MITRE

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F500-L14-032

CTA. Félix Rodolfo Olivares Castro
Director General Adjunto de Tránsito Aéreo
Servicios a la Navegación en el Espacio Aéreo Mexicano (SENEAM)
Avenida 602, Número 161
Zona Federal AICM
Delegación Venustiano Carranza
15620 México, D.F.
México

Subject: Summary of Key Feedback Provided by SENEAM Experts

Dear CTA. Olivares:

I would like to take this opportunity to thank you for supporting the 5 June 2014 visit to MITRE by CTA. Rodrigo Bruce Magallón and CTA. José Arturo Enríquez. The visit included a full-day of detailed presentations and discussions regarding MITRE's previous Nuevo Aeropuerto Internacional de la Ciudad de México (NAICM) airspace work, as well as its recent Hidalgo-and Santa Lucía Military Base (Santa Lucía)-related aeronautical studies. Their visit was of critical importance in order to obtain important aeronautical-and Air Traffic Control (ATC)-related feedback.

Appendix A to this letter shows the agenda, which lists the main activities that were conducted during their visit to MITRE. CTAs Magallón and Enríquez both provided excellent feedback throughout the day.

The following is a brief summary of key results during the meetings:

- **Potential Airport Sites at Hidalgo**:

  The discussions regarding the potential airport sites in Hidalgo were extremely productive. The most important item to mention here is that following a full-day of technical presentations and discussions, both teams (SENEAM's and MITRE's), agreed on the same order of site preference, following a "blind", separate analysis based on a strictly an air navigation point of view.

  The preliminary order of site preference was:

  1. Tulancingo
  2. Tepeji del Río – Runway Option 1 (north-south oriented runway)
  3. Tepeji del Río – Runway Option 2 (northeast-southwest oriented runway)
  4. Zempoala
  5. Apan

CTAs Magallón and Enríquez made the MITRE team aware of the likely need for additional requirements and resources if an airport was to be constructed at Apan, such as the installation of an Airport Surveillance Radar (ASR) at Puebla Airport, which could be required if a new airport was constructed at Apan (which would probably also require its own ASR) in order to potentially handle airspace conflicts between the two airports.

Appendix B to this letter shows the preliminary boundary areas of the potential airport sites in Hidalgo discussed by MITRE with CTAs Magallón and Enríquez.

- **Helicopter Operations within Santa Lucía in Conjunction with NAICM Operations**:

  MITRE discussed and presented its analysis of the potential for Fuerza Aérea Mexicana (FAM) Visual Flight Rules (VFR) helicopter arrival and departure operations within Santa Lucía, coexisting with operations at NAICM. The objectives of this analysis were to determine whether those helicopter operations can be operated independently from operations at NAICM, as well as what restrictions would need to be placed on helicopter operations to avoid capacity-limiting airspace interactions.

  Appendix C to this letter shows the lateral dimensions of various sectors of airspace around NAICM and Santa Lucía, and the maximum permissible altitude within the sectors where VFR helicopters could potentially be allowed to operate safely. CTAs Magallón and Enríquez were in overall agreement with MITRE's findings. Other areas where helicopter arrival and departure operations could *potentially* be conducted may be considered and analyzed (e.g., farther north and east of Santa Lucía).

- **Helicopter Routes Between NAICM and Santa Lucía**:

  MITRE discussed and presented its analysis of the potential for developing low altitude VFR helicopter routes between Santa Lucía and NAICM. The objectives of this analysis were to determine whether FAM helicopter operations on those routes can be operated independently from operations at NAICM, as well as what restrictions and potential requirements would need to be considered.

  Per Appendix D to this letter, two potential helicopter routes were developed: an East and a West VFR Helicopter Route. CTAs Magallón and Enríquez were also in overall agreement with MITRE's work on this subject.

On a different subject, I would like to remind you that per DGAC's request in late April, you were going to pass on to Dr. Bernard Lisker a contact within SENEAM in order to coordinate the shipping of the advanced air traffic controller training prototype for Mexico. The device has been basically ready to be shipped shortly since after the time when the Mérida/Cancún SENEAM experts visited MITRE. Please let me know as soon

as possible whether there is any administrative problem with this request, as MITRE needs to send within the next few days an update to the DGAC.

Thank you again for your support and please do not hesitate to contact me if you need any clarification or any other assistance.

Sincerely,

Ing. Robert W. Kleinhans
Project Technical Coordinator

cc:

Ing. Claudio Arellano, SENEAM
Lic. y P.A. Gilberto López Meyer, ASA
Dr. Bernard Lisker, MITRE

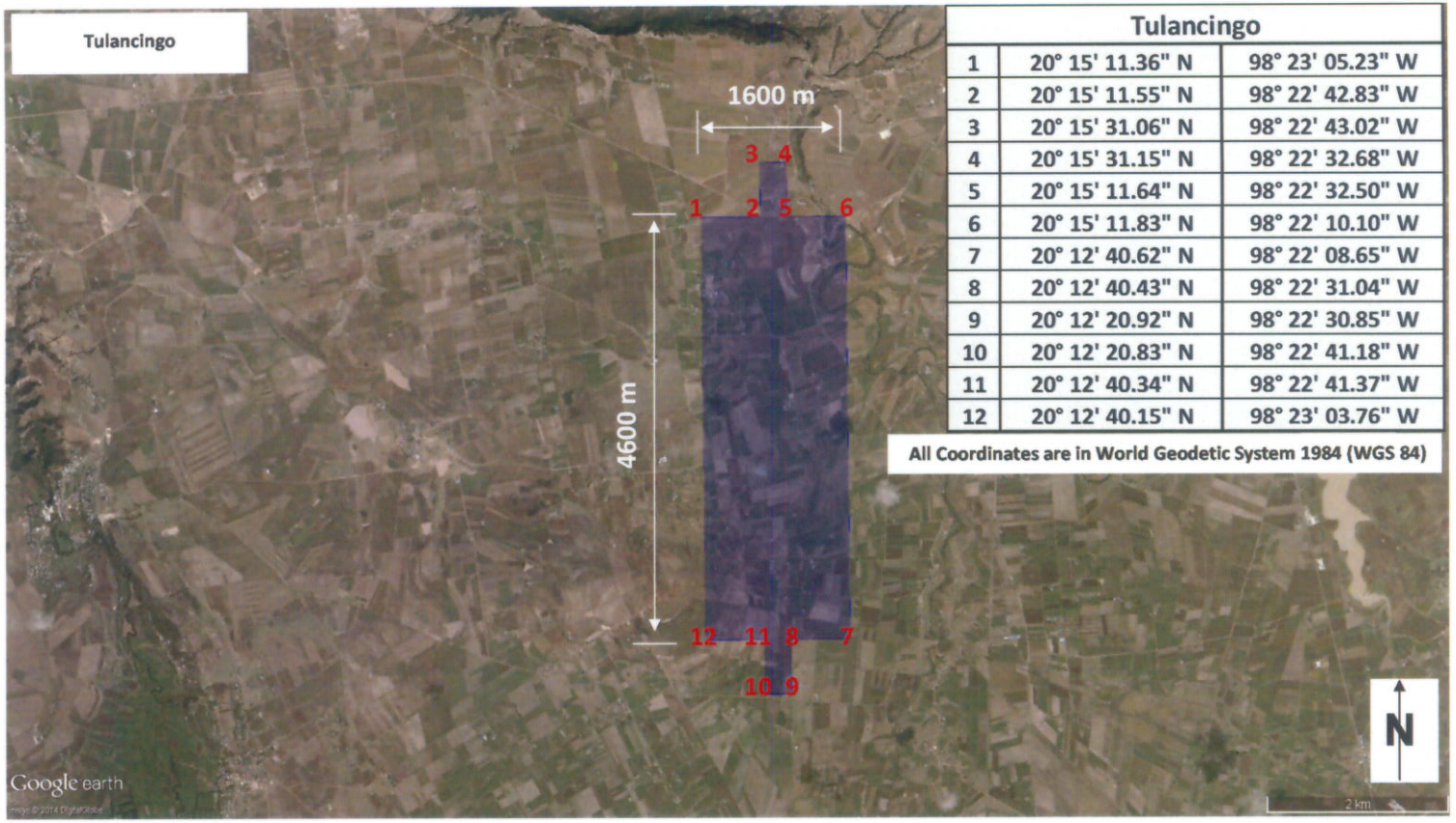
Appendix A

Figure A-1 shows the agenda used during the 5 June 2014 visit to MITRE by CTA. Magallón and CTA. Enríquez of SENEAM.

Figure A-1. Agenda for 5 June 2014 Visit to MITRE by Experts from SENEAM

Appendix B

Figures B-1 through B-5 show the dimensions and coordinates of the boundary areas of potential airport sites in Hidalgo being considered and examined by MITRE. **The information is preliminary and subject to change.**



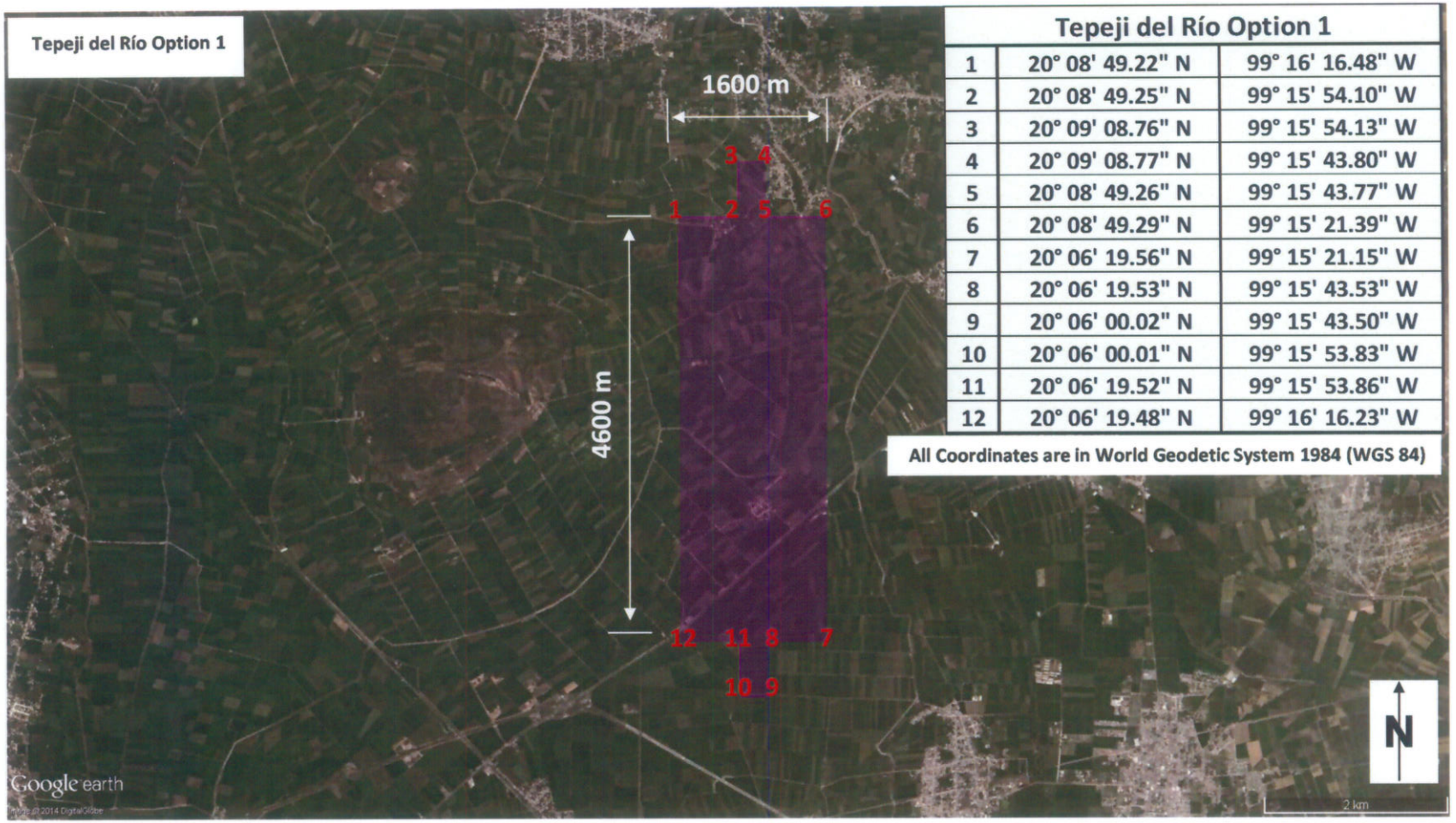
Tulancingo		
1	20° 15' 11.36" N	98° 23' 05.23" W
2	20° 15' 11.55" N	98° 22' 42.83" W
3	20° 15' 31.06" N	98° 22' 43.02" W
4	20° 15' 31.15" N	98° 22' 32.68" W
5	20° 15' 11.64" N	98° 22' 32.50" W
6	20° 15' 11.83" N	98° 22' 10.10" W
7	20° 12' 40.62" N	98° 22' 08.65" W
8	20° 12' 40.43" N	98° 22' 31.04" W
9	20° 12' 20.92" N	98° 22' 30.85" W
10	20° 12' 20.83" N	98° 22' 41.18" W
11	20° 12' 40.34" N	98° 22' 41.37" W
12	20° 12' 40.15" N	98° 23' 03.76" W

All Coordinates are in World Geodetic System 1984 (WGS 84)

Source: Google Earth

Note: Use this information carefully, as it is preliminary and subject to change.

Figure B-1. Tulancingo



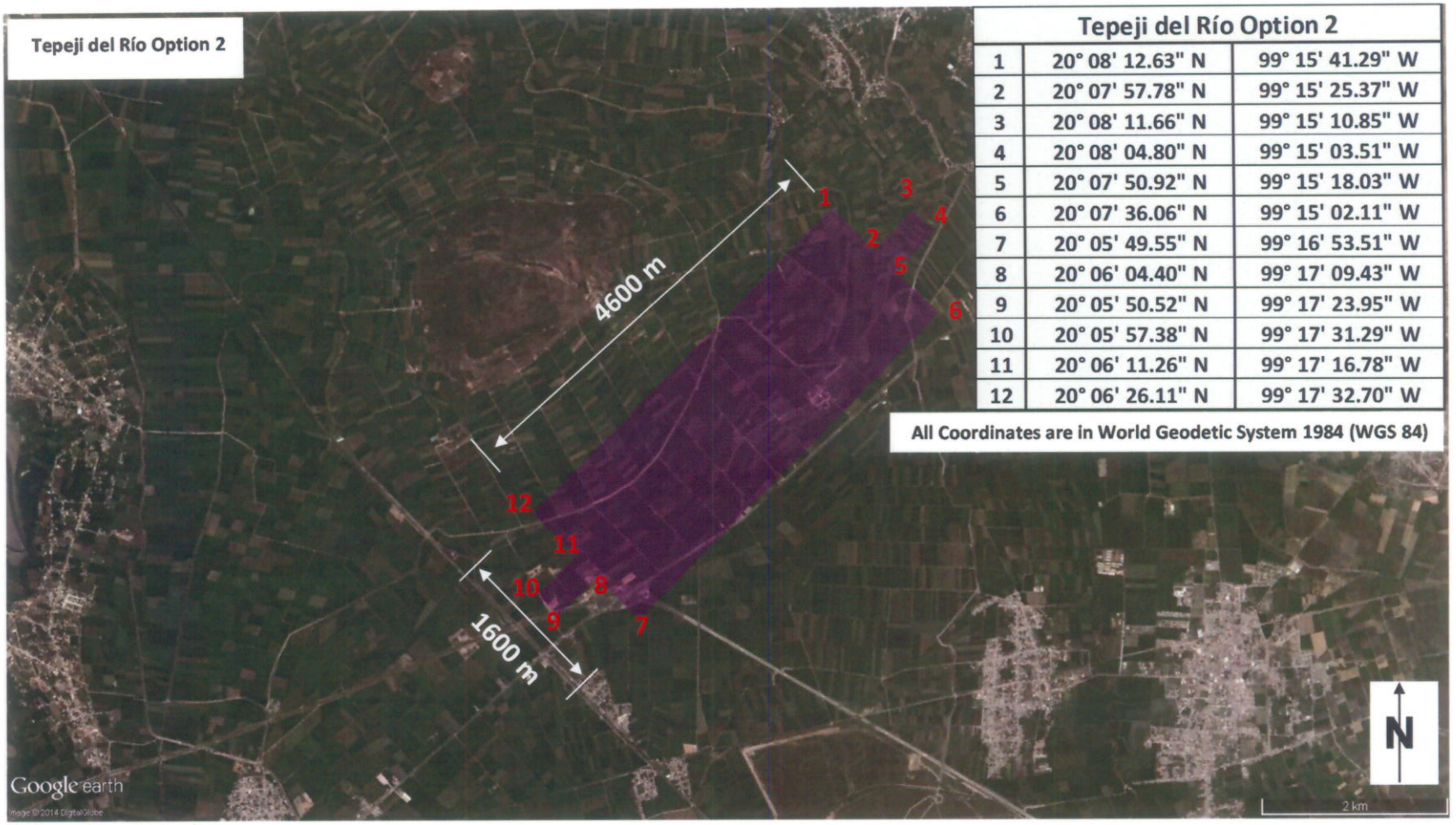
Tepeji del Río Option 1		
1	20° 08' 49.22" N	99° 16' 16.48" W
2	20° 08' 49.25" N	99° 15' 54.10" W
3	20° 09' 08.76" N	99° 15' 54.13" W
4	20° 09' 08.77" N	99° 15' 43.80" W
5	20° 08' 49.26" N	99° 15' 43.77" W
6	20° 08' 49.29" N	99° 15' 21.39" W
7	20° 06' 19.56" N	99° 15' 21.15" W
8	20° 06' 19.53" N	99° 15' 43.53" W
9	20° 06' 00.02" N	99° 15' 43.50" W
10	20° 06' 00.01" N	99° 15' 53.83" W
11	20° 06' 19.52" N	99° 15' 53.86" W
12	20° 06' 19.48" N	99° 16' 16.23" W

All Coordinates are in World Geodetic System 1984 (WGS 84)

Source: Google Earth

Note: Use this information carefully, as it is preliminary and subject to change.

Figure B-2. Tepeji del Río Option 1



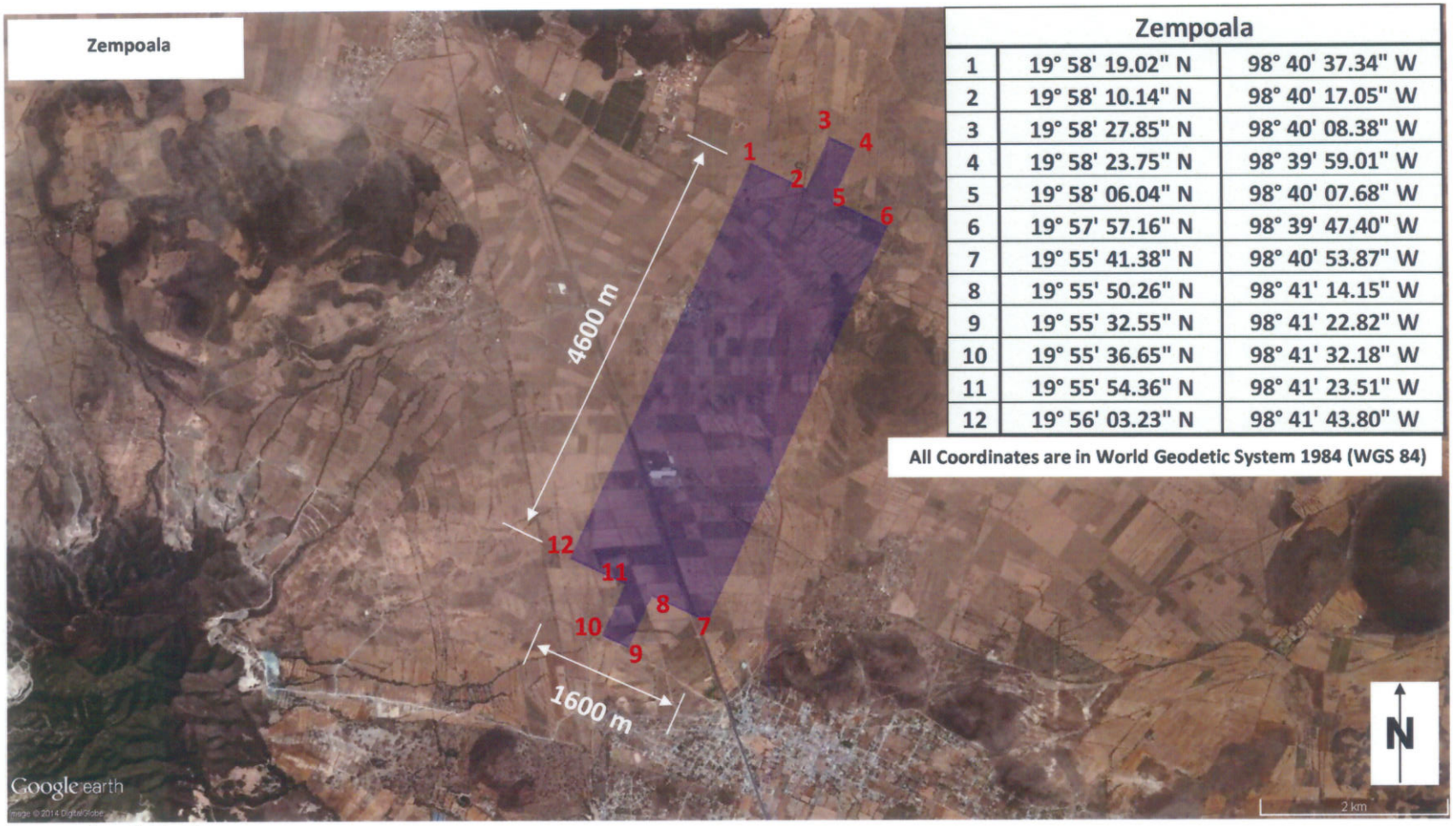
Tepeji del Río Option 2		
1	20° 08' 12.63" N	99° 15' 41.29" W
2	20° 07' 57.78" N	99° 15' 25.37" W
3	20° 08' 11.66" N	99° 15' 10.85" W
4	20° 08' 04.80" N	99° 15' 03.51" W
5	20° 07' 50.92" N	99° 15' 18.03" W
6	20° 07' 36.06" N	99° 15' 02.11" W
7	20° 05' 49.55" N	99° 16' 53.51" W
8	20° 06' 04.40" N	99° 17' 09.43" W
9	20° 05' 50.52" N	99° 17' 23.95" W
10	20° 05' 57.38" N	99° 17' 31.29" W
11	20° 06' 11.26" N	99° 17' 16.78" W
12	20° 06' 26.11" N	99° 17' 32.70" W

All Coordinates are in World Geodetic System 1984 (WGS 84)

Source: Google Earth

Note: Use this information carefully, as it is preliminary and subject to change.

Figure B-3. Tepeji del Río Option 2



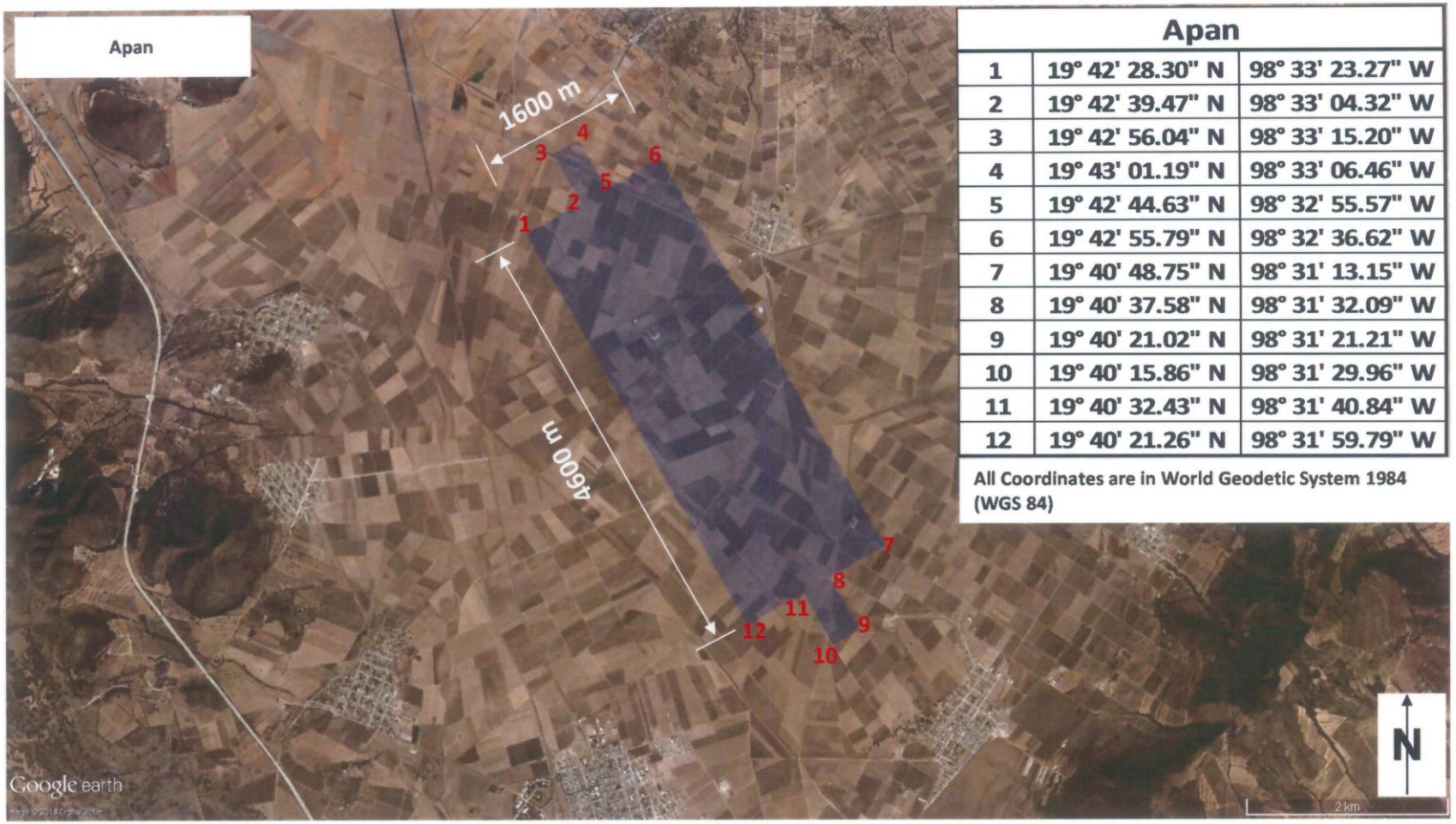
Zempoala		
1	19° 58' 19.02" N	98° 40' 37.34" W
2	19° 58' 10.14" N	98° 40' 17.05" W
3	19° 58' 27.85" N	98° 40' 08.38" W
4	19° 58' 23.75" N	98° 39' 59.01" W
5	19° 58' 06.04" N	98° 40' 07.68" W
6	19° 57' 57.16" N	98° 39' 47.40" W
7	19° 55' 41.38" N	98° 40' 53.87" W
8	19° 55' 50.26" N	98° 41' 14.15" W
9	19° 55' 32.55" N	98° 41' 22.82" W
10	19° 55' 36.65" N	98° 41' 32.18" W
11	19° 55' 54.36" N	98° 41' 23.51" W
12	19° 56' 03.23" N	98° 41' 43.80" W

All Coordinates are in World Geodetic System 1984 (WGS 84)

Source: Google Earth

Note: Use this information carefully, as it is preliminary and subject to change.

Figure B-4. Zempoala



Apan		
1	19° 42' 28.30" N	98° 33' 23.27" W
2	19° 42' 39.47" N	98° 33' 04.32" W
3	19° 42' 56.04" N	98° 33' 15.20" W
4	19° 43' 01.19" N	98° 33' 06.46" W
5	19° 42' 44.63" N	98° 32' 55.57" W
6	19° 42' 55.79" N	98° 32' 36.62" W
7	19° 40' 48.75" N	98° 31' 13.15" W
8	19° 40' 37.58" N	98° 31' 32.09" W
9	19° 40' 21.02" N	98° 31' 21.21" W
10	19° 40' 15.86" N	98° 31' 29.96" W
11	19° 40' 32.43" N	98° 31' 40.84" W
12	19° 40' 21.26" N	98° 31' 59.79" W

All Coordinates are in World Geodetic System 1984 (WGS 84)

Source: Google Earth

Note: Use this information carefully, as it is preliminary and subject to change.

Figure B-5. Apan

Appendix C

Figure C-1 shows the lateral dimensions of various sectors of airspace around NAICM and Santa Lucía, and the maximum permissible altitude within the sectors where Santa Lucía VFR helicopters could potentially be allowed to operate safely. Refer to enclosure No.1 to MITRE technical letter F500-L14-022 for details regarding this work, including key assumptions and limitations.

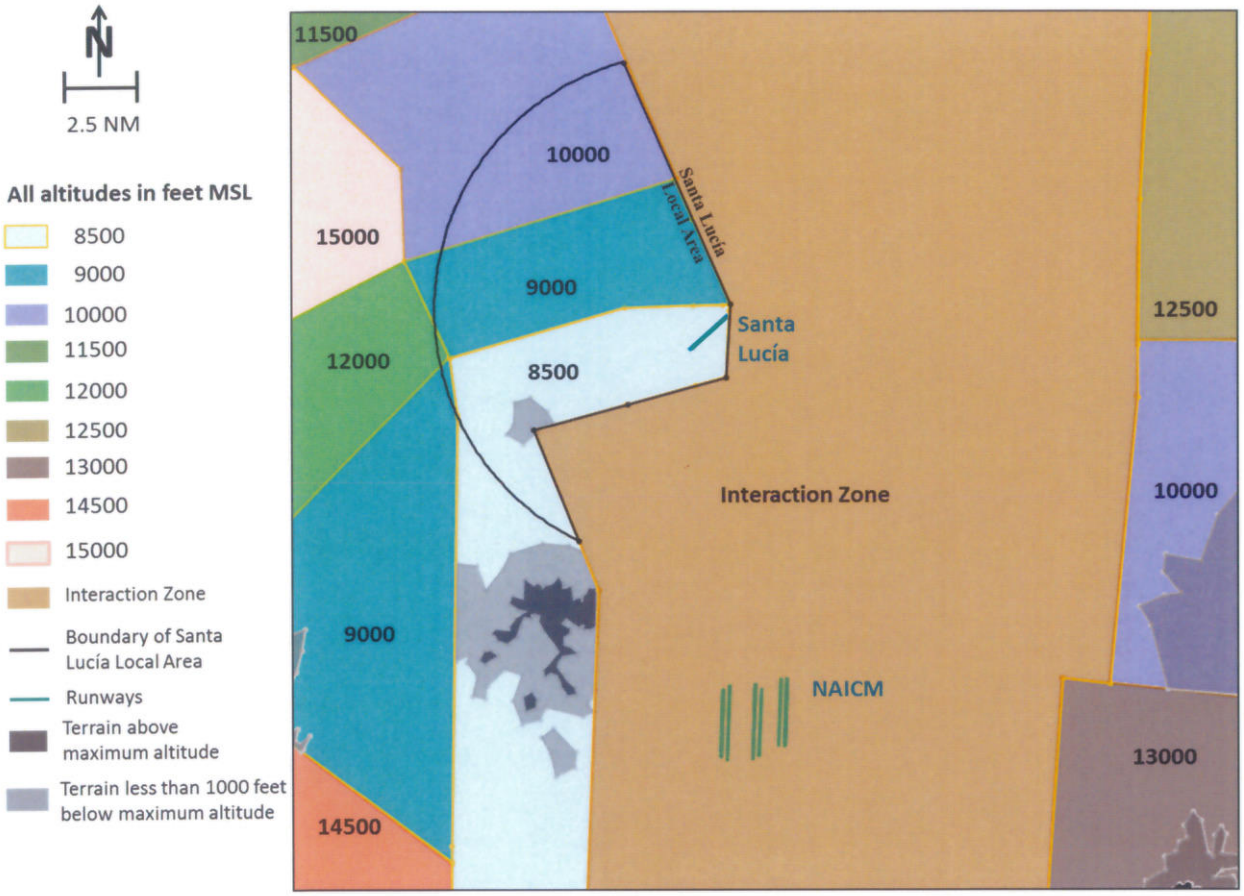
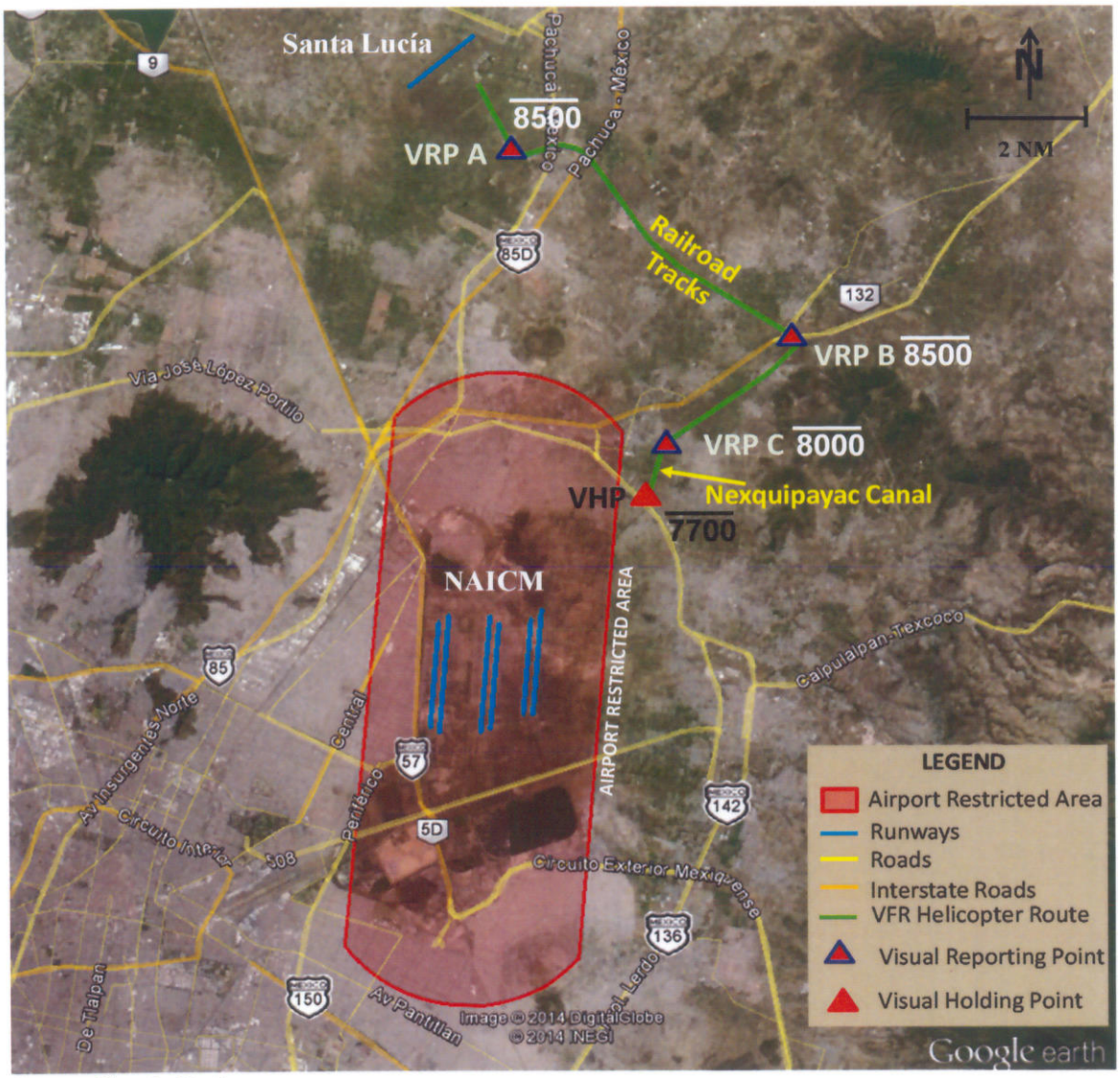


Figure C-1. Preliminary VFR Helicopter Airspace Sectors and Altitudes (with terrain penetrations)

Appendix D

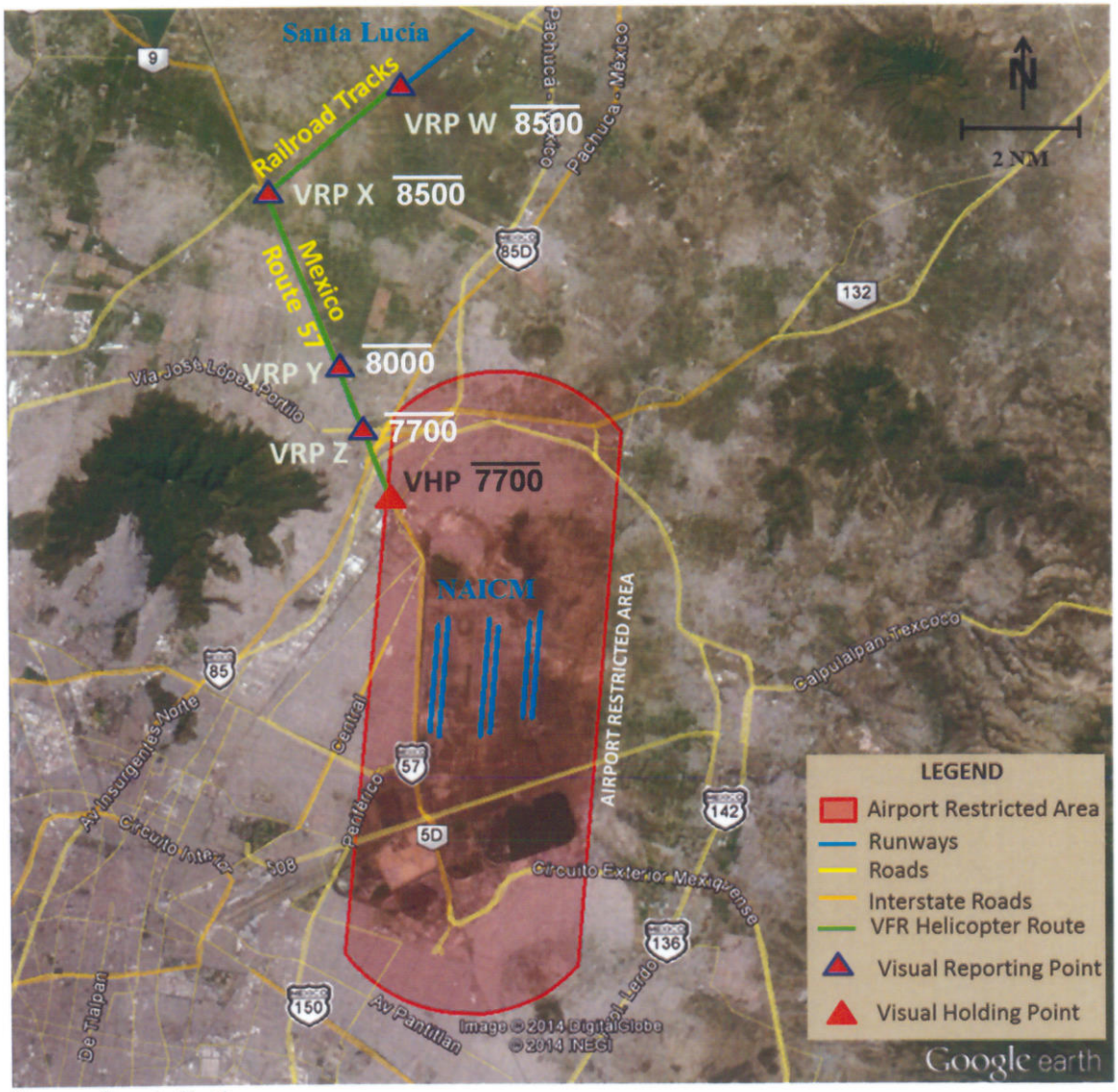
Figures D-1 and D-2 show the East VFR Helicopter Route and the West VFR Helicopter Route, respectively. Refer to enclosure No.1 to MITRE technical letter F500-L14-033 for details regarding this work, including key assumptions and limitations.



Source: Google Earth

Note: The altitudes shown next to each Visual Reporting/Holding Point indicate the maximum permissible operating altitude along the routes (i.e., "Not above" altitudes). These altitudes are in feet above Mean Sea Level.

Figure D-1. Preliminary East VFR Helicopter Route



Source: Google Earth

Note: The altitudes shown next to each Visual Reporting/Holding Point indicate the maximum permissible operating altitude along the routes (i.e., "Not above" altitudes). These altitudes are in feet above Mean Sea Level.

Figure D-2. Preliminary West VFR Helicopter Route