

## **Appendices**



## **Appendix 1 - Detailed Aircraft Movement:**



## Numbers and types of aircrafts

from: 1/1/2013 to: 31/12/2013

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HEBA برج العرب
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هد تر دقت	انطراز			
88	A319			
1177	A320			
109	A320-214			
25	A320-220			
312	A321			
23	A322			
24	A330			
1	A332			
29	A340-200			
8	AGUSTA AW139			
2	Airbus A300-605R (A300B4			
G .	Airbus A310-308			
1	AIRBUS A319-100			
92	AIRBUS A319-111			
1	AIRBUS A319-112			
3	AIRBUS A319-114			
50	AIRBUS A319-114 (ER)			
7	Airbus A319-132			
2	Airbus A319-132 (LR) (CJ)			
15	Airbus A319-133 (LR) (CJ)			
8	AIRBUS A320			
2	AIRBUS A320-211			
273	Airbus A320-212			
3946	Airbus A320-214			
60	Airbus A320-214 Prestige			
1900	Airbus A320-231			
617	Airbus A320-232			
12	Airbus A320-233			
1	AIRBUS A321			
1	AIRBUS A321-111			
4	AIRBUS A321-211			
2	AIRBUS A321-212			
20	Alebum A 994 994			



17	AIRBUS A330
18	AIRBUS A330-200
11	AIRBUS A330-202
5	AIRBUS A330-223
17	Airbus A330-243
1	Airbus A330-302 (X)
38	AIRBUS A330-321
37	AIRBUS A330-342
27	AIRBUS A340-200
1	Airbus A340-212
3	AN74
2	ANTONOV AN-26
2	ATR 42-500
1	ATR 42-600
7	ATR 72-212
1	ATR 72-500 (72-212A)
4	ATR 72-600
1	ATR72-600
6	AVRO RJ100 (BAE AVRO 1
1	Avro RJ85 (BAe Avro 146-F
36	AW139
3	B 738
1	B190
1	B-300
1	B350
1	B350 KING AIR
81	B734
309	B737
6	B-737
16	B737-500
13	B737-700
149	B737-800
17	B-737-800
39	B738
2	B747
7	BAE 146-100
3	BAE 146-300



2	BAE 146-300A
1	BE19
6	BE20
1	BE200
1	BE40
1	Beechcraft 1900D (Beech 1
2	BEECHCRAFT BE40
5	Beechcraft Catpass 200 (Be
1	Beechcraft King Air 200C (i
4	BEECHCRAFT KING AIR 35
6	BEECHCRAFT KING AIR 35
1	BEECHCRAFT KING AIR 9(
1	BEECHCRAFT KING AIR A:
1	BEECHCRAFT KING AIR B:
2	Beechcraft King Air B200 (i
1	Beechjet 400A (Beech 400/
1	Bell 212
72	Bell 412EP
13	Bell 412HP
5	Boeing (McDonnell Dougia
6	Boeing (McDonnell Dougia
1	Boeing 737-2N9C Advance
52	BOEING 737-300
1	BOEING 737-33V
1	BOEING 737-3Q8
38	BOEING 737-401
6	BOEING 737-700 (WINGLE1
2	Boeing 737-72U (BBJ) (win
1	BOEING 737-800
63	BOEING 737-800 (WINGLEI
3	BOEING 737-804
3	Boeing 737-808 (winglets)
27	Boeing 737-866 (winglets)
3	BOEING 737-8BK
52	Boeing 737-8F2
7	Boeing 737-8F2 (winglets)
36	Boeing 737-8GK (winglets)



13	BOEING 737-8K5 (WINGLE)
6	Boeing 737-8Q8
6	BOEING 747-121
1	BOEING 747-481
1	Boeing 767-304 (ER)
1	Boeing 777-21H (ER)
4	Boeing 777-266 (ER)
7	Bombardler Challenger 604
2	BOMBARDIER CRJ200ER (
131	Bombardler CRJ900 (CL-60
29	BOMBARDIER CRJ900ER (
97	Bombardler CRJ900LR (CL
35	Bombardler CRJ900LR Nex
329	Bombardler DHC-8-315 Q3(
20	Bombardler DHC-8-402 Q4(
1	Bombardler Global 5000 (B
9	BOMBARDIER GLOBAL EX
3	Bombardler Learjet 31
5	Bombardler Learjet 35A
8	Bombardler Learjet 60
1	C12
12	C130
10	C172
1	C208B
1	C295
1	C525
1	C-56X
2	C650
5	C90GTI
1	CASA
1	CASA 352A-3 (JUNKERS JI
1	CESSNA 172-C172
2	Cessna 208 Caravan I
2	CESSNA 208B GRAND CAF
1	CESSNA 501 CITATION USI
1	Cessna 560 Citation Encore
2	Cessna 560XL Citation XLS



3	CESSNA 650 CITATION III
7	Cessna 680 Citation Sovere
1	CHALLENGER CL-605
1	CL60
1	CRJ.200
1	CRJ2
2	CRJ200
1	CRJ-200
1	DA42NG
31	DASH8-Q400
1	DASSAULT FALCON 200
1	DASSAULT FALCON 2000
1	Dassault Falcon 20E-5
1	Dassault Falcon 900B
1	DC 3
1	DCH6-400
1	De Havilland DHC-6-300 Tw
13	De Havilland DHC-7-102 Da
1	DHC-6
18	DHC8
59	DHC-8
1	DIAMOND DA42 TWIN STAI
1	Dornler 328JET (328-300 M
102	E 170
273	E170
9	E190
2	EC155B
10	EMBRAER 170
140	Embraer 170LR (ERJ 170-1)
454	Embraer 170SE (ERJ 170-1)
20	Embraer 175LR (ERJ 170-2)
16	Embraer 190LR (ERJ 190-1)
93	EMBRAER 195AR (ERJ 190
66	EMBRAER 195LR (ERJ 190
1	EMBRAER E300
2	EMBRAER RJ135ER (EMB-
1	Embraer RJ135LR (EMB-13
	I I



3	ERJ
2	Eurocopter (Aerosp.) AS33
1	Eurocopter (Aerosp.) A\$35
1	EUROCOPTER EC155B
1	EUROCOPTER EC225LP
1	F900
1	Fokker 50 Freighter (LCD) (
1	FOKKER100
1	Gulfstream G100 (IAI Astra
1	Gulfstream G300-MPA (Gul
2	Gulfstream GV (Gulfstream
2	Hawker 400XP (Raytheon 4
1	HAWKER 800XP (RAYTHEC
1	Hawker 800XP (wi) (Raythe
1	Hawker 850XP (Raytheon H
2	Hawker 900XP (Hawker Bee
1	HAWKER SYDENY(HS125E
1	HAWKER400XP
430	HEL
7	HEL-412
117	HELL.
1	HS900XP
1	Kamov Ka-328
1	KING AIR 90
15	LEARJET 60
5	LJ 45
1	LJ60
2	LOCKHEED VC-130H (382C
4	LOCKHEED VC-130H (382C
1	LR45
1	LR60
1	MD900EX
1	MIL MI-8
1	MILMI-8AMT
2	MII MI-8MTV-1
1	MILMI-8P
1	MII MI-8T



1	MITSUBISHI MU-2B-60 MAF
5	PA-31-350 NAVAJO CHIEF1
2	PC-6/B2-H4
1	PILATUS PC-12/45
1	PILATUS PC-6/B2-H4 TURE
1	PIPER PA-31T3 T1040
2	RJ100
2	Rockwell 690 Turbo Comm
1	SA5
74	Tupolev Tu-204-120
1	VULCANAIR (PART.) AP68
1	Vulcanair (Partenavia) P68i
1 2 1 74 1 1	PIPER PA-31T3 T1040 RJ100 Rockwell 690 Turbo Comm SA5 Tupolev Tu-204-120 VULCANAIR (PART.) AP68 Vulcanair (Partenavia) P68

## Total aircraft movement

Aircrafts Movements			
Year 2014 20825			
Year 2013	25986		
Year 2010	7312		
Total	54123		

### Total passenger movement

Passengers Movement				
Year 2014	2021892			
Year 2013	2260540			
Year 2010	712073			
Total	4994505			



# Appendix 2 - No. and types of Aircrafts for INM



### <u>Flights Operations during Day, Evening and Night Using DNL Noise</u> <u>Metric used for INM (Noise model)</u>

Year	Aircraft	Number of flights during					
	Туре	Day	Evening	Night	Total	Total	
	DHC8	0	13	12	25		
	737500	5	5	5	15		
2015	A320	7	7	16	30		
2015	B767	0	0	7	7	37	
	B777	0	0	7	7		
	B747	0	0	5	5		
		Total			99		
	DHC8	0	18	22	40		
	737500	6	6	6	18		
2020	A320	12	24	24	60		
2020	B767	0	6	10	16	43	
	B777	0	6	6	12		
	B747	0	0	7	7		
		Total			153		
2025	DHC8	0	20	20	40		
	737500	7	7	6	20		
	A320	18	36	36	90		
	B767	0	9	16	25		



	B777	0	9	9	18	
	B747	0	0	7	7	
		Total			200	
	DHC8	0	25	25	50	
2030	737500	8	8	9	25	
	A320	22	42	42	106	
	B767	0	11	19	30	
	B777	0	11	19	30	
	B747	0	0	9	9	
Total					250	

### <u>Flights Operations during Day, Evening and Night Using WECPNL Noise</u> <u>Metric</u>

Year	Aircraft Type	Number of flights during				
		Day	Evening	Night	Total	Total
	DHC8	0	9	11	20	37
	737500	0	4	6	10	
2015	A320	7	7	13	27	
2013	B767	0	0	8	8	
	B777	0	0	8	8	
	B747	0	0	5	5	
		Total			78	



	DHC8	0	16	16	32	
2020	737500	0	4	6	10	
	A320	11	15	24	50	
	B767	0	6	9	15	43
	B777	0	5	5	10	
	B747	0	0	4	4	
		Total		•	121	
	DHC8	4	14	18	36	
	737500	0	4	6	10	
2025	A320	18	26	26	70	
2025	B767	24	6	12	22	56
	B777	4	4	8	16	
	B747	0	0	4	4	
		Total			158	
	DHC8	6	20	22	48	
	737500	0	5	8	13	
2030	A320	22	32	32	86	
2030	B767	5	7	12	24	
	B777	6	7	9	22	
	B747	0	0	5	5	
Total						



# Appendix 3 -Monitoring Form by JICA



## To be filled by EAC environmental unit at Borg Al Arab airport During construction and operation Phase MONITORING FORM

-If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews. JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent. When necessary, the project proponent should refer to the following monitoring form for submitting reports.

-When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered.

#### 1. Responses/Actions to Comments and Guidance from Government Authorities and the Public

Monitoring Item	Monitoring Results during Report Period
Ex.) Responses/Actions to Comments and Guidance from Government Authorities	

#### 2. Mitigation Measures

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
SO <sub>2</sub>						
NO 2						
СО						
03						
Soot and dust						
SPM						
Dust						

#### - Air Quality (Emission Gas / Ambient Air Quality)



<b>Ouality</b> )	
(	Juality)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
рН						
SS (Suspended Solid)						
BOD/COD						
DO						
Total Nitrogen						
Total Phosphorus						
Heavy Metals						
Hydrocarbons / Mineral Oils						
Phenols						
Cyanide						
Temperature						

#### - Waste

Monitoring Item	Monitoring Results during Report Period

#### - Noise / Vibration

ltem	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Noise level						
Vibration level						



- Odor

0.001	
Monitoring Item	Monitoring Results during Report Period

#### **3**. Natural Environment

#### - Ecosystem

Monitoring Item	Monitoring Results during Report Period
Ex.) Negative effects/Actions to Valuable species	

### $4\,.\ \, {\rm Social}\ \, {\rm Environment}$

#### - Resettlement

Monitoring Item	Monitoring Results during Report Period

#### - Living / Livelihood

Monitoring Item	Monitoring Results during Report Period



## Appendix 4 - Noise Readings and Measurements



## **Instrumentation**

All the instruments are manufactured by Bruel & Kjaer (B&K), the world's leading company in noise measurement, located in Denmark.

Two main instruments were used in the measurements:

- Modular Precision Sound Analyzer Type 2260
- The Serial Number of the sound level meter is 2305245



Modular Precision Sound Analyzer Type 2260

2250 sound level meter

The instruments will be calibrated using B&K Sound Level Calibrator Type 4231, which produces a reference sound of 94 dB. The calibration is performed for the microphones and the instruments before and after each group of readings.

The microphones were mounted on Tripods Type UA0801 at a height of 1.2 meters from the ground surface.



## **Standards:**

The instruments conform to:

IEC651 (1979) and IEC804 (1985) Type 2;

ANSI S1.4 (1983) and draft S1.43 (1992) Type 2;

BS 5969 and BS 6698 Type 1.

Instrumentations for Vibration measurements

Data Collector System — 2526 Series

Data Collector Type 2526 MK2

Intrinsically Safe Data Collector Type 2526E

Balancing Program Type 7111

Field Analysis & Balancing (FAB) Program Type 7112



**First Measurments group:** 





Points	Coord	linates
1	30.992674	29.648759
2	31.007708	29.638053
3	31.007703	29.637998
4	30.994209	29.648024
5	30.977407	29.660831
6	30.977338	29.660849
7	30.977367	29.660892
8	30.969112	29.665646
9	30.963868	29.669262
10	30.943736	29.675061
11	30.943791	29.675164
12	30.943766	29.675162

Locations	LAeq	LASmax	LApeak	LASmin	LAF1	LAF5	LAF10	LAF50	LAF90	LAF95	LAF99
Location 1	66.91	82.57	107.62	44.94	78.58	71.39	68.86	59.65	46.85	45.84	44.66
Location 2	61.31	72.88	92.68	43.75	72.05	67.72	65.30	53.57	46.28	45.26	43.86
Location 3	65.06	75.3	95.41	44.75	75.90	71.67	69.16	57.94	45.69	45.10	43.83
Location 4	68.27	81.11	95.76	42.66	80.39	77.18	71.77	49.45	43.56	43.04	42.48
Location 5	70.33	79.01	97.4	50.02	79.61	77.04	75.08	64.78	54.12	50.96	49.45
Location 6	74.82	88.91	103.76	57.24	85.13	79.83	77.76	70.61	62.15	60.37	56.75
Location 7	68.78	85.65	104.43	52.92	78.20	73.58	71.73	61.27	56.75	55.64	54.29
Location 8	70.88	82.17	103.45	56.58	81.23	76.76	73.88	66.31	59.44	58.28	56.09
Location / 9	63.69	75.26	101.11	54.96	71.31	68.17	66.63	61.54	56.86	55.69	54.06
Location 10	69.92	86.8	105.05	53.63	80.12	74.05	71.97	64.52	56.58	54.94	52.55
Location 11	68.81	77.23	96	57.63	75.03	73.01	71.88	67.62	62.00	60.56	57.67
Location 12	73.6	82.98	99.86	54.96	82.09	79.32	77.49	70.59	60.03	56.57	52.90













0004.S3A 10/10/2014 10:29:24 AM - 10:33:24 AM dB 120 110 100 90 80 70 60 50 40 30 16 31.50 1000 63 LAEq LAFmax LAFmin Cursor: 1000 Hz LAEq=59.8 dB LAFmax=77.5 dB LAFmin=43.6 dB LAFmin







## **Measurements photos**































## 2nd noise measurements group







Google maps shows measures locations



#### Measurements inside airport area

Readings	Start time	LAeq	LASmax	LApeak	LASmin	LAF1	LAF5	LAF10	LAF50	LAF90	LAF95	LAF99
Reading 1	01:35:50 PM	62.69	70.27	90.26	48.61	71.46	69.04	67.03	58.63	52.53	48.87	45.45
Reading 2	01:39:19 PM	76.88	85.08	101.58	66.31	85.87	81.70	79.99	74.58	68.71	66.98	65.71
Reading 3	01:43:16 PM	72.61	80.93	94.79	65.76	80.82	79.34	76.03	69.36	66.76	66.41	65.59
Reading 4	01:45:19 PM	70.26	79.53	93.75	64.56	79.17	76.03	72.50	68.01	65.70	65.43	64.70
Reading 5	02:16:02 PM	60.46	65.21	89.95	56.97	65.93	62.42	61.00	59.98	59.32	59.16	58.87
Reading 6	02:17:06 PM	60.41	70.62	84.13	52.3	71.11	67.78	64.46	53.93	52.56	52.28	51.75
Reading 7	02:19:47 PM	53.47	60.28	86.44	50.44	62.43	57.60	55.37	51.69	50.62	50.38	49.96
Reading 8	02:21:00 PM	48.1	58.78	91.06	45.8	53.20	49.41	48.28	46.90	46.06	45.86	45.57
Reading 9	02:33:54 PM	53.41	64.75	91.1	43.48	64.57	58.99	56.16	47.50	42.79	42.15	41.36
Reading 10	02:34:58 PM	53.57	57.44	73.67	45.9	59.09	57.72	56.77	51.53	46.20	45.49	43.74
Reading 11	02:36:01 PM	59.53	67.55	85.83	51.23	68.57	65.27	63.19	56.44	50.99	49.70	48.49
Reading 12	02:37:07 PM	55.67	63.32	81.57		65.46	62.19	59.90	50.56	42.13		
Reading 13	02:39:08 PM	85.93	100.08	114.66	44.32	101.22	88.17	77.36	57.00	46.41	45.54	44.05
Reading 14	02:41:35 PM	68.44	80.58	96.83	44.08	81.36	76.51	70.49	55.62	45.73	44.71	43.37
Reading 15	02:50:22 PM	65.08	78.48	99.61	53.58	75.93	69.98	64.97	57.35	55.10	54.80	54.41
Reading 16	02:52:28 PM	54.55	60.96	85.57	47.74	61.70	57.25	56.10	54.11	49.32	47.87	47.03
Reading 17	02:55:10 PM	50.55	59.75	78.77	41.52	60.85	55.46	53.41	47.38	42.07	41.36	
Reading 18	02:56:39 PM	44.5	52.91	77.42		53.38	48.82	47.39	43.24			
Reading 19	02:57:49 PM	46.7	52.16	76.31		54.73	51.65	50.42	44.68			
Reading 20	02:59:47 PM	43.62	56.1	80.5		56.40	48.90	45.43				
Reading 21	03:00:51 PM	73.94	85.56	99.56		86.13	83.24	77.42	43.83			
Reading 22	03:01:54 PM	64.1	78.76	91.09	46.42	78.87	70.20	65.55	54.15	46.31	45.11	43.69
Reading 23	03:05:47 PM	75.59	85.09	99.03	49.75	85.48	84.62	82.17	60.73	51.10	49.61	47.51
Reading 24	03:12:41 PM	77.09	86.67	99.49	47.84	86.94	85.59	82.98	61.22	49.46	48.64	45.24
Reading 25	03:19:32 PM	79	84.79	84.79	70.62	87.15	82.30	80.71	77.75	75.47	74.56	71.50

--- Means  $\leq 40 \text{ dB}$ 



Readings	Description					
Reading 1	At arriving hall In the terminal building					
Reading 2	At tarmac area during serving plane					
Reading 3	At tarmac area during serving plane at another location					
Reading 4	At tarmac area during serving plane at another location					
Reading 5	Front of cargo village					
Reading 6	Front of cargo village at another location					
Reading 7	Front of water station treatment					
Reading 8	Front of Egypt air fuel station					
Reading 9	Beside run way Next to beginning end as a background					
Reading 10	Beside run way Next to middle					
Reading 11	The same location during passing plane on taxi way					
Reading 12	Beside run way as Background value					
Reading 13	Beside run way near to beginning During takeoff event					
Reading 14	In the end of run way during landing event					
Reading 15	In the end of run way during passing service bus					
Reading 16	In the end of run way as Background value					
Reading 17	In the end of run way as Background value					
Reading 18	In the end of run way as Background value					
Reading 19	In the end of run way as Background value					
Reading 20	In the end of run way as Background value					
Reading 21	In the end of run way during passing plane in the end of it					
Reading 22	In the end of run way during passing plane in the beginning of it					
Reading 23	In the end of run way during takeoff event					
Reading 24	In the end of run way during takeoff event for another plane					
Reading 25	At tarmac at moving Luggage service					



## 1/3 Octave







EISA for Borg Al Arab Airport phase 2 www.melbardisi.com











Reading 12

EISA for Borg Al Arab Airport phase 2 www.melbardisi.com

**Reading 11**




Reading 18

EISA for Borg Al Arab Airport phase 2 www.melbardisi.com

**Reading 17** 

A L

A L Hz





Reading 23







Reading 25



## Measurements photos











EISA for Borg Al Arab Airport phase 2 www.melbardisi.com



## 3rd noise measurements group



Points	Coordinates		
1	Final Landing Point	30°53'35.93"N	29°43'3.21"E
2	Abobakr ValleyBackground	30°53'43.61"N	29°44'19.27"E
3	Chiek Point-Road Entrance	30°57'28.96"N	29°50'6.20"E
4	PalestineValley School	30°56'26.07"N	29°48'15.41"E
5	Airport Gate	30°56'48.82"N	29°42'3.86"E
6	Airport Road	30°56'26.34"N	29°45'33.45"E
7	Elmahgar Background	30°56'18.55"N	29°47'54.47"E



Near Airport Noise Measurements				
Noise Mode	Start Time	LAeq	LAFMax	LAFMin
Background	11:55:00			
Noise	ص	51.51	53.69	52.9
	11:59:01			
Aircraft Movement	ص	73.11	74.3	63.05





Elhorya Vally Noise Measurements				
Noise Mode	Start Time	LAeq	LAFMax	LAFMin
Background	12:30:00			
Noise	ص	73.14	74.18	67.55
	12:40:00			
Aircraft Movement	ص	74.47	75.88	67.1





Abobakr Vally(Final Landing) Noise Measurements				
Noise Mode	Start Time	LAeq	LAFMax	LAFMin
Background	12:30:00			
Noise	ص	68.42	69.99	68.33
	12:40:00			
Aircraft Movement	ص	74.47	75.88	67.1





New Roed For Borg Elarab Airport				
Noise Mode	Start Time	LAeq	LAFMax	LAFMin
Background				
Noise	12:55:00 ص	73.11	74.3	63.05
Aircraft	13:05:00			
Movement	AM	74.47	75.88	67.1





# Appendix 5 – Electric Consumption



Egyptian Aviation H Egyptian Airpo Borg El Arab uality & Communi	Iolding Company rts Company Int, Airport cation Department	AL A	شركة الممرية القليمة المعلمي الشرية الممسرية المطران والملاحة اليوية مطلو برج المرب السنولي إفارة اليودة والألصالات
	حتى يناير ٢٠١٢	ر القديم المدة من يناير ٢٠١٠	استهلاك الكهرباء بالمطا
القيمة		AND I WILLIAM	الشهر
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# Appendix 6 – Current Situation Photos



## <u>Traffic</u>

Four roads leading to the airport:

- 1- Al Akaria entrance
- 2- Al Kafoury road
- 3- Reconstruction axes
- 4- Coastal International Road

## Al Akaria Road Entrance























## Reconstruction road

























# Coastal International Road to airport















# Airport Entrance









## Railway crossing the road to the airport

















## Car Parking Area





## Air Quality Measurements









## Crowded Area at the Airport








## <u>Haj Hall</u>









# Road to Airport









# Solid and Hazard Waste

































## Noise measurements















# Appendix 7 – Water Quality



# Final Report Study on Quality of Drinking Water at Borg El-ARAB Airport

#### The source of drinking water

In accordance to the site visit of the environmental management of headquarter (water quality improvement department) to Borg El-Arab to evaluate and suggest the optimal solution for airport by the case of water.

#### We notice the following:

#### Water sources

The airport have been studied and found to be supplied with water through pipes of drinking water plant at kilo 26, which follow the Holding Company for Drinking Water and Sanitation in Alexandria.

One main source from water station which pumps water poured into the main ground water reservoir. To accommodate all the needs of the airport from the water used for drinking and other uses.

#### The reservoir

- 1. There is the main reservoir at the airport capacity 1630 m3 is divided into two halves with a barrier in the middle with four slots .
- 2. Water tank covered with cement and painted with epoxy resin, which inhibits the growth of fungi and algae.
- 3. Chlorine of 65% as (calcium hypochlorite) is injected in water tank to keep the level of chlorine constant about (0.5 ppm- 2ppm) is necessary to kill most of microorganisms in water
- 4. PH adjustmentalso included in water tank system which controls the (PH) in order to control the growth of bacteria and microorganisms to make sure that it produce pure water as drinkable water.
- 5. Quarantinealso takes random samples around 2 samples per month to follow up the quality of water, to show if water was compatible or not.
- 6. Cleansing the tanks is periodically every three months
- 7. There is a pumping station to pump water to the lounges, the tower, firefighter, petrol station and office building, and security of the ports building.



## Consumers of water at Borg el Arab airport

- 1. Employees
- 2. Ports Security
- 3. EAC
- 4. Egypt air airlines

## The economic cost of water consumption

- The economic cost of water consumption is high at the airport to irrigate landscape around airport.

- A small amount of water consumption is used for personal usageonly but not used for drinking water

## Estimation of water quality

- We have been studied (1) samples of drinking water fromWater stream from Terminal at Borg el Arab airport, we couldn't take more than one sample cause there was a maintenance in the water piping network .

## **RESULTS:**

• We made the physical and chemical analysis of the samples

(As shown in figure).

Analysis shows the following:

The sample is identical to the Egyptian drinking water standards in accordance with the decision of The Minister of Health no. (458) for the year 2007except;

- 1. The high proportion of fluoride is detected.
- 2. TDSis high normal According to the nature of water in Alexandria as a result of increasing the proportion of salt and it's possible that contributes to the occurrence of kidney problems for employees



#### Status of drinking water

Not good at all where that airport staff do not drink water at airports. We ask the employees to participate in a questionnaire to know to what extent this is true, and to know the consumption of water to each of them.

- From the questionnaire we have been observed that
- 1. The employees at the airport show that each of them is not safe to use water, whether for drinking or personal use.
- 2. Most of employees drink maximum about 2liter per day

Conclusion:

The amount of water consumes by each employee: 2liter/day at summer, 1liter/day at winterthus,

- 1. The average amount of drinking water of an employee per day is about =2 Literday
- 2. That means that each employee needs about 10 liter of water per day for drinking or cooking or other personal uses.

Average cost for all employees

Average economic cost of individual =Total drink of individuals / No of individuals

Then, the total cost per day for each person= $2 \times 3=6$  £e

The shift (no of days at work) is 15 days

Cost of each employee per month=  $6 \times 15=90$  £e

Cost of each employee per month  $\times$  No. of employees=

90 ×283= 25470£e

All employees cost about 25470 £e per month



The proposed solutions:

Based on water analysis it is recommended to do the following:

- 1. The installation of filters are running reverse osmosis to purify water at the administration buildings at the airport to feed the staff whereas, the number of employees about 100 person
- 2. Note that it is necessary to remove fluoride and reducing the proportions of TDS It must be installed on a separate line of the water network note that the number of employees at passenger terminal hall about 100 person.
- 3. The installation of filters are running reverse osmosis to purify water at the staff housing
- 4. There are two new buildings at Borg el Arab for staff housing
- 5. Make contract with company specializing in the field of drinking water disinfection tanks to follow up water quality and to control the disinfection of bacterial growth.

Recommendation:

The sample is identical to physical and chemical standards of Egyptian drinking water in accordance with the decision of The Minister of Health no. (458) for the year 2007.except the high range of fluoride in sample.



Test name	Offices	Unit	Max. limits		
Color	Colorless		Colorless		
Taste	Acceptable		Acceptable		
Odor	Odorless		Odorless		
Temperature	25				
РН	7.4		6.5-8.5		
Electrical conductivity	220	µs/cm			
Turbidity	0.89	NTU	1 NTU		
Total Hardness	248	mg/l	500		
Calcium Hardness	98	mg/l	350		
Magnesium Hardness	150	mg/l			
Calcium (ca ++)	44	mg/l			
Magnesium (Mg++)	0	mg/l			
Total alkalinity	175	mg/l			
Alkalinity M	180	mg/l			
Alkalinity P	5	mg/l			
Bicarbonate	170	mg/l			
Carbonate	10	mg/l			
Hydroxide		mg/l			
Sulphates (SO <sub>4</sub> )	155	mg/l	250		
Potassium(K+)	10	mg/l	10		
Chlorine(free)	0.06	mg/l			



Chlorine (Total )	0.3	mg/l	5
Chlorine (Combine )	0.24	mg/l	
Total dissolved solids	334	ppm	1000
(TDS)			
Ammonia (NH <sub>3</sub> )		mg/l	0.5
Nitrates (NO <sub>3</sub> )		mg/l	45
Silica (Si)		mg/l	
lron ( Fe)	0.01	mg/l	0.3
Manganese (Mn)		mg/l	0.4
Aluminium (Al)	0.16	mg/l	0.2
Copper (Cu)		mg/l	2.0
Zinc (Zn)		mg/l	3.0



# Appendix 8 - Air Emissions



## Source EAC Environmental data

Measurements for emissions of ground equipments



Figure (1) Ground service equipment Burj Al Arab International Airport station site

All ground equipment such as stairs, bagged cars, AC unit .....







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Numb	Kinds of Equipment	СО	CO2	NOX	
1	TC - 27				
2	TC -60	0.01	3.2	222	
3	TC - 61	0.04	3.8	25	
4	TC - 64	0.01	2.6	100	
5	TC - 65	0.01	2.5	68	
6	TC - 68	0.01	1.5	12	
7	TC -72	0.06	3.2	105	
8	TC - 104	0.04	3.3	78	
9	TC - 105				
	Total	0.18	20.1	610	

#### Table (1) represents the emissions of cars for transport luggage at the airport

## Total consumptions of fuel in the airport (diesel)

Table (2) the volume of consumption of diesel fuel to run the auto service and auto transport workers and backup power generators to the airport in 2013 (in liters / month) Consumption of vehicles at apron area for year 2013 (liter/month)

Total Consumption of Fuel (Diesel) in Airport 2013 per/Liters						
Month	Vehicles in Apron	Vehicles out Apron(1000 liter)	Elec.Generation			
January	6.825	6.26	431			
February	5.25	4.5	489			
March	6.16	4.94	530			
April	6.78	4.2	430			
Мау	7.255	4.5	575			
June	6.595	6.12	590			
July	6.485	6.4	600			
August	6.39	6.4	620			
September	7.42	7.33	580			
October	6.56	7.8	500			
November	7.335	8.55	670			
December	7.305	5.3	575			
Total	80.36	72.3	6590			



Consumption of vehicles at out the apron area (liter/month)





## Statistics about the types of planes landed at the airport

Aircraft Type	Total Flights	Percentage
Airbus	9206	74.00%
Boeing	837	6.00%
Embraer	1184	9.00%
DASH	108	0.83%
Other	9490	12.00%
Total	20825	101.83%



Year 2013 number of planes landed or takes off at the airport



## Total emissions factors for airplane movement at the airport

Total Emission Factors for All Aircrafts Movements (LTOs) 2013										
Aircraft	Total	Percentage	CO2	CH4b)	N2Oe)	NOx	СО	NMVOCs	SO2d)	Fuel
Туре	Flights									
Airbus	<i>9206</i>	74.00%	45.109	3.682	1.841	20.897	18.437	3.13	1.38	14.269
Boeing	837	6.00%	89.642	10.04	2.511	47.29	37.665	9.03	2.84	28.374
	1184	9.00%	21.312	18.94	1.184	49.728	132.608	14.2	7.1	67.488
Embraer	L								<u> </u>	
	108	0.83%	30.024	8.64	1.08	5.76	78.84	5.92	9.72	70.401
DASH	L									<u> </u>
Other	9490	12.00%	29.893	3.796	9.49	85.41	161.33	35.113	94.9	94.9
Total	20825	101.83%	215.98	45.098	16.106	209.085	428.88	67.393	115.94	275.432

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# **Appendix 9 - Solid** waste Management



## **Introduction**

This report is to provide a scientific and safe system to manage the solid wastes, to be applied in Borg El-Arab airport, taking into consideration all wastes generated from the airport including; Terminal buildings, Cafeterias, Shopping centers, Parking areas, Administrative offices, planes, Maintenance workshops and every source inside the airport.

# General structure for waste Management study in this report:

Solid Waste Management Plan

Scientific and Legislative basis Current Situation Waste Management System Predicted

Results



### The Main elements of the Waste Management System

#### **Storage:**

To contain the wastes after their generation and before their collection in a safe way for health and environment, and what is meant here is storing the wastes after generating them in different airport departments, and this can be done through many methods as; putting them in plastic bags of the same or different colors.

Or small containers from plastic or steel in front of each airport department.

And then the integrated management policy in determining all these methods and then choosing one or more after conducting Environmental, social and economic studies for each method.

#### **Collection:**

Removal of accumulated wastes from their source of generation or from a specific central collecting site and collection means collecting the wastes after their storage and this is divided into:

- The responsible agency for the collection process
- The followed way in collecting wastes as there are many ways for this, it can be collected in front of each department or in front of the roads, or from Terminal buildings, cafeterias and duty free and this system is applicable if there is a system for separating wastes and recycling them, this system is called "Disposal Sites".
- In other cases there is a special system for collecting hazardous wastes or what is called "Special Wastes".
- Number of times the housekeeping company collects waste at the airport.
- The number of workers involved in collection and their professionalism in this field.

#### Separation:

To separate useful wastes that can be reuse or recycle. And also to separate non-hazardous waste and hazardous wastes (that can't be recycled) as each type has its own way of mitigation.



### **Transportation:**

The followed way for wastes transportation from the storage site to any other place depends on many parameters; Economic or social, labors and travelers' capacity, airplanes movement or the storing method.

Because of this, choosing the right way needs complete and wide study taking into consideration each parameter.

### **Temporary Transportation:**

It is complementary transportation system to the temporary collection centers (Transfer station); as it can be transferred by means of large vehicles after that to the relatively long distances to reduce the transportation expenses.

#### **Reduction:**

Is to reduce the amount of wastes from the source or in one of the following stages:

- Reduce the quantities generated at the source.
- Redesigning the products or the means of packing to minimize the used products that result in minimizing the volume of wastes.
- Change the behavior of the use of waste voluntarily or obligatory leading to choosing the more durable materials or less waste generating.
- Work on the production of more durable materials, and portability for re-use leading to manufacturing longer life products.



### **Final Disposal:**

Final disposal of wastes by two means:

## **Dumping:**

A place for open, unorganized disposal for solid wastes. It may cause many fires, contamination of groundwater leading to damaging the workers' health.

## **Proper Land fill:**

Ground site dedicated for the disposal of solid waste in an environmentally safe manner and is designed and working in it according to the engineering assets. The wastes are put in layers and covered by inert materials, so the wastes are buried in the ground safely. And the obligatory precautions are taken either by restoring or discharging the generated gases in a safe way also in discharging or mitigating the concentration of liquid formed in a right way for water pollution sources.

## <u>Legislative and legal framework (Basic national legislation on solid waste management in</u> <u>Egypt)</u>

## First: Law No. 33 of 1667. Minister of Housing which includes the following:

- Defining solid wastes, garbage, wastes and their sources (Residential, Commercial and institutional).
- The requirements of all the solid waste that must be placed in a certain area allocated by the local council, as includes specifications for the collection, transportation and disposal of solid waste from residential areas, and commercial facilities, industrial, and public places.

## Secondly: Law No. 4 of 1664:

It includes extensive coverage on various environmental issues to be issued about it the Prime Minister the decision No. 338for the year 1995 that be issued by the executive regulations of Law No. (4), which covers many areas of environmental protection. Provision Law and the Regulations include the prohibition of open burning of waste, and requirements relating to the



construction and management including waste storage sites and covering the wastes and transport vehicles that prevent leakage and how to get rid of it in an environmentally safe way.

#### Third: Other laws related to the management of solid wastes:

- Law No. 31 of 1976sets out the garbage and solid waste, including household and industrial waste. It also identifies the use of garbage containers and means of transport and the frequency of solid waste collection.
- Law No. 106 of 1976 concerning the organization and construction / demolition waste.
- Law No. 43 of 1979 regulates the local governing body, which deals with responsibility for local officials in the field of public service.
- Law No. 3 of 1982 for urban planning, and the importance of recruiting enough spaces for public services and facilities, and hiring environmental consultants.

#### Solid waste sources in the airport

- Aircrafts.
- Passenger terminal building (arrival and departure)
- Mall.
- Administrative offices.
- Kitchens and cafeterias.
- Duty Free.
- Ground Services activities that serve the aircrafts.
- Technical and administrative stores.
- Landscape and gardens.
- Workshops.
- Airport security forces Camp.
- Facilities of private companies that provide services for the aircraft at the airport.


### **Evaluation of the current situation**

Traditionally at international airports a proportion of 40% of the solid waste and 93% of organic waste (food residue) are resulting from the different shops and shopping areas.

But the current international Borg Al Arab airport experiences a different side of objectivity. That of about 58% of the passengers who Are Using the airport are attached to the work of the Egyptian workers abroad and pilgrims from Alexandria - Cairo - Delta governorates and therefore, the culture of the passenger here play a pivotal role in waste volume and types.

Although there are different cafeterias within the halls of international travel, however the passenger does not buy from them in a normal way this is because their high prices. The demand for these cafeterias and restaurants is very restricted, and the passengers can get with them some food or drink to take during the waiting time for their trip.



Photo No. (1) a group of passengers of Borg Al Arab International Airport





Photo No. (2) Passenger of Borg Al Arab International Airport.













Photos no (3, 4, 5, and 6) show commercial area hall of international travel and the cafeterias are free of passengers

Thus, residues resulting from the airport departure halls differ from traditional waste of other airports.

Such as food residue and plastic bags and sheets of old newspapers and plastic andmetal containers with high weights which is more than any from other cafeterias or restaurants in the passenger halls.





Photo No. (7) Sample of organic solid waste resulting from the passenger terminal building at the airport.

However, the case of Borg Al Arab Airport agree completely with the other airports but in terms of size and quality of the resulting solid waste

This type of waste is a common factor in all airports in the world in terms of solid waste types generated by aircraft Consists of several elements, one of the main elements is the plastic, toilet papers, cardboards and empty plastic water bottles.

The wastes generated from aircrafts are classified by its quality and appearance as a first class and easy to be recycled.

But some of the recommendations of international and domestic legislation of some countries classified these residues as hazardous wastes but the Egyptian legislation doesn't do so.





Photo No. (8) A sample of solid waste from the aircraft Borg Al Arab International Airport.

Future airport expansions necessarily mean the expansion of the movement of aircrafts and the number of passengers, thereby doubling the number of restaurants Cafeterias and which means a steady increase in the volume of solid waste generated from Operation.

Thus, the expected size of the solid waste of the airport as a whole is in a steady increase of a peak percentage of 8% from year 2020 to an expected increase in 2030 of 15%.

Current Aircraft Movements & Forecasting				
Years	Flights	Percentage	Event	Volume of Solid Waste/tons-Year
2010	7312	Base	Base	Base
2013	25986	Base	Base	Base
2014	20825	2%	6325	136.417



 Table (1) Solid waste volume compared to the size of aircraft movement, in Borg Al Arab

 International Airport.

Total Volume of Human Waste 2014		
Source	Waste (Tone/Day)	
Terminal	2	
Parking	1.75	
Offices	1.2	
Public Cafeterias	0.5	
Total	5.45	

Table (2) Volume of Solid wastes resulting from different sources year 2024



Graph No. (1) Solid waste volume resulting from different sources on the airport in 2014



Passengers	Movement
Year 2010	712073
Year 2013	2260540
Year 2014	2021892
Year 2015	2251054
Year 2016	2486256
Year 2017	2725453
Year 2018	2930210
Year 2019	3190906
Year 2020	3449723
Total	22028107

Table No. 3 previous and the current passenger traffic and projected in Borg Al- Arab International Airport till 2020.



Graph No. (2) Previous, current and projected passenger movement for Borg Al-Arab International Airport till year 2020.





Graph No. 3 previous, current and projected passenger movement for Borg Al-Arab International Airport till 2020in percentages

# The current solid waste management in Borg Al Arab International Airport System Here are the stages of implementation of the existing confining the solid waste management system at the airport as follows:

### **First: Collection:**

Borg Al-Arab Airport is engaged to a company specialized in housekeeping and collecting solid wastes from every source in the airport without the involvement in any stage except the collection , by the means of wastes baskets in every facility in the airport the passengers put their wastes in, besides the administrative offices that generate large amount of wastes.



In this way, the housekeeping company transfers the containers to a certain place and the dispose the wastes in the temporary collection room through a metal tube reaches from the passengers halls to the collection room directly.

Or the container is fully transferred to the building exit then gets rid of the waste and replaces the container in its initial place.









Photos No (9, 10, 11) show the containers where the solid wastes are collected inside the airport.

### Second: Temporary Storage:

After the collection stage from every facility in the airport including the aircrafts. The contacting housekeeping company transfers all the wastes to the wastes' temporary collection room in the current terminal building.

Thus it provides a vehicle prepared to safely dispose all the wastes outside the airport. Where the contractor who is specialized in wastes disposal has to bury the wastes of no value in a public landfill stated by the governmental agencies in Alexandria city. Therefore the valued wastes can be recycled or sold according to the own interests.





Photo No.12 temporary assembly plant for solid waste attached to the current international terminal building in Borg Al Arab Airport from outside.





Photo No.13 shows tube reaches the terminal building to the ground floor where the assembly room of solid wastes is located.



Photo No.14 shows the assembly room of solid wastes

The ground service companies also collect wastes from aircrafts that serve it upon arrival to Borg Al-Arab international airport. And assembled in an open place in the apron area of the airport without the consideration of any environmental procedures. This is because of the absence of a temporary assembly plant for solid waste resulting from aircraft and ground service companies operating at the airport in the landing area.





Photo No.15 shows the Aircrafts and Ground services' companies wastes assembly point in the landing area of the airport.

# Forecast of air traffic and passenger movement volume and the volume of solid waste for the new project

The air and passenger traffic volume is increasing continuously; this is contrary to what was expected when establishing the current terminal building. This was designed to accommodate million passengers per year where the passenger and aircraft size in the beginning of 2011 increase to 2,800,000 passengers / year in 2014.

And when the Egyptian Airport company thought of establishing a new terminal building (with low costs) to accommodate this increase, studies were carried out by specialized agencies recommending the capacity of the new terminal building to be 4 million passengers per year besides the current number of passengers reaching a total number of passengers for Borg Al-Arab international airport of 6.800.000Steady increase in passenger numbers and aircraft using the airport, will necessarily lead to a steady increase in the potential environmental impacts of



the Borg Al Arab International Airport including increased the volume of solid waste generated by activity.

In this part of the report, we will illustrate the air and passenger traffic expected, and therefore the size of the projected solid waste from this increase and their different types.

Table No.4 shows the past, current and future passenger traffic in Borg Al-Arab International Airport till year 2024.

Current Aircraft Movements & Forecasting				
Years	Flights	Percentage	Event	Volume of Solid Waste/tons-Year
2010	7312	Base	Base	Base
2013	25986	Base	Base	Base
2014	20825	2%	6325	136.417
2015	21449	3%	1136	137.441
2016	21658	4%	1240	137.553
2017	21866	4%	1364	137.553
2018	22074	4%	1515	137.656
2019	22282	5%	1705	137.781
2020	22491	8%	2728	137.932
2021	22699	9%	3410	138.122
2022	22907	10%	3410	139.145
2023	23115	11%	3410	139.827
2024	23324	12%	4547	140.964
2025	23324	12%	4547	140.964
2026	23324	12%	4547	140.964
2027	23324	12%	4547	140.964
2028	25525	13%	5283	146.247
2029	25525	13%	5283	146.247
2030	28680	15%	8604	149.568
Total	277988	149%	30790	2385.345





Graph No.4 shows the expected increase in air traffic annually in percentage till year 2030.



Graph No.5 The estimated volume of solid wastes from operating the airport till year 2030.



Fored	asting for Total	Event Volume of Solid Waste
Year	Event /Kgs	Total Volume/Tone
2015	181	5.631
2016	181	5.631
2017	181	5.631
2018	181	5.631
2019	545	5.995
2020	545	5.995
2021	1000	6.45
2022	1000	6.45
2023	1000	6.45
2024	1000	6.45
2025	1200	6.65
2026	1200	6.65
2027	1200	6.65
2028	1500	7.1
2029	1500	7.1
2030	2000	8.45
Total	14414	102.914

Table No.5 The estimated volume of solid wastes till year 2030



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Graph No.6 The estimated volume of solid wastes till year 2030.

It is clear from our analysis of the previous maximum estimate of the Borg Al Arab International Airport in The expected amount of waste on a 2030, after the operation of the new terminal building is about 8450 tons / year.

And by reaching year 2030the total volume of wastes generated from the airport during the previous years with a total volume of 102.914 tons for 15 years from now.

The amount of waste generated is very large compared to the current volume, and therefore it should follow a completely different model from the current model based on the solid waste management system of Borg Al-Arab international Airport.

# The best proposed technique for waste management in the new project is summarized in the following elements:

### Waste collection and sorting from the source:

Where a waste containers and plastic bags with different colors are supplied and each waste has a specific color, and this kind of sorting is expected not to have very good results. It's estimated to achieve 50% only from its actual results this is due to the culture and the economical level of passengers as mentioned in the introduction of the report.

### **Temporary Storage:**

It's a must to create a comprehensive central station of solid wastes in Borg Al Arab Airport, the idea of establishing a temporary assembly room in every terminal building alone will be not effective in case of the new airport in Borg Al-Arab.

The amount and types of waste expected necessitate the Egyptian Company for the implementation of a centralized airport terminal to collect solid wastes for the airport as a whole.

This will make it easier to control and more applicable to the integrated management system.



### Sorting:

Upon the arrival of the waste to the central station (proposed) we should create a new stage in the waste management system in the airport aiming to sort every type of waste alone, That will come only through the supply and installation of sorting Equipment to sort wastes and divert them to primary products can be recycled and from these equipment:

- Waste sorting conveyor
- the detector magnet for metal
- metal piston
- chop plastic machine
- Presses for paper and board
- etc.

### Selling of Wastes:

After the completion of the previous stages in accordance with the proposal, in this case we can sell the generated solid wastes resulting from the previous operations to some of the contractors and invest in the prices.

### Safe Disposal:

In this stage we should alert the contractor to get rid of the useless wastes as organic wastes or the non-recyclable wastes in the public landfill or the proper landfill specified by the relevant authorities in Alexandria city with submitting the official documents for that.

According to this - only -proposed system, we can say that the Borg El Arab Airport follow a scientific, economic and proper environmental model in managing solid wastes from different activities.







# Appendix 10 – Vibration Measurements

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# **Instrumentation**



The 2526 Series Data Collector

System is a powerful off-line monitoring solution that comprises fast and easy data collection, innovative and versatile computer-based predictive maintenance software, and optional upgrade packages for extended Data Collector capabilities.

The 2526 MK2 and 2526E Data Collectors incorporate a choice of input capabilities

For vibration and process transducers, a multitude of measurement

Techniques and a flexible user interface that allows machine condition and alarm status to be viewed on the- spot. For hazardous environments, the 2526E Data Collector is certified intrinsically safe. Using rapidly advancing Digital Signal Processing (DSP), future enhancements



to Data Collector Systems will require no hardware changes. Optional field analysis and balancing capabilities are supplied as upgrade packages, while Brüel & Kjær CMS's range of computer-based monitoring software provides a complete system for detecting, diagnosing and trending of all kinds of vibration

### **Building vibration**

### Vibration measurements At residential area building nearest to airport

### Some reading for normal condition without any landing or take off

Point 1	
Amplitude (mm/s <sup>2</sup> )	Date
2.837	11/06/2014

Point 2	
Amplitude (mm/s <sup>2</sup> )	Date
5.197	11/06/2014

Point 3	
Amplitude (mm/s <sup>2</sup> )	Date
7.822	11/06/2014

### Point 4

Amplitude (mm/s <sup>2</sup> )	Date
4.669	11/06/2014



Spectrum frequency for that building without any landing or take off range 500 HZ



Spectrum frequency for that building without any landing or take off range 500 HZ



# Normal condition no airplane landing or take off may be this due to traffic movements of some heavy traffic

### Point 5 Plane landed

Amplitude (mm/s <sup>2</sup> )	Date
2.447	11/06/2014



### <u>Plane landed totally indicating no effect compared with first point the spectrum indicating</u> <u>normal traffic movements even it is lower than the previous one</u>

Point 6 Plane landed

Amplitude (mm/s <sup>2</sup> )	Date
2.7	11/06/2014







Point 7 Plane landed





<u>Point 8</u>
Plane landed



### Totally no effect by landing, It is a very low value for 500 Hz Range

<u>Point 9</u> Plane landed		
Amplitude (mm/s <sup>2</sup> )	Date	
1.355	11/06/2014	





It is a very low value for both 200Hz range and 500 Hz Range indicating no effect for landing



# **Overall conclusion**

- 1. The measurements indicate low vibration level at runway and at the residential area
- 2. The soil has a good abortion and damping coefficient clearly by measurements
- 3. All measured value was in acceleration terms the velocity will be much lower



### **Runway vibration**

Vibration measurements next to runway 10 meter away from edge <u>Point 1</u>

Measurement: 3 – bp Date: 11/06/2014 Time: 10:27:44







### Results

# It is a very low value for both 200Hz range and 500 Hz Range this means it will travel throw soil much less then that

Point 3	
Amplitude (mm/s <sup>2</sup> )	Date
1.182	11/06/2014



It is a very low value for both 200Hz range and 500 Hz Range





### It is a very low value for 200Hz range







# It is a very low value for 200Hz range



It is a very low value for 200Hz range













Point 10






Point	12
-------	----



Point 13

Amplitude (mm/s <sup>2</sup> )	Date
1.043	11/06/2014









Point 15







Point 16











Amplitude (mm/s <sup>2</sup> )	Date
3.51	11/06/2014







Point 18

Amplitude (mm/s <sup>2</sup> )	Date
6.418	11/06/2014









Amplitude (mm/s <sup>2</sup> )	Date
2.67	11/06/2014









Amplitude (mm/s <sup>2</sup> )	Date
3.63	11/06/2014







Point 21

Amplitude (mm/s <sup>2</sup> )	Date
3.198	11/06/2014







Point 22

Amplitude (mm/s <sup>2</sup> )	Date
3.072	11/06/2014







Point 23 landing

Amplitude (mm/s <sup>2</sup> )	Date
1.71	11/06/2014





#### Point 24 landing

Amplitude (mm/s <sup>2</sup> )	Date
3.807	11/06/2014

# Vibration measurements at 10 meter away from runway edge



## Expressed in velocity terms

Point: POINT2	
Date	Amplitude (mm/s)
11/22/2014	86.123 m





Point: POINT-.3

#### Point: POINT-.4







Point: POINT-.5

Date	Amplitude (mm/s)
11/22/2014	90.15 m





















Point: POINT8	
Date	Amplitude (mm/s)
11/22/2014	169.095 m











 Date
 Amplitude (mm/s)

 11/22/2014
 92.503 m













## Vibration measurements at Gate as a building Expressed in velocity terms







Point: POINT2	
Date	Amplitude (mm/s)
11/22/2014	95.738 m







### **Results**

#### **Conclusion for runway measurements**

- 1. The measurements was taken 10 meter way from the edge indicating a very high impact
- 2. The results for all value and for all spectrum indicate lower than expected at this location meaning the damping effects of the soil is high and soil absorb quite well vibration generated, it have a good damping coefficient.
- 3. Our focus was in low frequency range as it would expected to travel long distances
- 4. The above results indicate very low value compared with the standard ISO 4150-1-1999



**Conversion between acceleration & velocity for vibration measurements** 





# Photos for the measurements

































# Appendix 11 – Response from Road Authority



This response indicate the size and number of traffic count to airport and the Road law regarding this Roads:

Els, cczinninc JEAI/ C. me السيد الدكتور / منصور البرديس - مدير عام أم بي للأستشارات تحبة طبية ... وبعد: بالإحالة إلى الكتاب الوارد من سيادتكم بخصوص دراسة الأثر البيئي للمرحلة الثانية لمطار برج العرب الدولي ( محافظة الاسكندرية ) وطلب البيانات الخاصة بالطرق الواردة بالكتاب المذكور . نتشرف بالإحاطة بما يلى :-١) طريق محور التعمير : - جاري أعمال صيانة ورفع كفاءة الطريق قطاع ٧ ( الواصل بين الطريق الزراعي والطريق الصحراوى ) وقطاع ٨ ( الواصل من كوبري حسن علام حتى سيديكرير ) ومرفق طيه الحصر المروري للطريق. ٢) طريق مدخل العقارية طريق ( القاهرة / الإسكندرية ) الصحر اوى : جاري دراسة الطريق بمعرفة جهاز مدينة برج العرب ٣) طريق ( القاهرة / الإسكندرية ) الصحراوى : - جاري أعمال تطوير الطريق ليصير ٤ حارات في المسافه من كارفور كم ٨ حتى محطة تحصيل رسوم العامرية أسوة بباقي مسافة الطريق . وجاري حالياً در اسة أنشاء حارة لمرور الشاحنات. ٤) طريق المطار مارا بسيدي كرير : - الطريق مزدوج - حارتين مرور لكل اتجاه ( عرض الرصف ١٠ م + ٢ م طبانات ترابية ) وجارى دراسة أعمال تقوية وتغطية الطريق وتطوير الدورانات . ومرفق طيه الحصر المرورى للطريق.



) الطريق الرابط بين الطريق الساحلي ( إسكندرية / مطروح ) عند كم ٢١ وطريق ( القاهرة / الإسكندرية ) الصحراوي كم ٢٩ - ( وصلة الذراع البحري ) - جاري أعمال ترميم وتغطية هذه الوصله بطول ٧ كم.ط مزدوج ومكون من حارتين مرور بكل اتجاه . جميع الطرق التابعة للهيئة مصممه طبقا للحمو لات المرفقة وتفضلوا بقبول فائق الاحترام ،،،، 7.12/11/18 رئيس الإدارة المركزية رجاء مرفقات منطقة غرب الدلتا - بالأسكندرية  $(\vee)$ Agican) as a general "عاطف عبد الغنى "



الوقائع المصرية – العدد ١٧٨ في ٢ أغسطس سنة ٩ ٢٠٠٩ Y بيانات الحمولات المسموح المرور بها على شبكة الطرق تعليمات ١ – يحتسب الحمل على المحرر المفرد الأمامي بمقدار ٧ أطنان والمفرد الخلفي بمقدار ١٣ طنا بشرط أن يركب عليه عدد ٤ إطارات كاوتش . mn ٢ - يحتسب الحمل على المحرر المغرد 1. الأمامي للمقطورة بمقدار ١٣ طنًا بشرط أن يركب عليه عدد ٤ إطارات كاوتش . ٣ - يحتسب الحمل المكافئ على المحور Stant: المزدوج الضيق (بوجي) بمقدار ٢٠ طنًا ويشرط أن يركب على كل محور ٤ إطارات كاوتش وتكون المسافة بين المحورين أقل من ٢ متر . si n ٤ - يحتسب الحمل المكافئ على المحور الواسع (بوجي) متدار ١٣ طنًا للمحور الواحد 11: 32 وبشرط أن بركب على كل محمور ٤ إطارات كارتش . -1 ٥ - يحتسب الحمل المكافئ على المحور التلاثي (الضبق) بقدار ٣٠ طنًا وبشرط أن يركب على كل محور ٤ إطارات كاوتش . 11 ř. ٣ - يسمح بالتجارز في حدود (٥٪) من الجمولة المنقولة والمسموح المرور بها على الطرق الجناف أزاعة التسارات للتخاصطل ومنكلة اختلاب أرزان العبرات ولرن الراق allo sa su ante a trais este a

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الفائم بالحصر فحرى السبويهي



夏月

بيان الحصر المرورى طريق سيدى كرير / المطار

اليوم : الأربعاء التاريخ: ۲۰۱٤/۹/۱۰ الحصر لمده : ٤ ساعات ( إتجاه سيدى كرير )

-	اتوبيس	نقل مقطوره	نقل مفرد	١/٤نقل	ميكروباص	عربه رکوب
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دوح مصطفی ۲٫۳۰ - ۱۰	بالحصر : أ/ مم الحصر : ٣٠,	القائم فتر ہ	X		
	كرير / المطار	طريق سيدى	بر المروري	بيان الحص	
			مطار )	، ۲ عات ( إتجاه ال	الأربعاء : ۱٤/۹/۱۰ : لمده : ٤ ساء
اتوبيس	نقل مقطوره	نقل مفرد	۱/٤ نقل	میکروباص	عربه رکوپ
اتوبيس	نقل مقطور ه	نقل مفرد	۱/٤ نقل	میکروباص	عربه رکوب
١٢٠	۲۰٤	۶۳۸	۲۸ ٤	۰۰۶	۱۵۰۲
اتوپیس	نقل مقطور ه	نقل مفرد	۱/٤ نقل	میکروباص	عربه رکوب
۱۲۰	۲٥٤	٤٣٨	۲۸ ٤	۲۰۵	۱۰۰۲
اتوپيس	نقل مقطوره	نقل مفرد	۱ / ٤ نقل	میکروپاص	عربه رکوپ
١٢٠	۲٥٤	٤٣٨	٤ ۲ ٨	۵ ، ۶	۱۵۰۲
اتوبیس	نقل مقطور ہ	نقل مفرد	۱/٤نقل	میکروباص	عربه رکوب
۱۲۰	۲٥٤	٤٣٨	٤٢٨	۵، ۶	۱۵۰۲
اتوبيس	نقل مقطوره	نقل مفرد	۱/ ٤ نقل	میکروباص	عریه رکوپ
١٢٠	۲۰٤	۲۳۸ ٤	۲۸ ٤	۵، ٤	۱۵۰۲
اتوپیسن	نقل مقطور ه	نقل مفرد	1 / ٤ نقل	میکروباص	عربه رکوب
۱۲۰	۲٥٤	۲۳۸ غ	٤ ٢ ٨	۲۰۵	۱۰۰۲
اتوبيس <u>ن</u>	نقل مقطور ه	نقل مفرد	۱/ ٤ نقل	میکروپاص	عربه رکوب
١٢٠	۲٥٤	۲۳۸ ٤	٤ ۲ ۸	۶۰۵	۱۵۰۲
اتوبيس	نقل مقطوره	نقل مفرد	۱ / ٤ نقل	میکروپاص	عربه رکوپ
١٢٠	۲٥٤	۲۳۸ ٤	٤ ۲ ۸	٤،٥	۱۵۰۲
اتوبيس	نقل مقطوره	نقل مفرد	1/غنقل	میکروپاص	عربه رکوب
١٢٠	۲٥٤	۲۳۸ ٤	٤٢٨	۶۰۵	۱۰۰۲
اتوبيس	نقل مقطور ه	نقل مفرد	1 / ٤ ثقل	میکروپاص	عربه رکوب
١٢٠	۲٥٤	۲۳۸	٤ ٢ ٨	٤،٥	۱۰۰۲
اتوبيس	نقل مقطور ه	نقل مفرد	1/ ٤ نقل	میکروپاص	عربه رکوب
١٢٠	٢٥٤	۲۳۸	٤ ٢ ٨	٤،٥	۱۵۰۲
اتوبيس	نقل مقطوره	نقل مفرد	۱ / ٤ نقل	میکروپاص	عريه ركوپ
١٢٠	٢٥٤	۲۳۸	٤ ۲ ۸	٤،٥	١٥،٢
اتوبيسن	نقل مقطوره	نقل مفرد	1 / ٤ نقل	میکروباص	عربه رکوب
١٢٠	٢٥٤	۲۳۸ ٤	٤ ٢ ٨	٤،٥	۱۰۰۲



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# Appendix 12 – First Public Meeting



#### There were two announcements at the newspaper on $24\10\2014$ and $30\10\2014$



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Preparation meeting with JICA representative before the meeting starts



Full description of green technologies by a green technology expert



Description of the project by Egyptian Airports Company Engineers



Environmental Impact assessment for the project by DR. Mansour EL- Bardisi







studies are in Egypt and about his pleasure about the environmental studies implemented on Borg EL ARAB Airport

Attendants



**Conference Hall** 





People living in the area contributed in the discussion



Head of roads and bridges agency is talking about the importance of the roadways and traffic and access to the airport



Discussing the important modifications for Borg el Arab Airport



**Group Photo** 





























Some photos showing a very useful discussions with all parties



Was dated November 1st, 2014 the first public meeting to study the environmental effect of Borg Al Arab Airport in Alexandria

Main meetings hall, Africana Hotel in the Burg Al Arab and away from the airport 20 km

**Presence of:** 

No	Name	Job title	Mob. no.	Company			
1	Ahmed Nosier	Chairman & managing Director	01219898971	Hilton park group			
2	Mohamed Osman	Director general of projects and member of the board of director	01099495856	Heppner Egypt S.A.E			
3	Pilot/Gamal Shoukry	Environmental manager at EAC	01002153302	E.A.C			
4	Eng. Mohamed Alamir	مدير المتابعة والسلامة المهنية بمطار اكتوبر	01009933400	مطار اکتوبر			
5	منير البسيوني ليلة	مدير عام مؤسسة السراج المنير للتنمية( المجتمع المدنى لحماية البيئة)	01227520503				
6	طارق عبدالمنعم	نائب مدير بنك البيئة	01223301054				
7	صبر ی حلمی مجاهد	مدير عام الحماية والسلامة	01111989874				
8	محسن احمد بطيشة	رئيس مجلس امناء برج العرب	01222142047				
9	علاء عبد الحميد احمد	مدر شركة اليكتروميتالك	0122214980				
10	م/ حسن الحمامصي	مدير ادارة البيئة جهاز برج العرب	01206008080				
11	م/ عوني عبدالغني	نائب رئيس جهاز برج العرب	01222864979				
12	م/احمد ابر اهیم محمد	جهاز برج العرب	01002174967				
13	اللواء/حازم عبدالرحمن العبد	نائب الوزير والوزير التنفيذي ورئيس الجهاز المركزي للتعمير الاسبق	01006820843				
14	عادل شعبان		01227319509	E.A.C			
15	Dr.Nilly Kamal	Lead Research	01275792467	Min of internal coop			
16	Yasmin Ramdan	Economic research	01001831014	Ministry of internal coop			
17	Ahmed esmail	Environmental	01226516074	E.A.C			
-	EISA for Borg Al Arab Airport phase 2 199						



18	العمدة / عطالله مصباح		01225955755	
19	ربيع جويدة	سكان المنطقة	01009004080	
20	مطیر ابو حبیرة		01005515139	
21	على وجيه	فنى تامين سلامة طيران	01228747771	
22	هانی محمد عباس	فنى تامين سلامة طيران	01113092269	
23	م/مدحت مکاو ي	مساعد رئيس مجلس الادارة للشؤون الفنية	01227330127	
24	د/ادريس عبدالجواد	استاذ القانون الجنائي وعضو اتحاد المحامين العرب	01221303290	
25	اكرم الدقاق	Manager of EIA Alex.Gov.	01221285813	
26	حسن محمود السيد	شئون ادارية	01226318769	
27	Eng.TETSUSHI Hayakawa	Japan international cooperation agency Egypt office	01221791198	
28	Eng. Mohamed Osman	Director general of projects and member of the board director	01099495856	Heppner Egypt
29	Eng.Osama Balboul	Partner & senior vice president	01001720155	Pacer Co.
30	Mr.Kareem Abaas	Public Relation Specialist	01111454718	E.A.C
31	Mr.Mohamed Hassan Taman	Director of Public relations and media	01007080609	BORG Alarab International airports
32	Mr.Waleed Hadad	General Manager Dep.Of Japan	01005210985	ARAB REPUBLIC OF EGYPT MINISTRY OF INTERNATONAL EGYPT
33	Pilot/ Kahled Abdelsalam	Vice airport director	01002114339	E.A.C
34	Eng.Ahmed Elsayed	General manager of engineering	01027968882	E.A.C



35	Eng.Atef AbdelGhany	General Authority for roads, bridges and land transport	01143218700	وزارة النقل
36	Dr.Mansour Elbardisi	Chairman of MB consultant	01222180105	MB Consultant
37	Eng.Samah Salah	Technical Manager Engineer	01008404287	MB Consultant
38	Eng.Youssra Elshareef	Office Manager	01008404289	MB Consultant
39	Eng. Amr Mohamed	Engineer	01153911388	MB Consultant
40	Eng. Tarek Yasser	Engineer	01229931885	MB Consultant
41	MrAmr Gomaa		01222552913	E.A.C
42	Eng.Ahmed Amaar		01005416973	E.A.C
43	Mr.Mohamed magdee	Public relation and media	01229180091	BORG Alarab International airports
44	Eng.Eman		01023040020	E.A.C
45	Eng.Asmaa			E.A.C
46	Eng.Ahmed Hegazy		01208156668	
47	Dr.Ziad Kadoura	Technical Director	+966558177731	ESCO
		Environmental Studies and Consultations Office "ESCO"		



	Attendances on 1/112014 Saturday					
	No	Name	Job title	Mob. no.	@ Mail	Company
	1	(ilici) me lizilis	6/12/adora	012 9989897	11 into Ghilton Parkgraypa	Miltonpark
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1	ADEL SHAABAN	Heat of confle	01227319509	ADEL.SHAABAmeEAc- an	DAJAS
2	Dr. Nilly Kamal	Lead Kesearch	01275792	467 NKAMALMPYAHOO	con Intiles
3	Jasnin Ramadan	Elemente R.	0100/83614	Jasminramadanmic Oyaka	Honot of Jul
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14	مسحوال	· w/s' ju	JELIVIJLE		
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Attendances	on	1/112014	Saturday
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No	Name	Job title	Mob. no.	@ Mail	Company
1	Eng. Tetsushi Hayakawa	Japaninternation	d cooperation	Agency Egypt office 0122	1791198
2	Eng. MOHAMed osman	Diratorgen	eralofprojec	ts and member of the Board Direct	01099495856
3	Eng. Osama Balboul	partner 7 senio	ruice preside	+ 0601720155 pacerco	HEP prer Egypt.
4	Hr. KAreem Motamed At	bas puplic Re	lation special	st 0111454718	EAC.
5	Nr. MoHamed HassanTan	non Directo	r of puplic Re	altions and metig ologt	85609 FAC.
6	Hr. waled AL Hadad	General Man	eroep. of 1	apan 0/0052/0985	
7	pilot: Khaled ABdel sol	on vice Aig	port pirector	01002114339.01224980	EAC
86	Ahmed Elsayed	General man	ayor of Eng	invering olo27968882	E EAC.
9	Eng. Atef Abdel Gha	ry General	Authority	For roads, Bridgesand	lond Tansint
10	Dr. Mansour El Bardisi	chairmanof	MB Consution	01143218	2/00
11	Eng. sanah salah fahing	Technical E	ingineer NB (	Consultant	
12	Eng. yousna Elsmireet	office man	nger MB Gns	ultart	
13	Eng. Am Mohamed	Engineer in	MB consulta	nt 1	
14	Eng. Tarele Ahmed	Inginee	r in MB c	snoultant	
15	Eng. Amr gomaa	Engineering	AFAC.	01222552913	



#### Attendances on 1/112014 Saturday

No	Name	Job title	Mob. no.	@ Mail	Company
1	Mr. Moltamed Magdishan	tan pub	Vic Relation	Emedia 012291	80091
2	Eng. EMan			01083040020	EAC
3	Eng. Ahmed Ammar			aloo 5416973	
4	Eng. Asmaa				
5	Eng. Ahmed Hegazy		ц.	01208156668	Bolg BI Arab
6	Dr. ZIAJ kadoura			\$	
7					
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#### The meeting agenda:

- 1. The airport director's speech
- 2. Representative of the company speech
- 3. Project manager
- 4. Debate



#### Activities of the first public meeting:

The opening ceremony of the conference and make the floor through a coordinated public relations Burj Al Arab Airport and make the opening speech of the captain of the pilot / Khalid Abdul Salam Prime Tower Airport Arabs

#### Captain word pilot / Khalid Abdul Salam Prime Burj Al Arab sector

Captain pilot / Khalid Abdul offering peace with a welcome for attendance and showing a desire necessary for the project so as to achieve breakthrough air transport services in line with the steady increase of passenger traffic and the rapid growth rates of service required.

## Representative of the President of the Egyptian Company for Airports Engineer / Medhat Mekkawy

Mr. Engineer / Medhat Mekkawy welcome attendance and give thanks for the attention of those who study and gratitude for the presence of an intensification in community participation.

Mr. Major said he speaks two sides - which is the initial adjective described as an administrator and as president of the company and two o'clock epithet being secondary citizen fully aware and grateful of the importance of development

The turnout was pleased to participate and face a welcoming speech to attend general and JICA representatives and representatives of the Japanese Ministry of International Cooperation Specials also praised Ai attend tribal elders and stressed his interest in a personal capacity for the views and needs of the project.

#### Eng/ Iman elshear representative of the engineering sector company Egyptian Airports

Addressed the introduction of the project and the purpose of the development and the selected area of the new development and the general idea in the proposed design in terms of environment and conservation and concern for energy saving in terms of consumption and emissions beyond use

#### Eng / Asmaa Mohammed represented the engineering sector company Egyptian Airports

Dealt with the project description and the activities of the various buildings has a capacity planned for each of them and the development of services commensurate with the number of passengers required for the planned addition to the inclusions of different activities attendant

The speech also included "a proposal to clarify the business activities planned and the village of goods and services, import and export, as well as quarantine areas and the number of travel and arrival halls new and the number of each of them will be up to sixteen hall



## Speech of Dr. Engineer / Mansour Bardisi work Head of the study team and a representative office of Environmental Consulting

Welcome speech to attend and give staff and general idea of the project and to clarify the relationship to the environment and to explain the general meaning of a friend of the environment and, through lecture **dr. / Ziad Kaddoura** a work team member

Dealt with the idea of public design eco-friendly in all phases of the project began, "the architectural design through" design of water and sanitation and heated irrigate green spaces and storm water drainage and assembled surfaces and places with water levels low for re-use and benefit them as sources of sustainable, as well as electrical design units and special lighting low emissions Furthermore, "the design of ventilation and air conditioning units own

Lecture also addressed the benefits of eco-design in terms of cost-saving and consumption commensurate with the current energy problems and the need to create and use provided by renewable energy and sustainable

Lecture by Dr. Engineer /Mansour Bardisi head of the study team and a representative office of Environmental Consulting

Discussed all environmental and social aspects of the project

Dealt with all what have been studied previously "in addition to parts of what has been so far actually from the study in terms of the current situation of the rates of noise which have been measured in practice" various locations inside and outside the airport, as well as air emissions and dust and the components of air molecules, which have been analyzed and simulate the complete work for what will be the situation it yet development of both noise and air components

As what has been explained the brief on vibration problems, which will be one of the key elements of the study Introduction

Also it has been explained the profiles of existing water treatment plant and is separated from the chlorination and disinfection operations as well as the compilation of Garbage, which is one of the most important focal points in need of a new complete system commensurate with what the new proposal

Dr. Mansour pointed to refer to what is currently being done and what will be the overall "and not detailed," and will provide all the elements of the environmental impact study in detail through the study

Dr. Mansour initiates events debate of the General welcomed the comments of Gentlemen and listen to their views

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#### Most important discussions:

General/ Hazem el Abd,

Executive Vice-Minister and Minister and Chairman of the Central Agency for Reconstruction, former

President of the Alumni Association of the Faculty of Engineering - Alexandria University

#### President of the Association of upgrading to the environment Omranya

#### **Engineering consultant**

Mr. Major General Hazem spoke about his biography, which have a long tradition in the various national projects through the expertise of great work and different Altogether the observations noted for the importance of linking the airport road international coastal to connect the Maghreb Middle Arab through the airport as a task and the importance of the Tours also pointed to the importance of using Garbage as biofuel

#### Sheikh Atallah

#### Large tribal elders of Burj Al Arab area

Stressed the tribes full support for the project and bring full security assistance to the limits of the airport's northern and western neighboring tribes, but a request for information specifically on the progress of the problem occurring in the previous rotation of the airport on after 2000, where there is a sudden file resulting in many accidents and noted and that it is required to develop this part of the road

#### Mr. Eng / Atef Abdul Ghani

## Head of Department of the Central Authority of roads and bridges in Alexandria Governorate

Discussed the development of the planned road between the airport and through the Alexandria Cairo Desert, as well as the development of main entrance to the city of Alexandria, as well as the development of the international coastal road and raise the efficiency of the absorptive to the number of three-lane each direction to serve the cities of Ismailia and Port Said and linked to Alexandria (maritime arm) also pointed to developments Kilo 21 and Bridge reconstruction axis and is currently preparing to raise the efficiency of all the roads leading to the airport

#### Intervention by Mr. Eng / Awni Abdul Ghani vice president of Borg El Arab device

Pointed out that he went to inform the development of the interface air passages leading to the airport on the device Tower City Arabs account until kilometer 40 of the Desert entrance was put on the consulting offices



**Atef Abdel Ghani** stressed welcome collaboration and ask Dr. Mansour Bardisi work a joint meeting and workshop between roads and bridges authority of burg Al Arab city and representative of Burj Al Arab Airport and representatives of the Ministry of International Cooperation in the presence of representative of JICA Japanese to provide financial support and coordination of the full development of the road network funding leading from and to the airport

#### A comment from the Bedouin Arabs and attendance

#### Mr. / Rainy Abu Hberh

He pointed to the large number of traffic accidents and traffic on the roads leading to and from the airport due to the narrow road and the large number of drilling and the existence of a sudden curve's prior notices without him as well as to the previous rotation of the airport and the next rotation

#### Intervention of Director Mr. Ahmed engineering management burg Al Arab Airport

He pointed to the absorptive capacity and the planned number of passengers planned to get him a six million passengers and the current state of the roads and traffic flow rates disproportionately network connection with the proposed development and the desired rates

He also pointed to the need for rapid implementation of the connecting of Sidi Gaber train station to the heart of the airport because it will make the quantum leap to the level of service and speed turnout

It was agreed to add this submitted agenda for the workshop noted his previous work to develop a mechanism for the full development of the road network and the distribution of roles even though it was outside the scope of cooperation with the airport

## Intervention of Engineer / Osama Balbol president of the Board of Directors of Baser Consulting

Praised the study and emphasized the points already mentioned in the previous interventions, specifically "are:

- The need for electrical line work
- Raise the level of security in the grip areas around the airport and the airport
- Bio-fuels and the need to exploit the recycled
- Maintenance of the aircraft and protocols to be repaired

- Need to establish a plant for the processing of fruits and vegetables for storage next to the airport and to raise the efficiency of refrigeration products



Greeting and orientation of the **engineer Atef Abdel Ghani** on the efforts of the Commission required and asked him to take the car and transport distribution in mind to prolong the service life of the road

#### Intervention of Mr / Amr gomaa Egyptian Company for Airports

Specifically asked "for emissions that will be addressed in the study

**Dr. Mansour**, referring to the analytical work collectively to all the detailed elements "for each of the

NOx, SOx, CO2, CO equivalent, PM10...

We will provide full extension elaborate what has been so.

#### **Results of the Public meeting:**

1-Most attendants mentioned the need of roads improvement at the area.

2-There was a crystal clear indication for the new road between Borg Al Arab industrial area and Alex desert Road

3-All attendee accepted the project with positive attitude.

4-Road authority, Borg El-Arab authority and governorate authority attended the public meeting; they had a positive discussion about upgrading the roads



# Appendix 13 -Second Public Meeting



### First announcement Tuesday 18-11-2014

ő Januar an de d الشركة المصرية للمطارات مكتب د. منصور الدردسيي يتشرف بدعوة الجهات المعنية للمشاركة وابداء الرأى فى الجلسة الثانية والنهائية المزمع اقامتها عن تقييم الاثار البيئية والاجتماعية والاقتصادية المترتبة عن تطوير مطار برج العرب الدولى وذلك يوم الاحمم المواف ۲۰۱٤/۱۱/۲۳ بفندق رادیســون بلو الساعية العياشيرة والذصف صباحا الاسكندرية (برج العرب)

### Second announcement Thursday 20-11-2014





#### Some Photos from the Public Meeting



Different discussion and explanation at the meeting





Different discussion and explanation at the meeting





Different discussion during public meeting





Different discussions with the stakholder for borg Al Arab





Different discussions with the stakholder for borg Al Arab for road conditions



Differnt disctions with the stakholder for borg Al Arab




Differnt disctions with the stakholder for borg Al Arab& public look at the report



Different discussion and explanation at the meeting





Different speakers at the public meeting





Full explanation for the public about findings





# **The Meeting Agenda:**

- **1- Speech by Airport Manager**
- 2- Speech by Chairman of EAC
- **3- Speech by MB Consultant**
- 4- Break
- **5-Questions**

EISA for Borg Al Arab Airport phase 2 www.melbardisi.com



Today was dated November 23, 2014 second public meeting for the environmental study for Borg Al Arab International Airport

# Location hall meetings Radisson Blue Hotel 30 km from the airport

# List of the attendee

No	Name	Job title	Mob. no.	Email
1	Hany ElManshway			
2	Asmaa Youssef	Environmental Researcher	01008774358	Asmaa_thmn@yahoo.com
3	Pilot/GamalShoukry	Environmental manager at EAC	01002153302	
4	Eng. Mohamed Alamir	مدير المتابعة والسلامة المهنية بمطار اكتوبر	01009933400	
5	Ahmed Momen	Environmental Researcher		AhmedAcasang87@yahoo.c om
6	Mohamed Gamal	Environmental Researcher	01223539809	Gemy_fahmy2000@yahoo.c om
7	صبری حلمی مجاہد	مدير عام الحماية والسلامة	01111989874	
8	محسن احمد بطيشة	رئيس مجلس امناء برج العرب	01222142047	
9	Mohamed Hesham	G.M of environmental Dep.	01026610008	Mohamed_hesham
10	عادل شعبان	Head of safety and complion sector		
11	Dr.Nilly Kamal	مديرة ادارة التصميمات	01202702601	Nelly.shehafa@live.com
13	SherifAlaa	Safety Specialist	01001265070	Sheriff_hr@hotmail.com
14	عطالله		01222778930	
15	م/مدحت مكاوى		01005515139	
16	EmanKhallaaf	Environmental Inspector	01229888544	Emankhallaf@yahoo.com
17	اكرم الدقاق		01221285813	Akrameldakak2002@yahoo. com

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18	Osama Basiony		01061855589	Osama_sci@yahoo.com
		Environmental Researcher		
19	Mennatallah Salah Ahmed	Public Relation	01154149224	Kuty_manousha@yahoo.co m
20	Tamer Gamal Amin	Public Relation	01066559812	tamerasfour@yahoo.com
21	Sara Tarek Saad	Public Relation	01116920699	Sara.tarek.zaghloul@gmail.c om
22	Mr.KareemAbaas	Japan international cooperation agency Egypt office	01111454718	Kareem.moh.abbas@gmail.c om
23	Mr.Mohamed Hassan Taman	Director general of projects and member of the board director	01099495856	
24	Nourhan Adel Shabaan	HSE Specialist	01156700015	Nourhan.adelshabaan@gmai l.com
25	Hussien Mohamed Hussien		01111221951	
26	Ahmed El said			
27	Dr.MansourElbardisi	Chairman of MB consultant	01222180105	
28	Eng.Samah Salah	Technical Manager Engineer	01008404287	
29	EngAtefAbdelghany	General Authority for roads, bridges and land transport	01143218700	
30	Eng.YoussraElshareef	Office Manager		Youssraelshareef_mb@yaho o.com
31	Eng. Amr Mohamed	Engineer MB consultant		
32	Eng. Tarek Yasser	Engineer MB consultant		
33	MrAmrGomaa			
34	Dr.FaroukAbdelhay	Transportation Expert		
35	Mr.Mohamedmagdee	Public Relation EAC		



36	Menna	Public Relation EAC		
37	Eng.Asmaa			
38	Eng.AhmedHegazy	Public relation and media EAC		
39	Dr.ZiadKadoura			
39	Atef	الشركه المصريه للمطارات	0118490191	
40	Salma Hatem	Environmental Specialist		salomtylolaty@yahoo.com
41	HodaMostafa	Head of Environmental Department	01001921640	alexeeaa@gmail.com
42	Ahmed Ammar	مدير ادارة البيئه بمطار برج العرب	01005416973	Ahmed_ammar34@yahoo.co m
43	Mohamed Abdelmonem	مدير ادارة الجوده بمطار برج العرب	0123251509	
44	Eng. Ahmed Elrahim		01006633498	
45	Hany Mohamed		0143092269	
46	Ahmed Ibrahim Mohamed	معاون رئيس جهاز برج العرب	01002174967	
47	Ihab Ibrahim	شئون ادارية	01004332433	
48	Amr ElSafy	سائق مدير المطار	01228066163	
49	Mostafa Ibrahim	سائق	01226648281	
50	Hassan Mohamed	شؤون البيئه	01226218769	
51	Atta Allah		01222778920	
52	Abdelgawad		01282559662	
53	Rezk Salem			



# Copy of the attendee Signature

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The opening ceremony of the conference calls and provide through Dr. Mansour Bardisi engineer project manager

#### Pilot General / Sadek Shura Chairman of Burj Alarab Airport Speech

A welcoming speech to the audience and explained the reasons for the urgent need for the development and the necessary need for the project to overcome the constantly increased passenger traffic and the rapid growth rates of service required and the problems of the neighboring countries and the consequents of this comprehensive expansion including road network and creating many job and new opportunities and improve the various services for the people of the region.

#### Eng/ Medhat Mekawy for EAC chairman

He thanks all attendance for their present and thanks MB consultant for their speedy work and finishing the study in a short time he also mention the first public meeting comments

He also mention the need for expansion of the airport and he finished by wishing all the best for all and hope they will have a good discussions about the finding

# Engineer Dr. / Mansour Bardisi Prime of the study team and the representative of MB Consulting

Addressing all environmental and social aspects of the project

Then the discussions started and explanation in full for the finding was presented

The project is a new terminal building – environmentally friendly- by using the solar energy through the surface area not less than 12960 square meters and using new ideas in air-conditioning, lighting, water treatment, waste separation and others stated in the study

He also explained the necessity of how to take advantage of solar energy in addition to other energy sources represented in the oil and gas problems and the expected to finish in the world over 120 years and also talked to a few lighting systems with less emissions and of long-life time

Plenty of discussion was done regarding roads to airport and accident, a lot of people was involve in the discussions, stated the study is perfect and address all items including the EEAA representative



And it was explained the practical steps to measure the noise of the work of modeling inputs and outputs of the user's computer program and the expectation on the different years were also explain points and locations of measurement.

In addition to explaining the modeling of the air and the reference to the sites that have been monitoring the elements to the analyzed elements of carbonates and sulfates and particulate matter referring to taking into account the wind directions and topographic and current emission sources

During the discussions the MB experts for Road explained in details the current situation and the expected impact

Finally Eng Atef head of the bridge authority clearly stated the following

- 1. He explain his satisfaction of the study findings
- 2. He stated the authority will start immediately the study needed for the road from north coast road to airport and apply the engineering solution
- 3. He will study all crossing to the airport and find the best solution for this crossing
- 4. He stated that there will be a renovation of Al Tamer Road very shortly
- 5. He stated that there will be a bridge over the Rail way crossing the road to airport and the expenses will be by his authority
- 6. He also stated that the new proposed road between Alexandria desert road and the airport will be renovated as MB suggested
- 7. There will be a discussion with the authority for Alexandria desert road to build a new flay over at the Al Akaria road entrance to airport

### **Conclusions**

- 1. All attendance have a very positive response about the airport and the study
- 2. It is very clear that the response by the road and bridge authority in the area will minimize the negative impact of the project