

Ing. Enrique Mejía M.
Gerente de Calidad del Agua
CONAGUA
Ave. Insurgentes Sur No. 2416
Col. Copilco – El Bajo
Del. Coyoacán CP 04340
Ciudad de México,
México

Subject: Summary of MITRE's Aeronautical Assessment of the *Centro de Gestión de Residuos Sólidos en el Bordo Poniente*

Dear Ing. Mejía:

The MITRE Corporation (MITRE) is supporting Grupo Aeroportuario de la Ciudad de México (GACM) and the aviation authorities of Mexico's federal government in the development of a new airport, hereafter referred to in this document as Nuevo Aeropuerto Internacional de la Ciudad de México (NAICM), which will serve Mexico City and replace the current Aeropuerto Internacional de la Ciudad de México (AICM). As part of that support, MITRE is often asked to investigate the potential impact of proposed development (e.g., construction of buildings and facilities) in the vicinity of NAICM, and provide feedback on aeronautical matters to GACM and the aviation authorities to help inform them in their decision-making process.

On 20 April 2017, you visited MITRE to discuss the proposed development of *Centro de Gestión de Residuos Sólidos en el Bordo Poniente* (hereafter referred to as the "facility"), which is to be constructed near NAICM and AICM. During that visit, you provided valuable information and feedback on the construction of the facility. Additionally, MITRE agreed to provide you with the key results of its aeronautical assessment of the facility on operations at NAICM and AICM. Therefore, the objective of this document is to provide you with a high-level summary of MITRE's assessment of the facility and key results, and to inform you of MITRE's overall opinion on the best locations for the facility from an aeronautical perspective.

Background

In response to a high-priority request in the autumn of 2016 by Lic. Yuriria Mascott, Undersecretary of Transportation, and CTA. Miguel Peláez, Director-General of the Dirección General de Aeronáutica Civil (DGAC), MITRE designated a team of experts to

assess the potential impact of the above-mentioned facility on future operations at NAICM and existing operations at AICM. As part of its assessment, MITRE recommended that at least one major airline, which currently operates at AICM, conduct an independent analysis of the facility (at all proposed locations) in order to determine if there would be any adverse impacts (e.g., restriction of aircraft payload and range capabilities) to takeoff practices and procedures for aircraft experiencing an engine failure during departures from NAICM or AICM. Therefore, at the request of CTA. Peláez, the MITRE team compiled relevant information needed by Aeroméxico to conduct the appropriate takeoff performance analysis. Upon Aeroméxico's completion of the takeoff performance analysis, the MITRE team reviewed the results and provided CTA. Peláez with MITRE's feedback and a complete and final opinion. The Undersecretary of Transportation was duly copied.

Key Considerations and Results

MITRE was presented with various options for the location of the facility, which included what were called Options 3, 4.1, 4.2, and 5. Initially MITRE was told that the smokestacks were going to be about 80-meter-high. This was too high and, as a result, the facility designers changed this to 40 meters. Therefore, for analytical purposes, MITRE considered 40-meter-high smokestacks at each of the proposed facility locations.

Per analyses already reported by MITRE, smokestacks at the proposed facility locations do not appear to be physical obstacles to normal instrument approach and departure procedures at either NAICM or AICM.¹ However, as mentioned above, there are concerns that the smokestacks could affect takeoff performance under an engine-failure situation. Therefore, Aeroméxico conducted a takeoff performance analysis to determine at what distance from the departure end of each runway at NAICM and AICM, 40-meter-high smokestacks would cause an operational problem, such as a reduction in takeoff weight resulting in reduced distance that could be flown and/or passengers or cargo that could be carried.

Based on the data provided by Aeroméxico, which took into account the 40-meter-high smokestacks and other specifications provided by MITRE, it was determined that should Option 5 be selected, the airlines and Servicios a la Navegación en el Espacio Aéreo Mexicano (SENEAM) need to ensure that takeoff procedures from AICM turning toward Option 5 are preventable.²

¹ Per Enclosure 1 to MITRE Technical Letter F500-L17-030, dated 11 January 2017 delivered to GACM and DGAC.

² Per MITRE Technical Letter F500-L17-053, dated 7 April 2017 delivered to GACM and DGAC.

MITRE's Opinion on the Options for the Facility Location

Based on MITRE's aeronautical assessment of the proposed options for the facility location, as well as the results of Aeroméxico's takeoff performance analysis, MITRE's overall opinion is as follows:

- Options 4.1 and 4.2 are located the farthest away from the extended centerlines of any of the NAICM runways and are also located far from AICM. These options clearly constitute the best ones to build the facility from an aeronautical perspective.

Figure 1 shows the location of Option 4.1 and Table 1 shows its coordinates, based on World Geodetic System 1984 (WGS 84). The elevation of 40-meter-high smokestacks at Option 4.1 would be **2264.43 meters above Mean Sea level (MSL)**.³

Figure 2 shows the location of Option 4.2 and Table 2 shows its coordinates, based on WGS 84. The elevation of 40-meter-high smokestacks at Option 4.2 would be **2263.82 meters MSL**.

- Option 5 is located closest to AICM. In that respect, this option is not preferred over Options 4.1 or 4.2. Of the options being considered, it is the next best option to locate the facility. However, as mentioned above, if Option 5 is to be selected, the airlines and SENEAM need to ensure that turning aircraft toward Option 5 is preventable.

Figure 3 shows the location of Option 5 and Table 3 shows its coordinates, based on WGS 84. The elevation of 40-meter-high smokestacks at Option 5 would be **2273.00 meters MSL**.

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³ Ground elevation information for each option was provided to MITRE by the DGAC.



Figure 1. Options 4.1

Table 1. Coordinates for Option 4.1

Point	WGS 84 Coordinates		WGS 84 UTM 14N Coordinates	
	Latitude (N)	Longitude (W)	X	Y
1	19° 28' 06.98"	098° 56' 53.73"	505430.3798	2152679.7607
2	19° 28' 10.89"	098° 56' 27.81"	506185.9916	2152800.1860
3	19° 27' 50.81"	098° 56' 24.95"	506269.5838	2152183.0142
4	19° 27' 45.27"	098° 56' 55.68"	505373.7296	2152012.4419



Figure 2. Option 4.2

Table 2. Coordinates for Option 4.2

Point	WGS 84 Coordinates		WGS 84 UTM 14N Coordinates	
	Latitude (N)	Longitude (W)	X	Y
1	19° 27' 43.01"	098° 56' 56.52"	505349.2605	2151942.9688
2	19° 27' 48.16"	098° 56' 25.38"	506257.0758	2152101.5566
3	19° 27' 25.77"	098° 56' 23.41"	506314.7504	2151413.3739
4	19° 27' 19.97"	098° 57' 01.84"	505194.3625	2151234.7420



Figure 3. Option 5

Table 3. Coordinates for Option 5

Point	WGS 84 Coordinates		WGS 84 UTM 14N Coordinates	
	Latitude (N)	Longitude (W)	X	Y
1	19° 26' 09.04"	99° 01' 35.19"	497224.3397	2149054.0282
2	19° 26' 14.07"	99° 01' 25.62"	497503.4209	2149208.6030
3	19° 26' 05.96"	99° 01' 20.83"	497643.0536	2148959.3051
4	19° 25' 59.52"	99° 01' 28.47"	497420.2508	2148761.3883
5	19° 26' 01.40"	99° 01' 32.67"	497297.7856	2148819.1892

Please do not hesitate to contact me if you have any questions.

Sincerely,

Ing. Robert W. Kleinhans
Project Technical Coordinator

cc:
Dr. Bernardo Lisker, MITRE