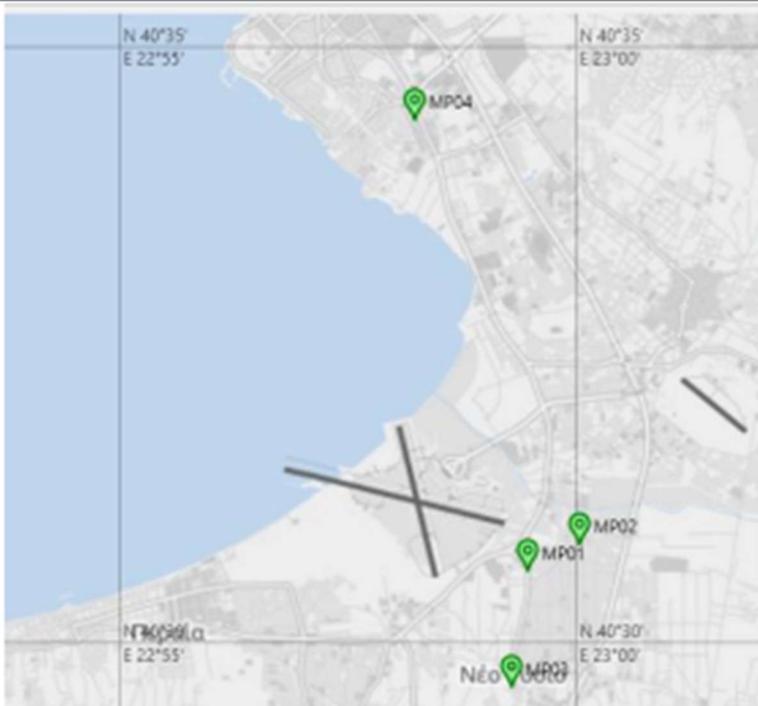
High season traffic data (June-September)	
Highest traffic month	August
Air traffic movements during the month with highest traffic	5.946
Air traffic movements daily average number during the month with highest traffic	192

2.3. Low season traffic data

Low season traffic data (October-May)	
Lowest traffic month	February
Air traffic movements during the month with lowest traffic	929
Air traffic movements daily average number during the month with lowest traffic	33

3. AIRCRAFT NOISE

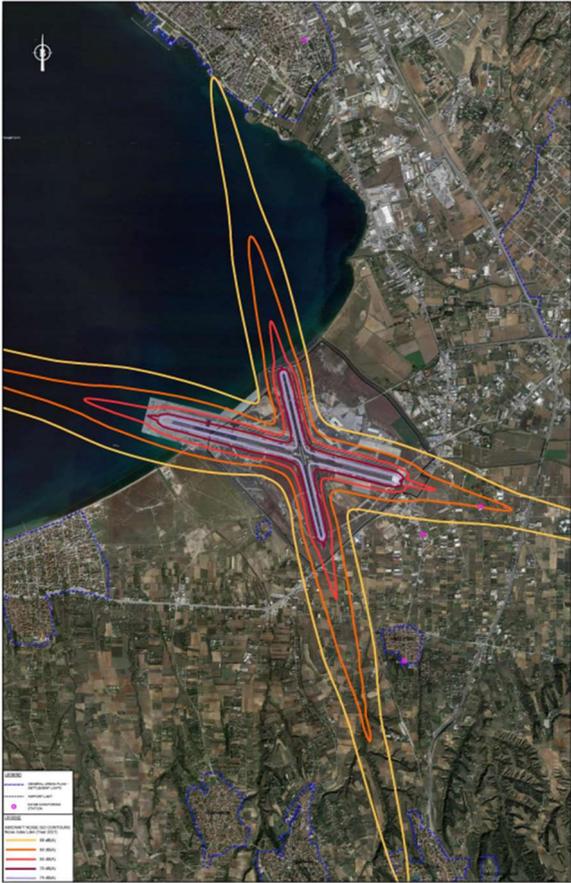
3.1. Noise measurements during the reference year

Have noise measurements at the airport's surrounding area been performed during the reference year?		YES
Noise Monitoring Stations		
		
Measurement points coordinates	Measurement points description	
MP01: 40° 30' 35.51" N 22° 59' 27.86" E	Gym Hall Neo Rysio area	
MP02: 40° 31' 34.40" N 22° 59' 45.10" E	Parking Apollo	
MP02: 40° 51' 54.10" N 23° 00' 5.48" E	Skafotechniki (since 03.11.2021)	
MP03: 40° 29' 37.10" N 22° 59' 17.32" E	Cultural center Neo Rysio area	
MP04: 40° 34' 22.18" N 22° 58' 13.57" E	Cleaning building Municipality Kalamaria	
Measurement period	01.03.2021 – 31.12.2021	
Noise indicators	L _{den} , L _{night}	

Summary of measurement results:

Noise levels are monitored according to the airport's monitoring program.
 No exceedance of the noise indicators levels L_{den}=70 dB (A) and L_{night}=60 dB (A) was observed.
 MP01: L_{den}=51,9 dB(A) & L_{night}=41,6 dB(A)
 MP02 (Apollo Parking): L_{den}=45,3 dB(A) & L_{night}=37,1 dB(A)
 MP02 (Σκαφοτεχνική): L_{den}=56,3 dB(A) & L_{night}=43,6 dB(A)
 MP03: L_{den}=47,3 dB(A) & L_{night}=37,4 dB(A)
 MP04: L_{den}=27,3 dB(A) & L_{night}=10 dB(A)

3.2. Noise levels calculation based on noise simulation software

Aircraft noise levels calculation based on noise simulation software	YES
Software used: IMMI Noise Prediction Software (CNOSSOS EU assessment method based on Directive 2015/996/EU)	
Noise indicators and respective contours calculation: L_{den} , L_{night}	
Noise contours:	
 <p style="text-align: center;">L_{den}</p>	 <p style="text-align: center;">L_{night}</p>

Summary of results:

For the year 2021 no population or buildings within official settlement boundaries were found to be exposed to noise levels higher than the limits $L_{den}=70$ dB(A) and $L_{night}=60$ dB(A).

3.3. Vibration measurements during the reference year

Πραγματοποιήθηκαν μετρήσεις δονήσεων στην περιοχή πέριξ του αεροδρομίου για το έτος αναφοράς;	YES
Measurement points	



Measurement points coordinates	Measurement points description
Position 1	Archaeological site "Toumba Livadaki". It is located in the south of the Airport and east of runway 16-34.
Measurement period	05.10.2021 – 11.10.2021
Indicators	V_v

Summary of measurement results:

The values are considering the aircraft landings and takeoffs on runway 16–34 because these processes cause the greatest impact on the archaeological site. The maximum value due to takeoff is 0.37 mm/sec at 16.5 Hz and 2.68 mm/sec at 63 Hz. For landings, the maximum value is 0.43 mm/sec at 16.5 Hz and 0.28 mm/sec at 63 Hz. These values are considerably lower than the regulatory limits of 6 mm/sec and 8 mm/sec, respectively.

4. AIR QUALITY

4.1. Air quality measurements during the reference year

Have air quality measurements at the airport's surrounding area been performed during the reference year?		YES
Measurement points		
		
Measurement points	Measurement points description	
Position: 40° 30' 35.7" N 22° 59' 28" E	Gym Hall Neo Rysio area	
Measurement period:	01.03.2021-31.12.2021	
Pollutants measured:	PM ₁₀ , PM _{2,5} , NO ₂ , SO ₂ , C ₆ H ₆ , O ₃	
Summary of measurement results:		
Air quality is monitored according to the airport's monitoring program. No exceedance of the air quality limits was observed.		

4.2. Air pollutants emission and dispersion modelling

Calculation of air pollutants concentrations based on an emission and dispersion modelling software		NO*
Software used: N/A		
Pollutants concentrations and respective contours calculation: N/A		
PM ₁₀		N/A
NO _x		N/A
SO _x		N/A
Benzene (C ₆ H ₆)		N/A

Summary of results:

*Fraport Greece, during the years 2018-2019, has implemented a noise & air pollution monitoring program, according to the Approved Environmental Terms of the airport. The monitoring program included the implementation of special simulation tools in combination with confirmation measurements, of air pollution and noise, in representative positions around the airport. At the end of the two year period of the program in April 2020, in implementation of the Environmental Terms, a Technical Evaluation Report was submitted to the Directorate for Climate Change and Air Pollution of the Ministry for Environment & Energy, with proposals for the most suitable in terms of effectiveness, air pollution & noise monitoring program for the years ahead (ref. number 39833/833/29.4.2020).
According to the program, which is also an appendix in approved Environmental Impact Study, in 2021 the air pollution simulation was not foreseen.

5. WASTE MANAGEMENT

Waste	Collection	Management/Disposal
Recyclables (paper, plastic, metals, glass)	Separate collection by the Municipality of Thermi	Disposal at material recovery facility or transshipment for recycling
Residues (Mixed Waste) and Bulky Waste	Collection by the Municipality of Thermi	Disposal in landfill

Notes:

1. Regarding the different categories of the MSW (recyclables, mixed waste, bulky waste), the Airport Users handle their waste together with Fraport Greece A in most cases (central management), while in a few other cases they handled them autonomously. The implementation of a fully central system by Fraport Greece A is expected.
2. Regarding the “alternative management” waste categories (Waste lubricant oil WLO, WEEE, etc.):
 - i. Waste Lubricant Oil (WLO): Collection and management by authorized collector “CYTOP S.A.”
 - ii. Waste Electrical & Electronic Equipment (WEEE): Collection and management by alternative management system “Appliances Recycling S.A.”
 - iii. Accumulators: Collection and management by alternative management system “Re-Battery S.A.”
 - iv. Small batteries: Collection and management by alternative management system “AFIS S.A.”
 - v. Used tires: Collection and management by alternative management system “ECOELASTIKA S.A.”
3. The total quantities of the hazardous waste further to the above-mentioned and produced at the airport, are managed by licensed private companies which have a contract with Fraport Greece A, according to the provisions of the legislation in force.
4. The total quantities of the produced waste by category resulting from all activities of the airport, the collectors and final recipients, are recorded by Fraport Greece A and submitted in the Electronic Waste Registry of the Ministry for Environment and Energy via the Annual Waste Producer Report according to the provisions of the legislation in force.

6. ECOSYSTEM AROUND THE AIRPORT

6.1. Flora-Fauna

Flora	
Are there protected zones of vegetation/habitats in the broader airport area?	NO
<i>(if YES)</i> Short description:	
Fauna	
Are there protected species of fauna/birds in the broader airport area?	YES
<i>(if YES)</i> Short description: The protected bird species that have been observed at Thessaloniki airport since April 2017 are presented below: <i>Black-crowned night heron (Nycticorax nycticorax), Black stork (Ciconia nigra), Collared pratincole (Glareola pratincola), Eurasian bittern (Botaurus stellaris), Eurasian curlew (Numenius arquata), Eurasian stone-curlew (Burhinus oedichnemos), Eurasian skylark (Alauda arvensis), European kingfisher (Alcedo atthis), European roller (Coracias garrulous), European turtle-dove (Streptopelia turtur), Gadwall (Anas strepera), Garganey (Anas querquedula), Glossy ibis (Plegadis falcinellus), Great egret (Casmerodius albus), Grey partridge (Perdix perdix), Lapwing (Vanellus vanellus), Lesser grey shrike (Lanius minor), Lesser kestrel (Falco naumanni), Little tern (Sterna albifrons), Marsh harrier (Circus aeruginosus), Mediterranean gull (Larus melanocephalus), Montagu’s harrier (Circus pygargus), Purple heron (Ardea purpurea), Red-footed falcon (Falco vespertinus), Shelduck (Tadorna tadorna), Short-toed snake eagle (Circaetus gallicus), Slender billed gull (Larus genei), White stork (Ciconia ciconia)</i>	

6.2. Ecologically fragile areas

The nearest protected area is the “Lagoon of Aggeloxhori” at a distance of approximately 12km from the airport.

7. WILDLIFE HAZARD MANAGEMENT

Wildlife strikes and wildlife hazard management measures	
Wildlife species that suffered a strike	Strikes (%)
Common kestrel (<i>Falco tinnunculus</i>)	13%
Barn swallow (<i>Hirundo rustica</i>)	12%
Yellow-legged gull (<i>Larus michahellis</i>)	10%
Caspian turtle (<i>Mauremys caspica</i>)	6%
European hedgehog (<i>Erinaceus europaeus</i>)	6%
Pigeon (<i>Columba livia</i>)	6%
Eurasian stone-curlew (<i>Burhinus oedipnemos</i>)	5%
Mediterranean gull (<i>Ichthyophaga melanocephalus</i>)	4%
Crested lark (<i>Galerida cristata</i>)	3%
Grey partridge (<i>Perdix perdix</i>)	3%
Little owl (<i>Athene noctua</i>)	3%
Mallard (<i>Anas platyrhynchos</i>)	3%
Pallid swift (<i>Apus pallidus</i>)	3%
Common swift (<i>Apus apus</i>)	2%
DNA analysis results pending*	2%
Little tern (<i>Sternula albifrons</i>)	2%
Meadow pipit (<i>Anthus pratensis</i>)	2%
Alpine swift (<i>Tachymarptis melba</i>)	1%
Blackcap (<i>Sylvia atricapilla</i>)	1%
Black-headed gull (<i>Chroicocephalus ridibundus</i>)	1%
Common house martin (<i>Delichon urbicum</i>)	1%
Common kingfisher (<i>Alcedo atthis</i>)	1%
Common shelduck (<i>Tadorna tadorna</i>)	1%
Corn bunting (<i>Emberiza calandra</i>)	1%
Eurasian hobby (<i>Falco subbuteo</i>)	1%
Eurasian skylark (<i>Alauda arvensis</i>)	1%
European nightjar (<i>Caprimulgus europaeus</i>)	1%
Grey heron (<i>Ardea cinerea</i>)	1%
Grey wagtail (<i>Motacilla cinerea</i>)	1%
Kentish plover (<i>Charadrius alexandrinus</i>)	1%
Linnet (<i>Linaria cannabina</i>)	1%
Oystercatcher (<i>Haematopus ostralegus</i>)	1%
Small passerines (<i>Passeriformes spp.</i>)	1%
Willow warbler (<i>Phylloscopus trochilus</i>)	1%
Wildlife strike risk mitigation measures:	
<ul style="list-style-type: none"> • Inspections of the manoeuvring area for wildlife monitoring and control at regular intervals • Pyrotechnics application by the use of signal pistols to scare birds away from the manoeuvring area • Drainage ditches are regularly monitored and when necessary cleaned, to ensure efficient water run-off and, thus, reducing the attractiveness of the airside to the wildlife • Regular grass cutting at the airside. Thessaloniki airport is equipped with tractor • Fence maintenance 	

- Systematic monitoring of bird species populations and their habitat on and off-airport (at a distance of 13km from the airport)
- Holding of the wildlife strike committee meeting, to raise awareness across the airport users and local authorities about the risk of the wildlife strikes on aircraft and the measures applied to mitigate such a risk

Reference year summary results:

Hellenic Civil Aviation Authority (Safety and occurrence management division) receives annual reports referring to the risk assessment of the wildlife hazard as well as to the wildlife hazard management at the 12 regional airports operating by Fraport Greece. Aktion Airport and Chania Airport “Ioannis Daskalogiannis” are excluded, in accordance with the Concession Agreement, Annex 20, paragraph 6.3.3 & 6.3.4.

** DNA analysis results pending” refers to birdstrikes evidence (e.g. blood or part of feathers) that are laboratory analysed for bird species identification*

8. CULTURAL HERITAGE

Have new cultural heritage properties been discovered during the reporting period?	NO
<i>(if YES)</i> Details provided in the table below:	

Location	Date of discovery	Type of discovery	Additional protection measures taken

9. RESOURCES CONSUMPTION

9.1. Energy consumption

Energy consumption (monthly electric energy consumption, in Kwh)	
Total annual electric energy consumption (in Kwh)	14.091.275

9.2. Fuel consumption

Fuel consumption		
Number of FG vehicles at the airport	25	
Number of firefighting vehicles at the airport	6	
Total annual fuel consumption	Diesel (lt)	78.287,75
	Unleaded gasoline (lt)	1.703,97

9.3. Heating oil or natural gas consumption

Heating oil or natural gas consumption	
Total annual heating oil consumption (lt)	11.606
Total annual heating natural gas consumption (m ³)	2.376,7

9.4. Fuel consumption for generator

Water consumption	
Total annual consumption (lt)	19.418

9.5. Water consumption

Water consumption	
Total annual consumption (m ³)	96.403

10. GREENHOUSE GAS EMISSIONS & CARBON FOOTPRINT

Greenhouse gas emissions that were included in the carbon footprint calculation are the CO₂ emissions included in scope 1 & 2 of the GHG protocol:

- Scope 1: Direct GHG emissions that occur from sources that are owned and/or controlled by the airport,
- Scope 2: Indirect GHG emissions from the generation of purchased electricity, steam, heat or cooling consumed by the airport.

Source Flows	Total CO ₂ Emissions (t)
	2021
Direct emissions form heating fuel (scope 1)	507,6
Direct emissions from fuel used for fleet vehicles (scope 1)	170,0
Direct emissions from fuel used for firefighting vehicles (scope 1)	43,0
Direct emissions from fuel used for generators (scope 1)	51,8
Indirect emissions from electricity consumption (scope 2)	8.492,8
Total (t)	9.265,8
Kg CO₂ /passenger	2,69

Notes:

Fraport Greece A is committed to the monitoring, management and reduction of its airports carbon footprint. In order for this target to be achieved:

- Direct and indirect carbon emissions from all the emission sources in the airports' boundaries are calculated and reported, based on the GHG Protocol (scope 1 & 2)
- The airport was certified during the reference year according to ACA (Airport Carbon Accreditation)

11. HUMAN CONSUMPTION WATER MONITORING PROGRAM

Human consumption water quality	
Water supply (public water network or airport's boreholes)	Airport boreholes
Is sampling of the airport's water network performed?	YES
<i>(if YES)</i> Sampling frequency:	Monthly
<p>Summary of results: The results of the microbiological and chemical analyses show that the parameters analyzed as regards the airport's water network are <u>within the legislative limits</u> defined by the Ministerial Decision Γ1 (δ)/ΓΠ οικ. 67322/ GG 3282 B/19-9-2017 regarding the quality of human consumption water.</p>	

12. RAINWATER

RAINWATER (collection, treatment disposal and recipient)		
Area	Collection/treatment/disposal	[YES/NO]
Apron and manoeuvring area	Collected in drainage ditches leading to the sea	YES
Other runoffs (runway etc.)	Collected in drainage ditches leading to the sea	YES
Treatment of rainwater by oil-separator		YES

Rainwater quality	
Is sampling of the airport's rainwater performed?	YES
(if YES) Sampling frequency:	Yearly
Parameters analyzed: pH, conductivity, TSS, DO, NO ₃ , NO ₂ , Oil & grease, BOD, COD, Total Petroleum Hydrocarbons (TPH), PAHs, BTEX, Heavy metals, PCBs, Detergents	
Summary of results:	
Surface rainwater quality is monitored according to the airport's monitoring program. Due to the absence of relevant national quality limits for surface rainwater, the specifications of ref. num. 30/494201κ./1.10.2001 treated wastewater disposal permit issued by the Prefectural Authority of Thessaloniki and the Environmental Health & Safety Guidelines of the International Finance Corporation (IFC) are adopted. According to FG's analyses results and based on the abovementioned specifications, the airport's rainwater environmental condition is adequate and no further treatment measure is necessary	

13. GROUNDWATER AND/OR SOIL AND/OR SOIL GAS MONITORING

Groundwater and/or soil and/or soil gas quality	
Is sampling of the airport’s groundwater and/or soil and/or soil gas performed?	YES*
<i>(if YES)</i> Sampling frequency:	According to the Environmental Terms
Parameters analyzed: TPH, BTEX, MTBE	
Summary of results:	
<p>Groundwater quality is monitored according to the airport’s monitoring program. In addition, the fuel handling companies monitor the quality of groundwater according to the environmental terms. According to FG analyses and the environmental monitoring reports of the fuel handlers, and based on the New Dutch List (2013) which is adopted in the absence of relevant national specifications/limits, the environmental condition of the ground water is found adequate and no decontamination measures are necessary, except from one area identified from the 2017 Environmental Baseline Study, which was under remediation during the reference year. The remediation works of another identified area were successfully completed during the reference year.</p>	

14. SEWAGE TREATMENT AND DISPOSAL

Sewage	
Sewage network to the municipal waste water treatment plant (WWTP)	YES*
Autonomous airport's waste water treatment plant (WWTP)	NO

Blue water
Collection and disposal: Collection in watertight tank and disposal for pretreatment along with other airport's sewerage in the airport's pretreatment unit. Then the wastewater disposed to the municipal sewage network.

**The Airport has been connected to the sewage network of EYATH S.A. and the disposal of the treated effluent to Thermaikos gulf has ceased.*