

ENVIRONMENTAL BULLETIN OF ZAKINTHOS “DIONISIOS SOLOMOS” AIRPORT (ZTH)

Reference year 2021

Fraport Regional Airports of Greece A S.A.

Issue year: 2022

**Environmental Bulletin of Zakynthos Airport
“Dionisios Solomos” (ZTH) - 2021**



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1. INTRODUCTION

1.1. Location

“Dionisios Solomos” airport of Zakinthos (ZTH) is located at the area Ampelokipoi, at 6 km from the capital of Zakinthos and at 1 km from Laganas area. The airport occupies an area of approximately 210 acres (850,000 s.m.).

1.2. Administration

The Airport administratively belongs to the Municipality of Zakinthos that consists of Zakinthos Island and the small remote islands Strofades that are to the south of the island, in the Region of Ionian Islands.

1.3. Environmental licensing

Approved Environmental Terms	
E.T. Decision Reference number	43392/96/17.02.1997
E.T. Amendment Decision Reference Number	127597/02.07.2010
	175512/15.10.2014
	36893/24.11.2017

1.4. Airport Basic Data

Airport name IATA / ICAO	ZTH / LGZA
Airport location – Airport Reference Point (ARP)	Latitude: 37° 45' 03" N Longitude: 20° 53' 03" E
Altitude	5m
Number of runways	1
Operation hours (summer)	05:00-22:00
Operation hours (winter)	Monday 17:00 – 21:00 Tuesday CLOSED Wednesday /Friday 09:00 – 13:00 Thursday /Saturday 08:00 – 19:00 Sunday 15:00 – 19:00

Runways	Length/Width					Code
Runway	2,228 m x 45 m					16/34
Full length of parallel taxiway	N/A					
Number of taxiways	3					
Apron capacity	A	B	C	D	E	
	-	-	4	3	-	
Employees	High season (31.08.2021)			Low season (30.11.2021)		
Fraport Greece (FG) employees	26			23		
Employees of other companies	643			216		

Terminal	
➤ Total area (m ²)	25.348
Other buildings and service/storage areas	
➤ RFF Station (m ²)	1.144
Parking Areas	
Car parking spaces	194
Bus parking spaces	26
Taxi parking spaces	42

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	9.426
Percent of increase or decrease in relation to the previous year	94,3 %
Annual passenger traffic	1.012.913
Percent of increase or decrease in relation to the previous year	135,4%
Annual cargo transferred (tn)	0
Percent of increase or decrease in relation to the previous year	0 %

Aircraft types	
Prevailing aircraft types for domestic flights	
Aircraft type	No. of flights
AT45	456
DH8D	286
AT46	216
AT75	152
AT72	98
AT76	82
A320	72
A20N	39
A32A	32
AT43	16
Other	228
Prevailing aircraft types for international flights	
Aircraft type	No. of flights
B73H	2.371
A320	1.438
B738	1.378
7M8	360
A321	218
A32A	208
A319	186
A32B	174
A21N	162
7S8	146
Other	1.108

¹ Military and training flights not included.

2.2. High season traffic data

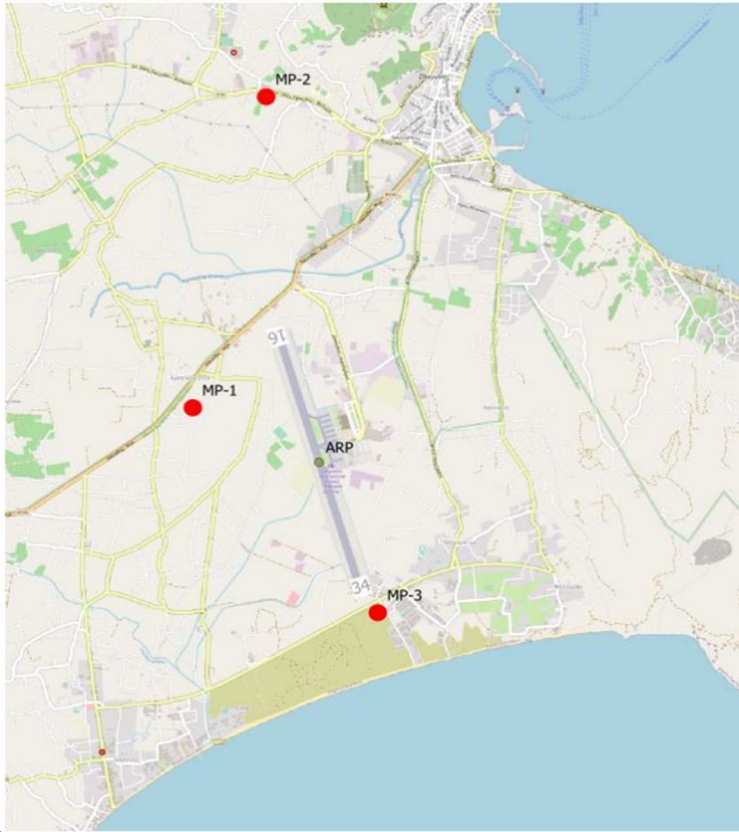
High season traffic data (June-September)	
Highest traffic month	August
Air traffic movements during the month with highest traffic	2.611
Air traffic movements daily average number during the month with highest traffic	84

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	66
Air traffic movements daily average number during the month with lowest traffic	2

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
Measurement points		
		
Measurement points coordinates	Measurement points description	
Position 1: 37° 45' 20" N 20° 52' 20" E	Ampelokipoi area, to the west of the runway in the yard of a gas station. Affected by all flights to both directions	
Position 2: 37° 46' 51" N 20° 52' 45" E	Gaitani area, to the north of the runway in the garden of a private house. Affected by departures from runway 34 and arrivals on runway 16.	
Position 3: 37° 44' 20" N 20° 53' 23" E	To the south of the runway, in the yard of a hotel. Affected by arrivals on runway 34 and departures from runway 16.	
Measurement period	26.07.2021 -27.07.2021	
Noise indicators	L _{den} , L _{night}	

Summary of measurement results:

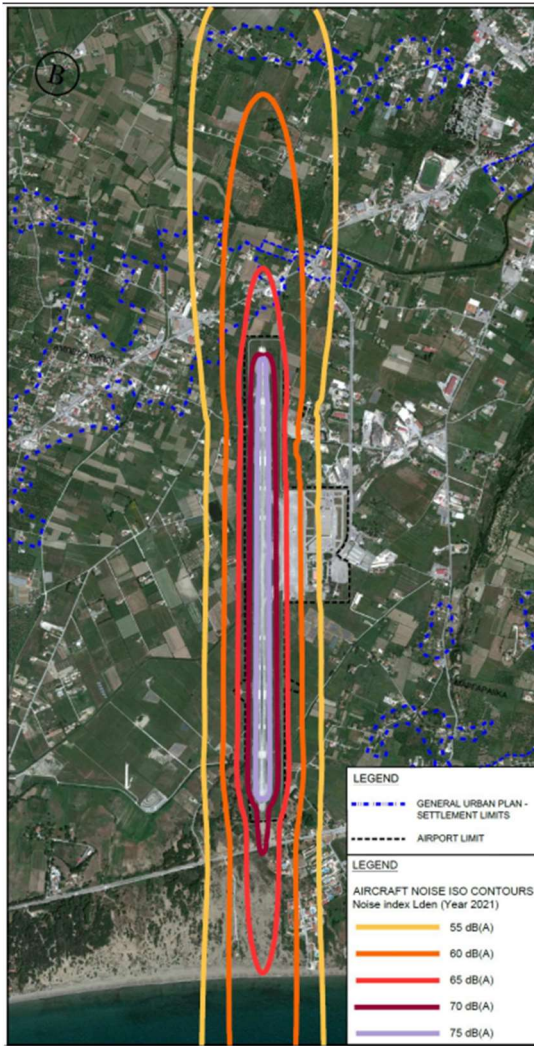
Noise levels are monitored according to the airport’s monitoring program.
No exceedance of noise indicators levels L_{den}=70 dB(A) and L_{night}=60 dB(A) was observed.

3.2. Noise levels calculation based on noise simulation software

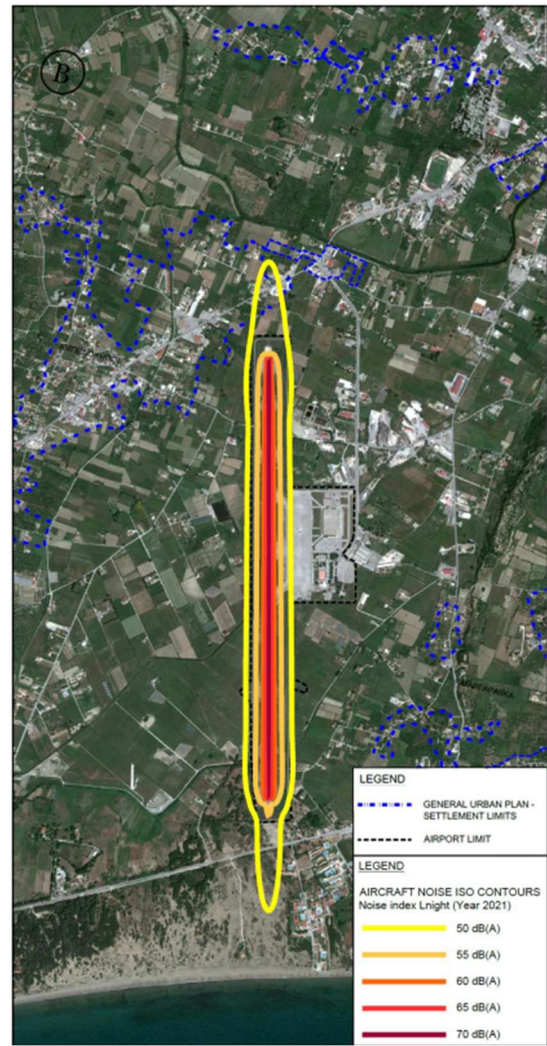
Aircraft noise levels calculation based on noise simulation software	YES
Software used: IMMI Noise Prediction Software (methodology CNOSSOS-EU according to Directive 2015/996/EU)	

Noise indicators and respective contours calculation: L_{den} , L_{night}

Noise contours:



L_{den}



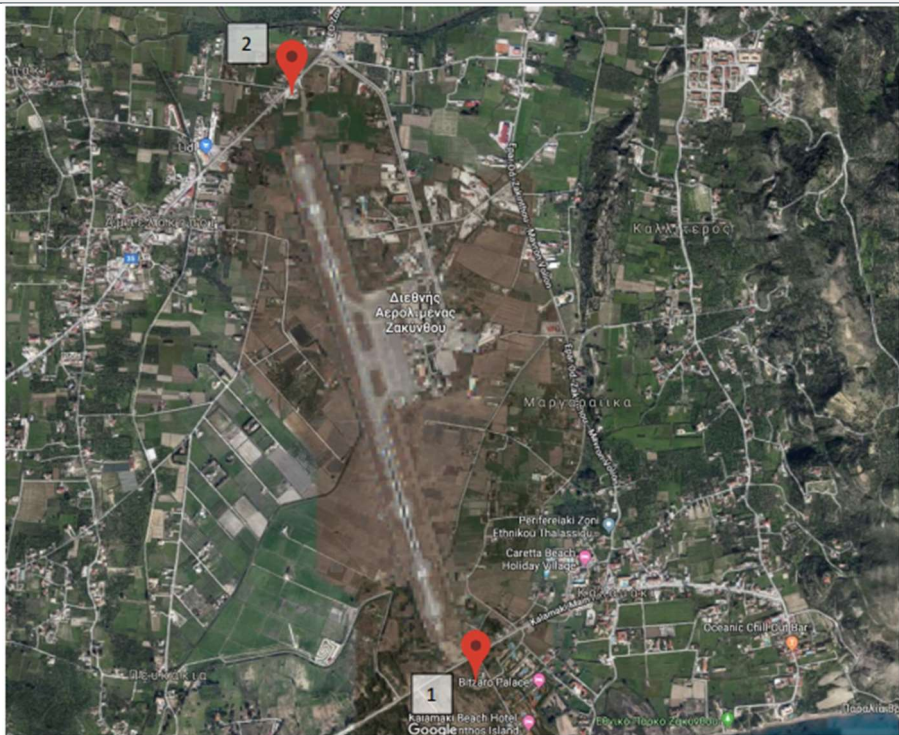
L_{night}

Summary of results:

For the year 2021 no populations or buildings inside 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).

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 1	At a distance of approximately 650m from the north part of the runway, at Ampelokipoi area	
Position 2	Kalamaki area, at a distance of approximately 1 km from the south part of the runway	
Measurement period:	27.04.2021 – 12.05.2021	
Pollutants measured:	PM ₁₀ , PM _{2,5} , NO ₂ , SO ₂ , C ₆ H ₆ , O ₃	

Summary of measurement results:

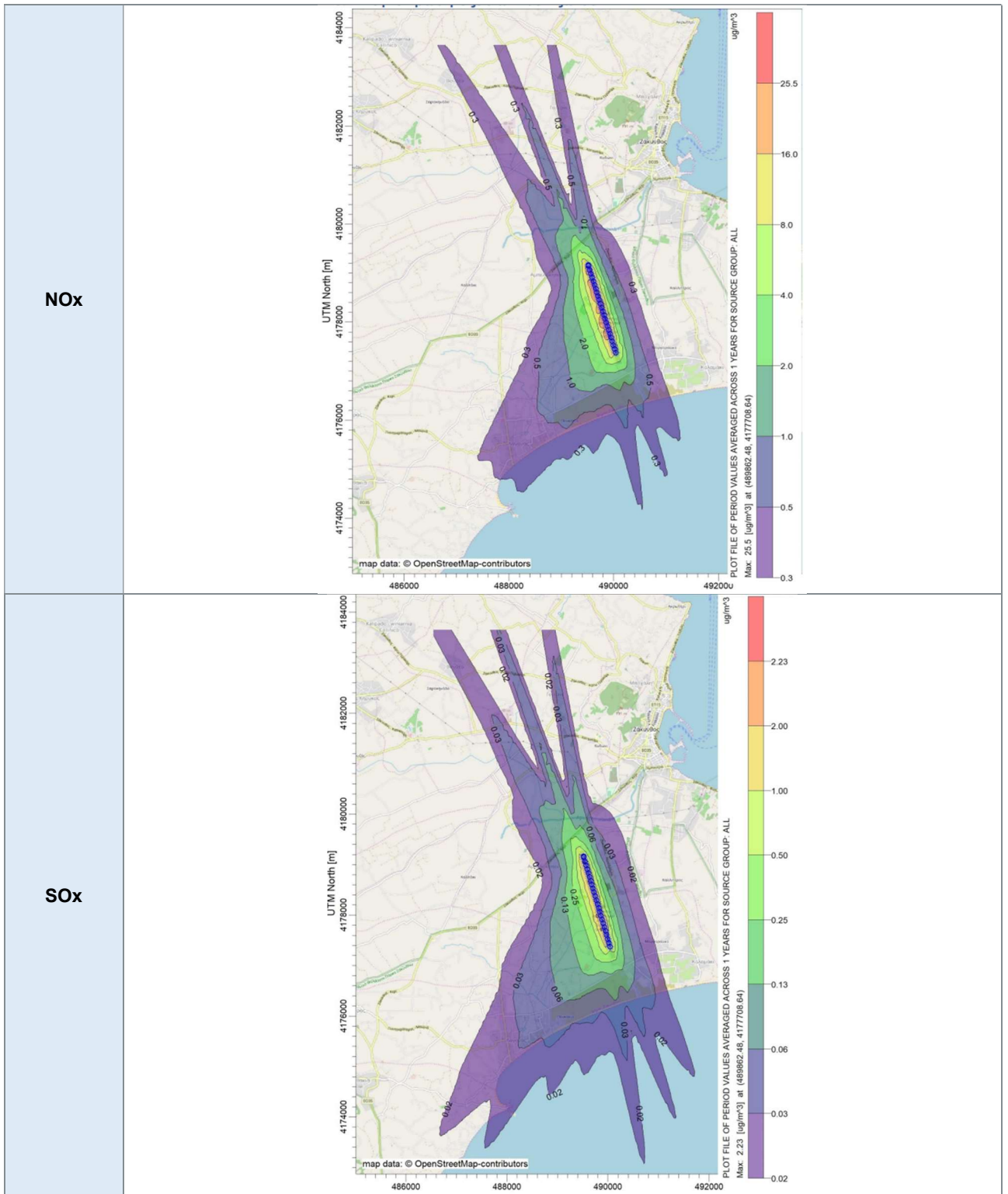
Air quality is monitored according to the airport’s monitoring program.

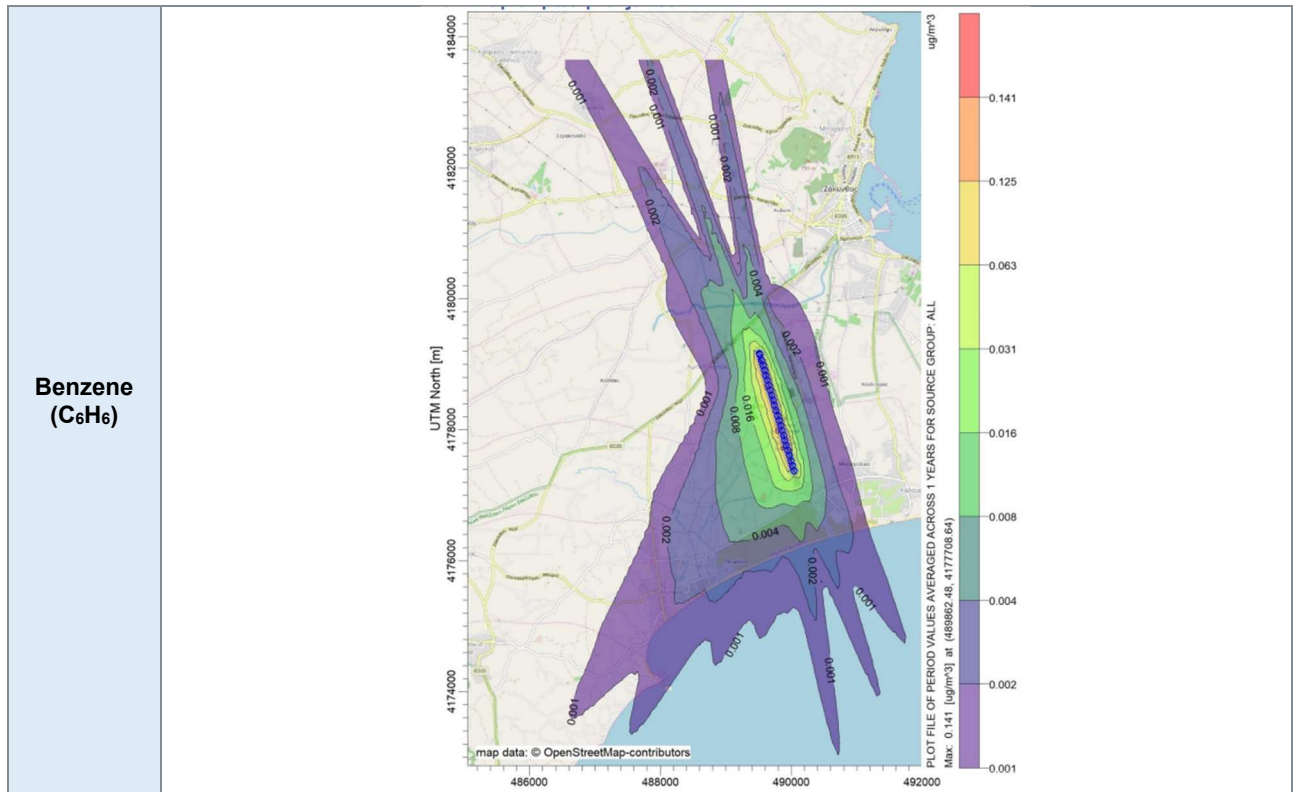
No exceedance of the air quality limits was observed for PM₁₀, PM_{2,5}, NO₂, SO₂ & C₆H₆.

It is noted that some individual exceedances for PM₁₀ were recorded only in position 2 and only for 1 day, so it is an isolated event. Regarding the exceedances of the O₃ pollutant and its dependency on the solar radiation, ozone does not show a homogenous trend during the year. Increased ozone concentrations are recorded usually at the end of spring and beginning of summer, especially during the days with high sunlight. Therefore, these momentary exceedances are considered to be individual occurrences not related to the airport’s operation.

4.2. Air pollutants emission and dispersion modelling

Calculation of air pollutants concentrations based on an emission and dispersion modelling software		YES
Software used: Aviation Environmental Design Tool (AEDT) - US Federal Aviation Administration & US Environmental Protection Agency AERMOD		
Pollutants concentrations and respective contours calculation: PM ₁₀ , NO _x , SO _x , C ₆ H ₆		
PM₁₀		





Summary of results:

Air quality is monitored according to the airport's monitoring program.
No exceedance of the air quality limits was observed.

5. WASTE MANAGEMENT

Waste	Collection	Management/Disposal
Recyclables (paper, plastic, metals, glass)	Separate collection by Zakinthos solid waste management body	Disposal at material recovery facility for recycling
Residues (Mixed Waste) and Bulky Waste	Collection by Zakinthos solid waste management body	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?	YES
<p>(if YES) Short description: Zakynthos airport is located within the limits of the National Marine Park of Zakynthos (NMPZ). Part of the airport is located within the protected area “Lagana Gulf of Zakynthos and Islands Marathonisi and Pelouzo” with code GR2210002.</p>	
Fauna	
Are there protected species of fauna/birds in the broader airport area?	YES
<p>(if YES) Short description: The airport of Zakynthos is located within the National Marine Park of Zakynthos (NMPZ). The Marine Park includes the marine area and the islands of Laganas Gulf, the sea turtles egg-laying beaches and a land zone surrounding the latter, the Keri Lake wetland and Strofades Islands. The islands are of high ecological value, mainly due to the migratory avifauna observed. Due to their location, they are a migratory station or passage of migratory passeriformes, whereas massive presence of migratory <i>Streptopelia turtur</i> quails is observed in spring.</p> <p>The protected bird species that have been observed at Zakynthos airport since April 2017 are presented below:</p> <p><i>European kingfisher (Alcedo atthis), European turtle-dove (Streptopelia turtur), Garganey (Anas querquedula), Great egret (Casmerodius albus), Lesser kestrel (Falco naumanni), Marsh harrier (Circus aeruginosus), Montagu’s harrier (Circus pygargus), Pallid harrier (Circus marcourus) Purple heron (Ardea purpurea), Red-footed falcon (Falco vespertinus), Short-toed snake eagle (Circaetus gallicus), White stork (Ciconia ciconia)</i></p>	

6.2. Ecologically fragile areas

The airport of Zakynthos is located within the National Marine Park of Zakynthos (NMPZ). Part of the airport is located within the protected area “Lagana Gulf of Zakynthos and Islands Marathonisi and Pelouzo” with code GR2210002

7. WILDLIFE HAZARD MANAGEMENT

Wildlife strikes and wildlife hazard management measures	
Wildlife species that suffered a strike	Strikes (%)
Common kestrel (<i>Falco tinnunculus</i>)	27%
European hedgehog (<i>Erinaceus europaeus</i>)	18%
Barn swallow (<i>Hirundo rustica</i>)	9%
European greenfinch (<i>Carduelis chloris</i>)	9%
House sparrow (<i>Passer domesticus</i>)	9%
Little-ringed plover (<i>Charadrius dubius</i>)	9%
Meadow pipit (<i>Anthus pratensis</i>)	9%
Pigeon (<i>Columba livia</i>)	9%
Wildlife strike risk mitigation measures:	
<ul style="list-style-type: none"> • Inspections of the manoeuvring area for wildlife monitoring and control at regular intervals • 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. Zakynthos 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:	
<p>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.</p>	

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)	2.686.440

9.2. Fuel consumption

Fuel consumption		
Number of FG vehicles at the airport	5	
Number of firefighting vehicles at the airport	4	
Total annual fuel consumption	Diesel (lt)	7.252,79
	Unleaded gasoline (lt)	98,94

9.3. Heating oil or natural gas consumption

Heating oil or natural gas consumption	
Total annual heating oil consumption (lt)	25.039
Total annual heating natural gas consumption (m ³)	N/A

9.4. Fuel consumption for generator

Water consumption	
Total annual consumption (lt)	1.935

9.5. Water consumption

Water consumption	
Total annual consumption (m ³)	17.406

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)	66,8
Direct emissions from fuel used for fleet vehicles (scope 1)	21,0
Direct emissions from fuel used for firefighting vehicles (scope 1)	14,4
Direct emissions from fuel used for generators (scope 1)	5,2
Indirect emissions from electricity consumption (scope 2)	1.619,1
Total (t)	1.726,1
Kg CO₂ /passenger	1,70

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 ISO 14064 regarding greenhouse gas emission by an independent certification body

11. HUMAN CONSUMPTION WATER MONITORING PROGRAM

Human consumption water quality	
Water supply (public water network or airport's boreholes)	Municipal Water & Sewage Company (DEYA) of Zakinthos
Is sampling of the airport's water network performed?	YES
(if YES) Sampling frequency:	Quarterly
<p>Summary of results: The results of the chemical analyses show that the water supplied from the DEYA of Zakinthos is not potable due to the existence of high concentrations of Sodium and Chlorine (brackish water). The other results of the microbiological and chemical analyses show that the parameters analysed as regards the airport's water network are within the legislative limits defined by the Ministerial Decision Γ1 (δ)/ΓΠ οικ. 67322/ GG 3282 Β/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		NO*

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 designated recipients and relevant national quality limits for surface rainwater, 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.	

**According to the approved environmental terms of Zakinthos Airport six adequately designed sand collectors were constructed in order for rainwater to be discharged to the natural recipient free of pollutants.*

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
(if YES) Sampling frequency:	According to the Environmental Terms
Parameters analyzed: TPH, BTEX, MTBE (groundwater) & volatile hydrocarbons, aliphatic, aromatic and chlorinated (soil gas)	
Summary of results:	
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 the environmental monitoring reports of the fuel handlers, and based on the New Dutch List (20013) which is adopted in the absence of relevant national specifications/limits, the environmental condition of the ground water & soil gas is found adequate and no decontamination measures are necessary. Regarding soil gas the Directive of the Munich Environmental Protection Department in force by 10.02.1998, which is the most widely accepted, is adopted as a basis for comparison.	

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 to the municipal sewage network.

Waste water treatment plant description (where applicable) <i>Description of characteristics and condition of the airport’s WWTP including possible problems. Type and frequency of the effluent quality measurements.</i>	
Degree of treatment of airport’s WWTP	N/A
Treatment method	N/A
Disposal of treated wastewater	N/A
Sludge disposal	N/A
Sampling frequency of WWTP effluent	N/A
Parameters analyzed	N/A
Summary of quality of WWTP effluent	N/A