Enclosure 3

(Ref. Technical Letter F500-L14-033)

MITRE

Center for Advanced
Aviation System Development

Photogrammetric, Satellite-Based Survey of the Texcoco Area and Its Surroundings

Satellite Image Acquisition Completion Report

MITRE is responsible for the procurement of a satellite-based photogrammetric survey of the Texcoco area and its surroundings. MITRE is pleased to report that all of the satellite-based imagery required to conduct the survey have been successfully acquired. More importantly, the images were acquired without clouds.

This enclosure provides a report that was prepared by MDA Geospatial Services Inc. (MDA), the company performing the survey, which describes the satellite image acquisition areas, specifications, as well as illustrations of the satellite images that were acquired of the Texcoco area and its surroundings.

Prepared for

Aeropuertos y Servicios Auxiliares

June 2014

Photogrammetric, Satellite-Based Survey of the Texcoco Area and Its Surroundings: Satellite Image Acquisition Completion Report

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Table of Contents

List of Figures

List of Tables

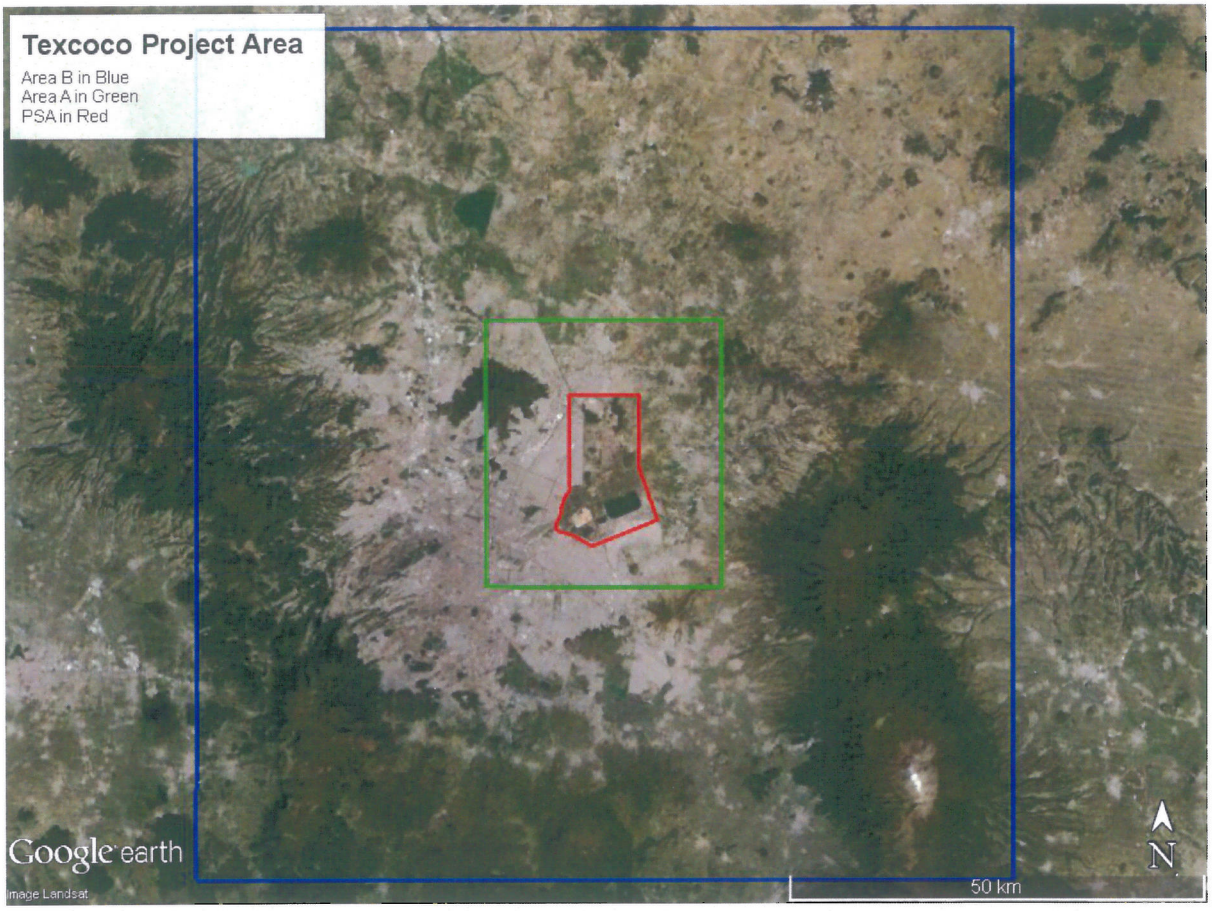
Acronyms

ASA	Aeropuertos y Servicios Auxiliares
GCPs	Ground Control Points
GSD	Ground Sampling Distance
MDA	MacDONALD, DETTWILER AND ASSOCIATES LTD.
MITRE	The MITRE Corporation
PSA	Photogrammetric Survey Area
WGS84	World Geodetic System 1984
UTM	Universal Transverse Mercator

1 Introduction

The Satellite Image Acquisition Completion Report provides a complete list of the satellite images acquired for the Project that cover the Project Areas.

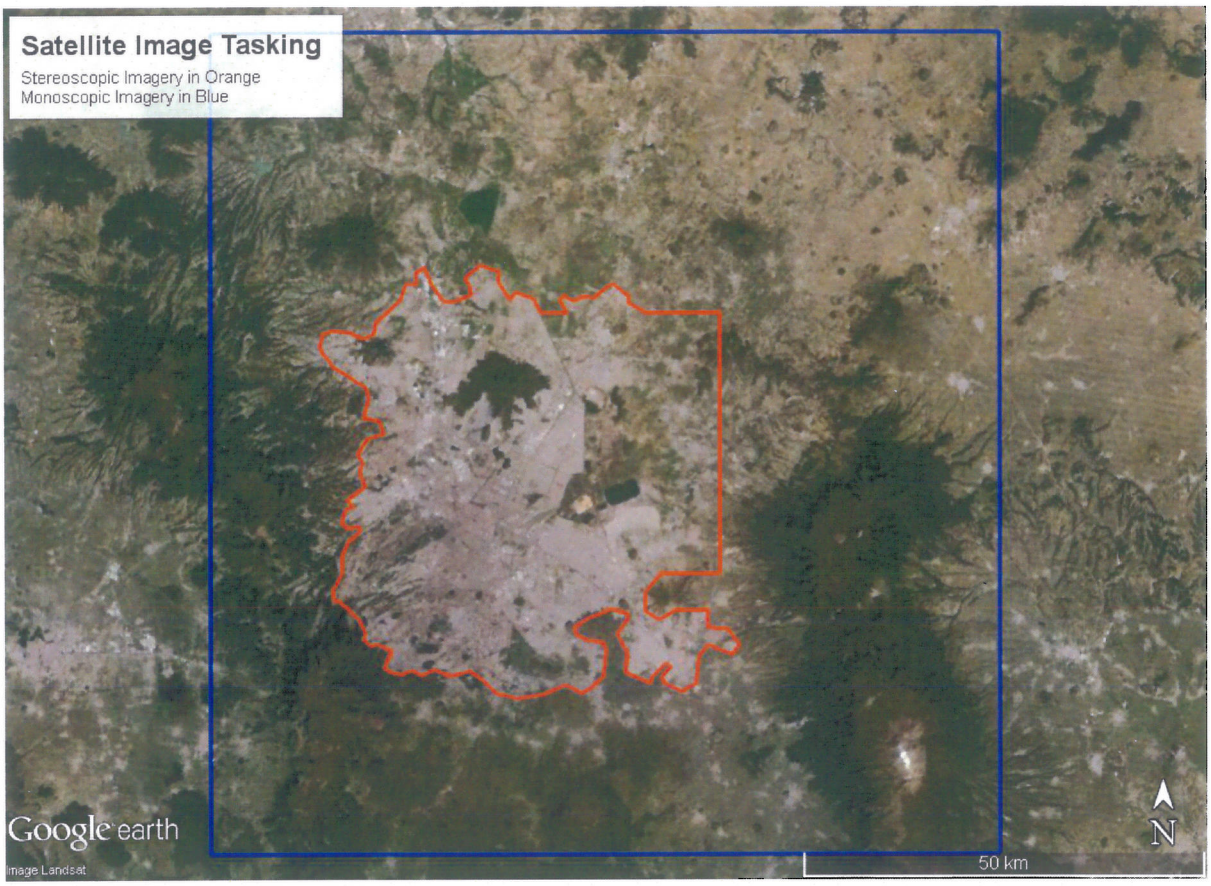
The project titled the Photogrammetric, Satellite-Based Survey of the Texcoco Area and Its Surroundings (hereafter referred to as the "Project") began on 17 March 2014. The survey will be used to support The MITRE Corporation (hereafter referred to as "MITRE") in conducting aeronautical analyses in support of Aeropuertos y Servicios Auxiliares (hereafter referred to as "ASA"). The primary component of the Project was to acquire new satellite images over the Project areas to be surveyed as shown in Figure 1.



Source: GoogleEarth

Figure 1 – The Project Survey Site is Composed of Three Areas: Photogrammetric Survey Area (PSA), Area A, and Area B

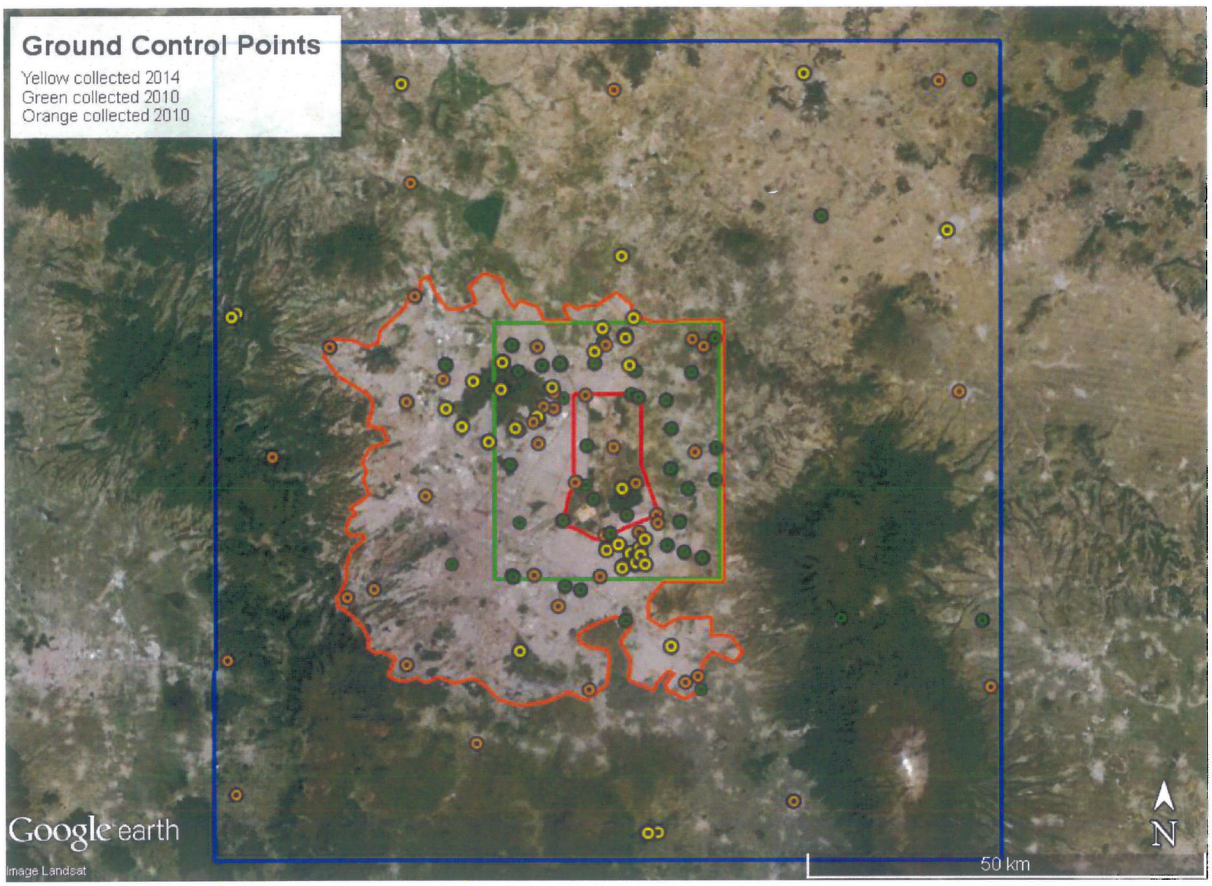
The satellite images will be acquired in both Stereographic and Monoscopic mode, depending on the area, and used to identify and map features on the ground. Stereoscopic imagery was tasked over the PSA, Area A, Sierra de Guadalupe, Chiconautla, Chimalhuacán and parts of Area B over the urban core of Mexico City. Monoscopic imagery was tasked over the Area B. The imaging plan can be seen in Figure 2.



Source: GoogleEarth

Figure 2 – Stereoscopic and Monoscopic Image Tasking Areas

After the Kick-Off meeting held on Monday, 28 April 2014 at ASA's offices in Mexico City, the Site Assessment Visit collected Ground Control Points (GCPs) over all Project areas. Refer to the MDA report titled Photogrammetric, Satellite-Based Survey of the Texcoco Area and Its Surroundings: Site Assessment Report for details. Coupled with GCPs acquired by MDA during a previously conducted survey of the Texcoco area and its surroundings in 2010 (which were re-validated as part of this new Project), there are now over one hundred points to be used in processing the satellite imagery to the accuracies required. These points and their locations throughout the Project areas are illustrated in Figure 3.



Source: GoogleEarth

Figure 3 – GCPs over Project Areas

MDA will be using stereoscopic WorldView-1 panchromatic Satellite Images for Terrain and stereo Obstruction collection as per Table 1 below. The Contractor will also have complete monoscopic coverage of all Project areas using WorldView-2 pansharpened natural colour Satellite Images for the final Colour Mosaic deliverable. Monoscopic Satellite Images will be acquired over Area B as per Table 1 below.

Table 1 - Project Area Monoscopic and Stereoscopic Satellite Image Requirements

Aeronautical Area	Stereoscopic	Monoscopic
PSA including the MITRE box	X	
Area A	X	
Area B Urban Core of Mexico City	X	
Area B		X
Sierra de Guadalupe, Chiconautla and Chimalhuacán	X	

The satellite images were tasked with the following parameters as per Table 2.

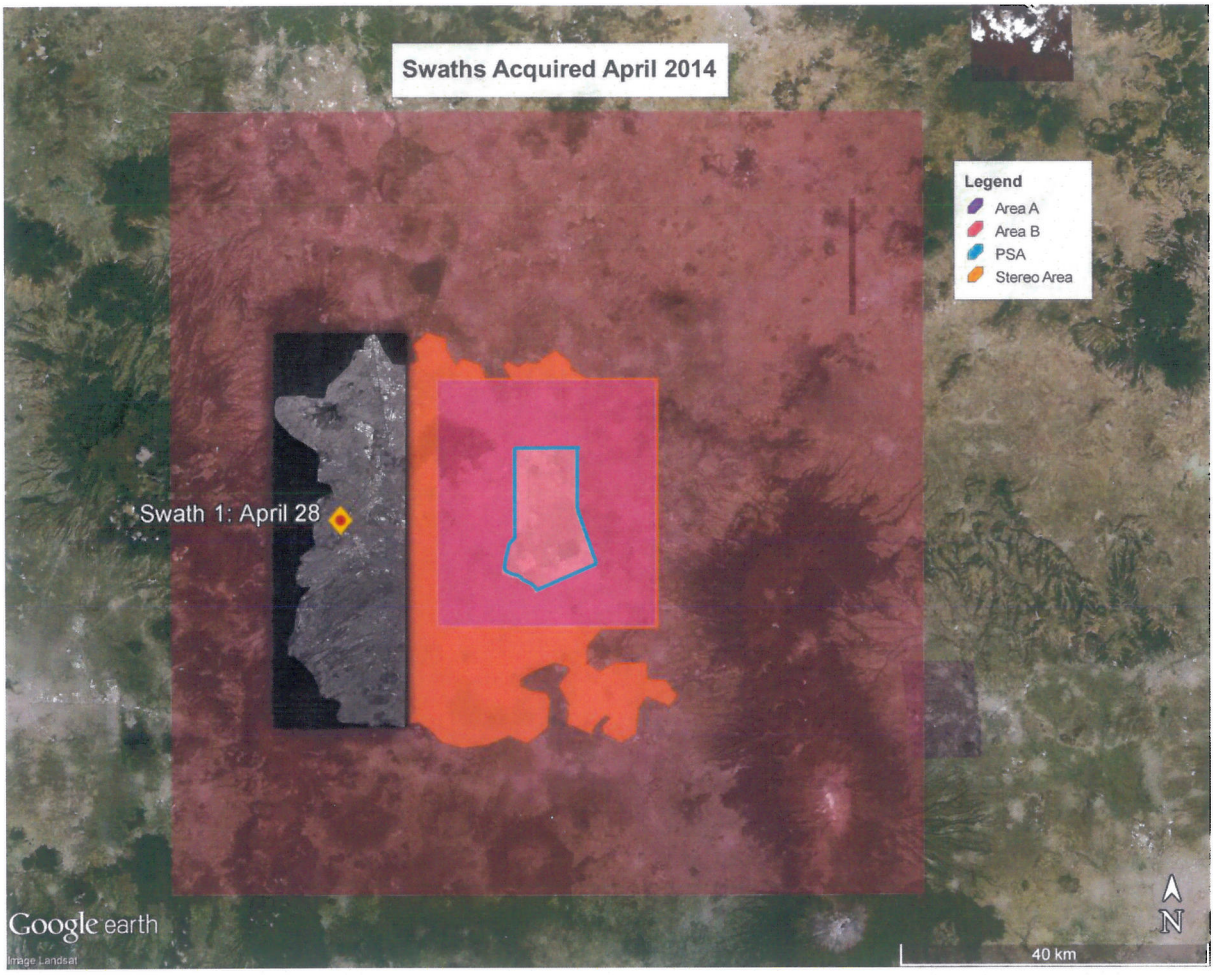
Table 2 - Monoscopic and Stereoscopic Satellite Image Requirements

WorldView-1 Stereoscopic Images:	***WorldView-2 Monoscopic Images:***
1. New tasking only	1. New tasking only
2. 0.50 m or higher final Ground Sampling Distance ("GSD") or resolution	2. 0.50 m or higher final GSD or resolution
3. Off-nadir angle for nadir Satellite Image of stereopair not to exceed 20° (degrees)	3. Off-nadir angle for monoscopic Satellite Image not to exceed 20° (degrees)
4. The overall specification for cloud coverage is 15% or less.	4. The overall specification for cloud coverage is 15% or less.
5. Standard Ortho Ready product	5. Standard Ortho Ready product
6. Dynamic Range Adjustment Off, 16 bit, Enhanced Kernel	6. Dynamic Range Adjustment On, 8 bit, Enhanced Kernel
7. Universal Transverse Mercator (UTM) World Geodetic System 1984 (WGS84) Projection	7. UTM WGS 84 Projection

2 Project Areas and Images Acquired

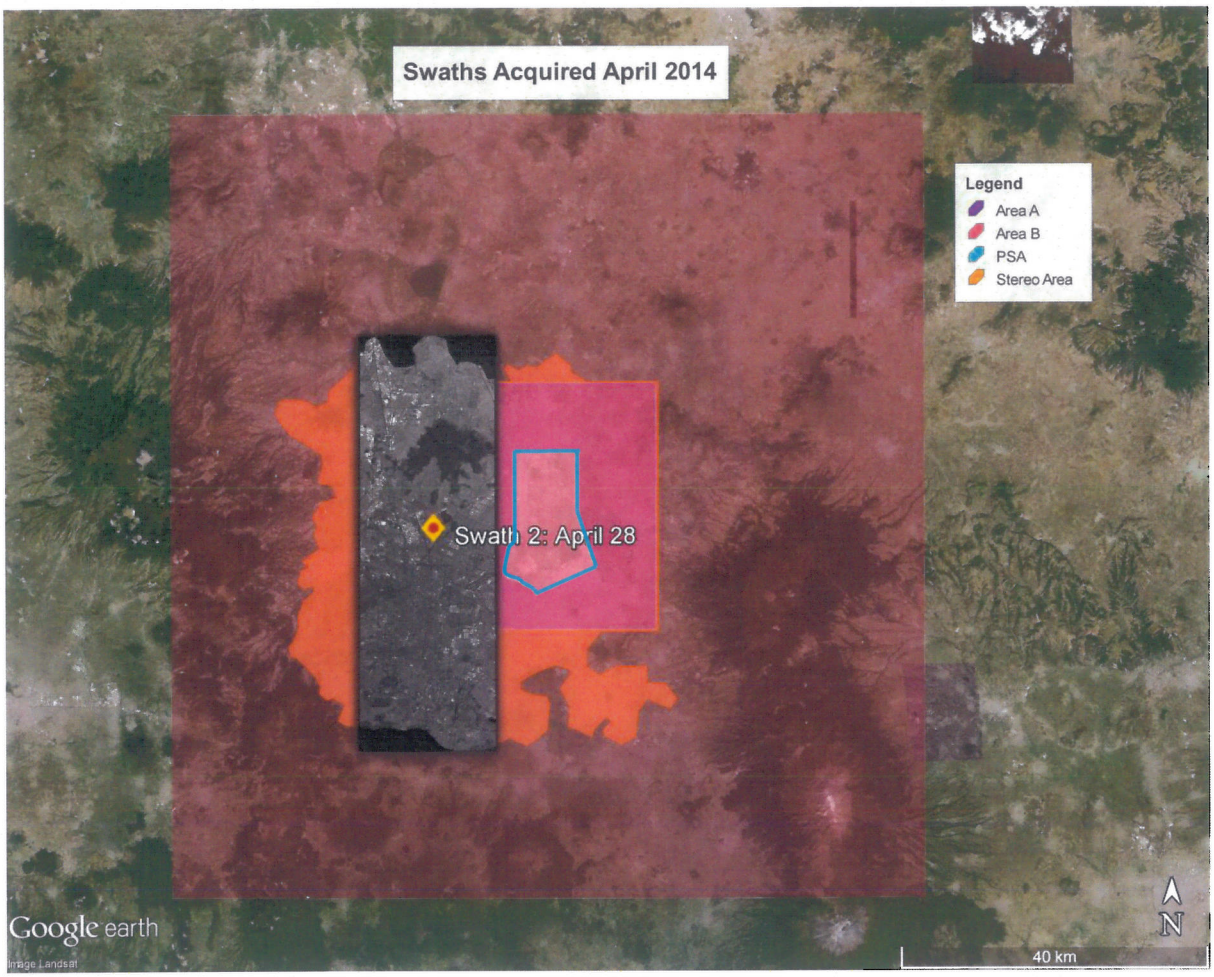
Views of each satellite image are shown in Figures 4 through 14 to illustrate completeness of the tasking order. MITRE has been provided with near full-resolution images to check for cloud coverage issues and the appropriateness of each individual scene.

2.1 Stereoscopic WorldView-1 Acquisitions



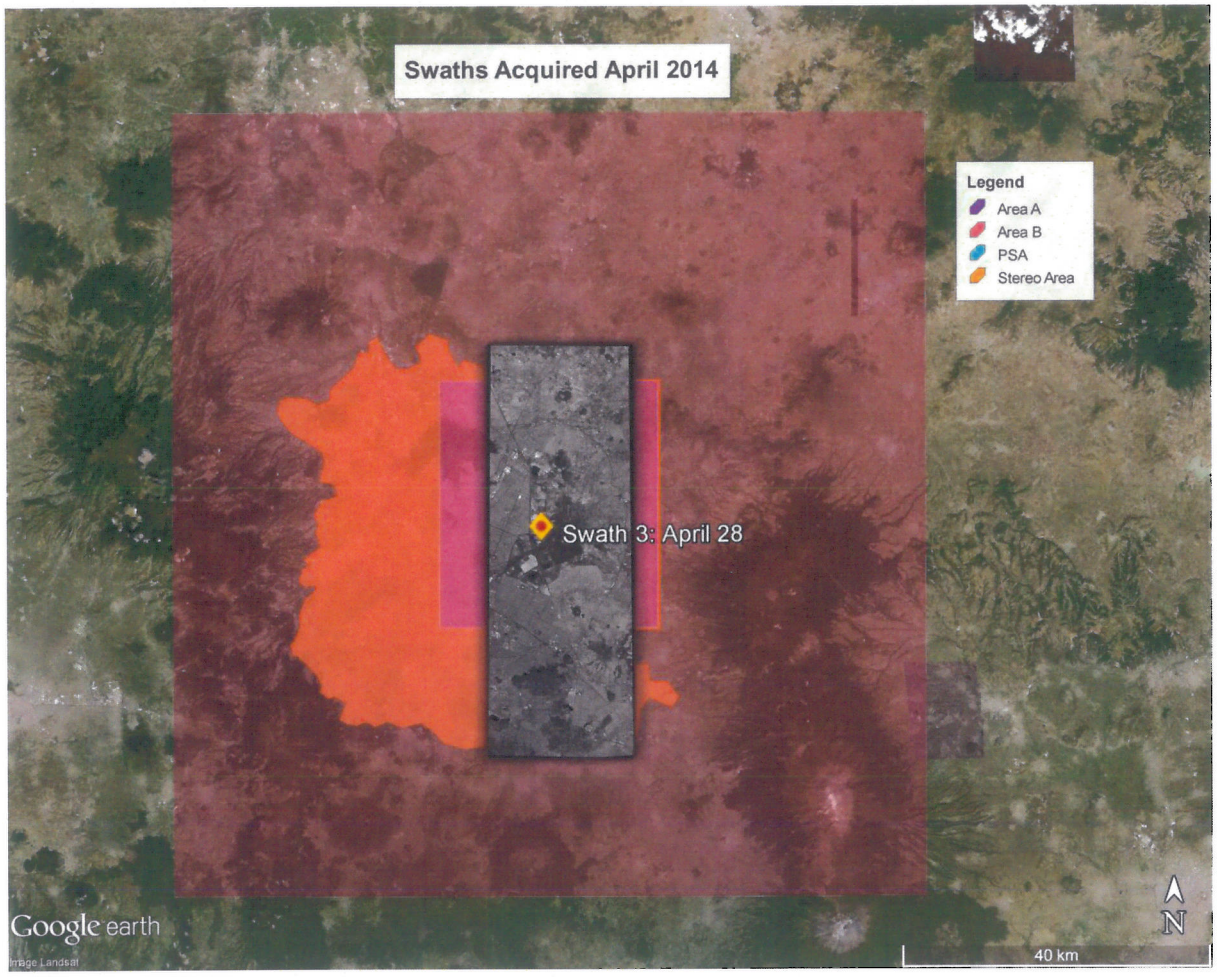
Source: GoogleEarth

Figure 4 – Swath 1: Stereoscopic WorldView-1 Acquisition



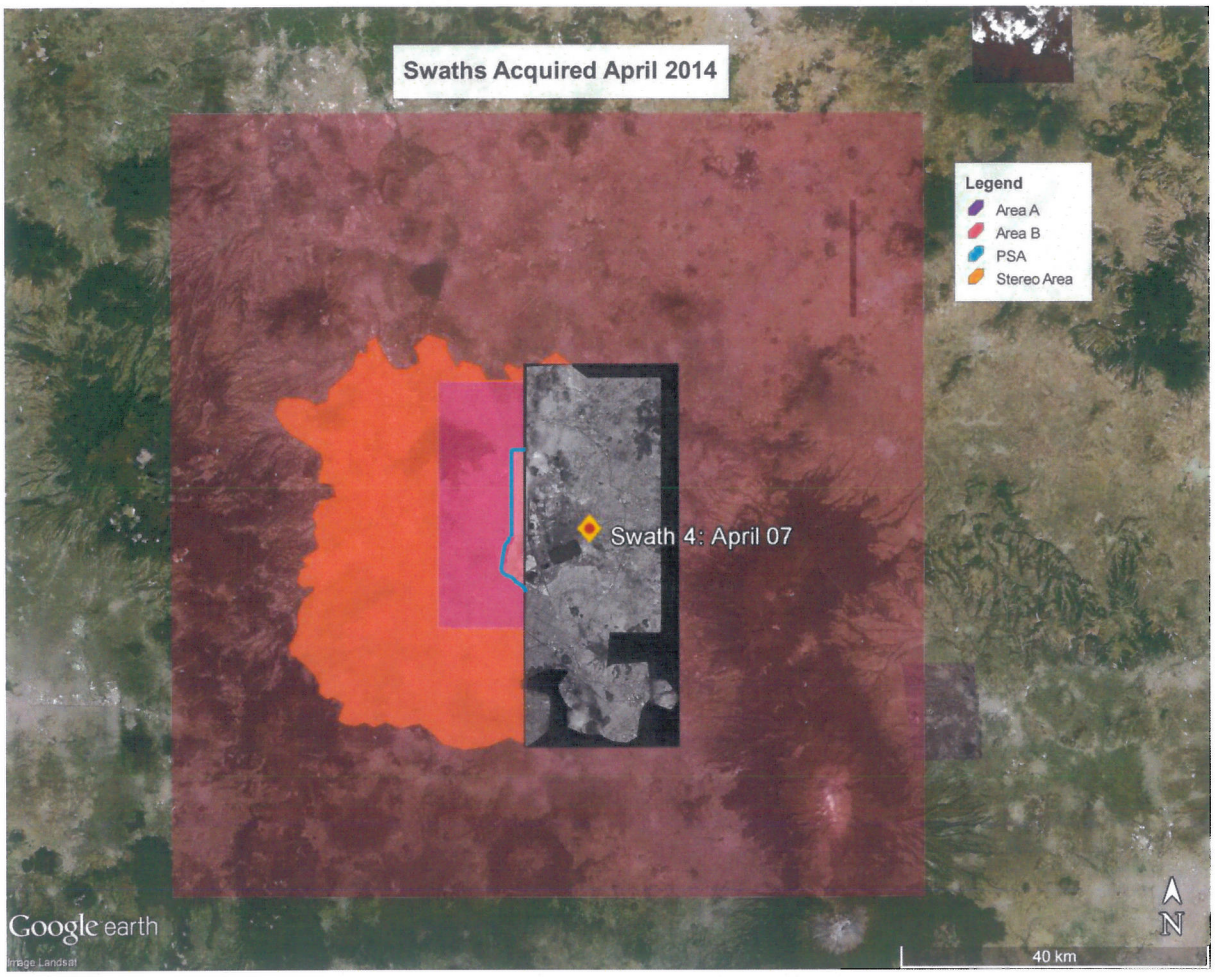
Source: GoogleEarth

Figure 5 – Swath 2: Stereoscopic WorldView-1 Acquisition



Source: GoogleEarth

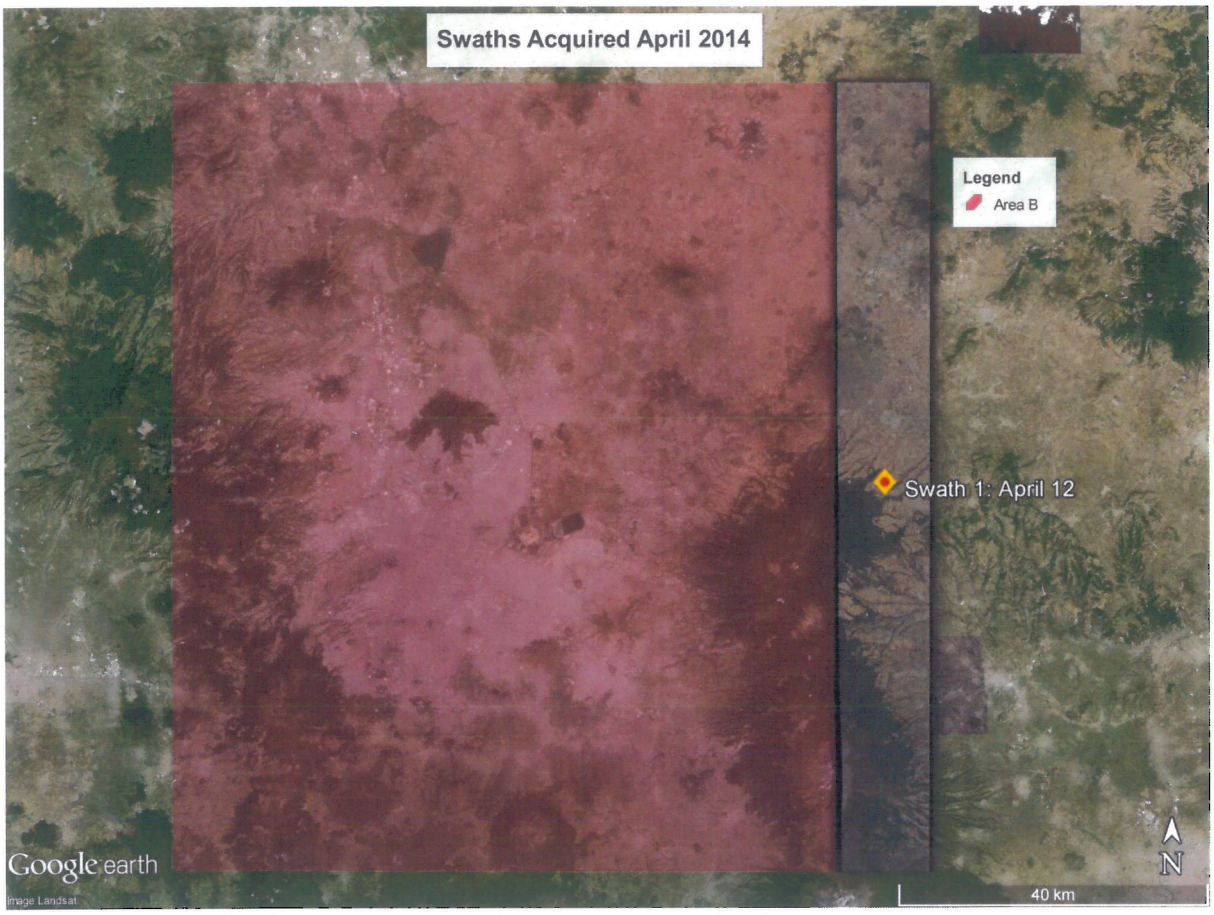
Figure 6 – Swath 3: Stereoscopic WorldView-1 Acquisition



Source: GoogleEarth

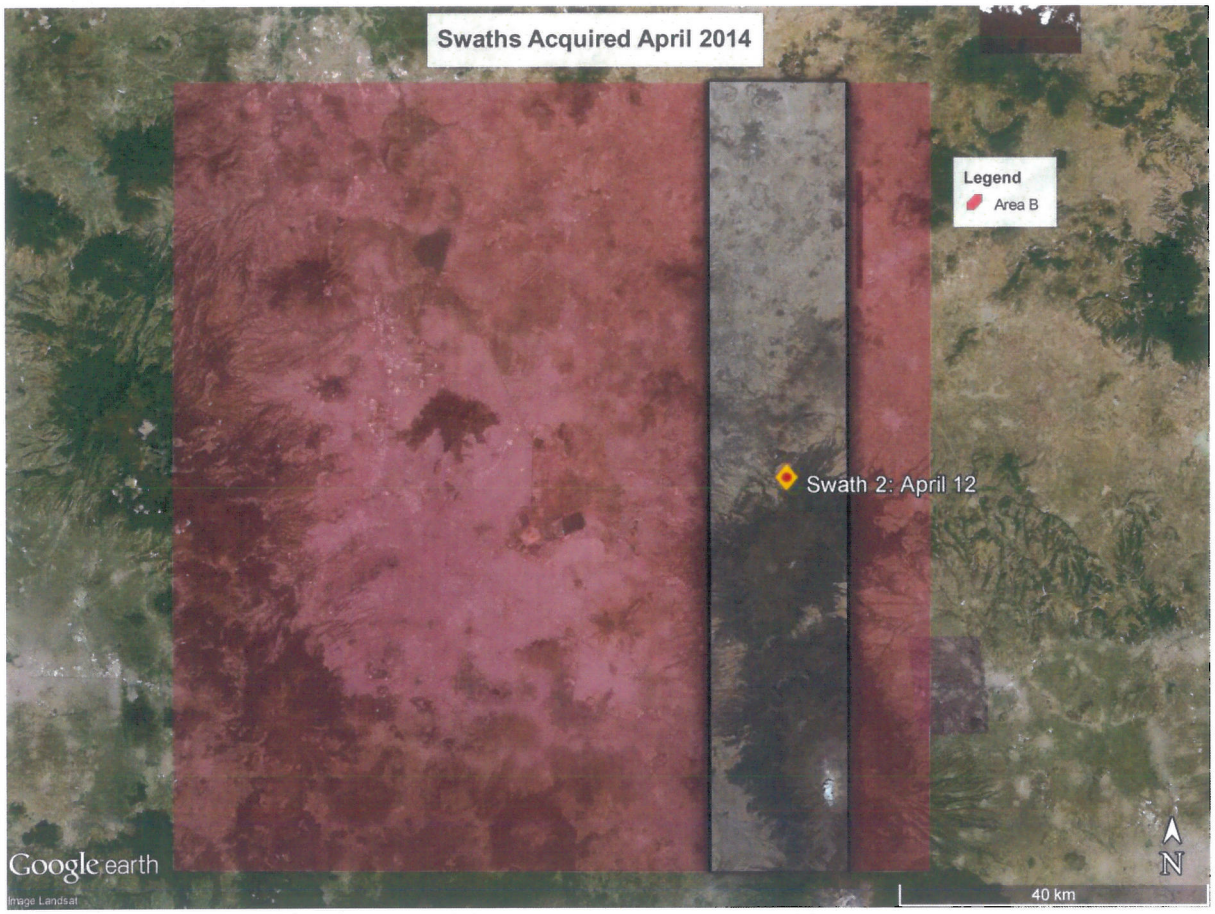
Figure 7 – Swath 4: Stereoscopic WorldView-1 Acquisition

2.2 Monoscopic WorldView-2 Acquisitions



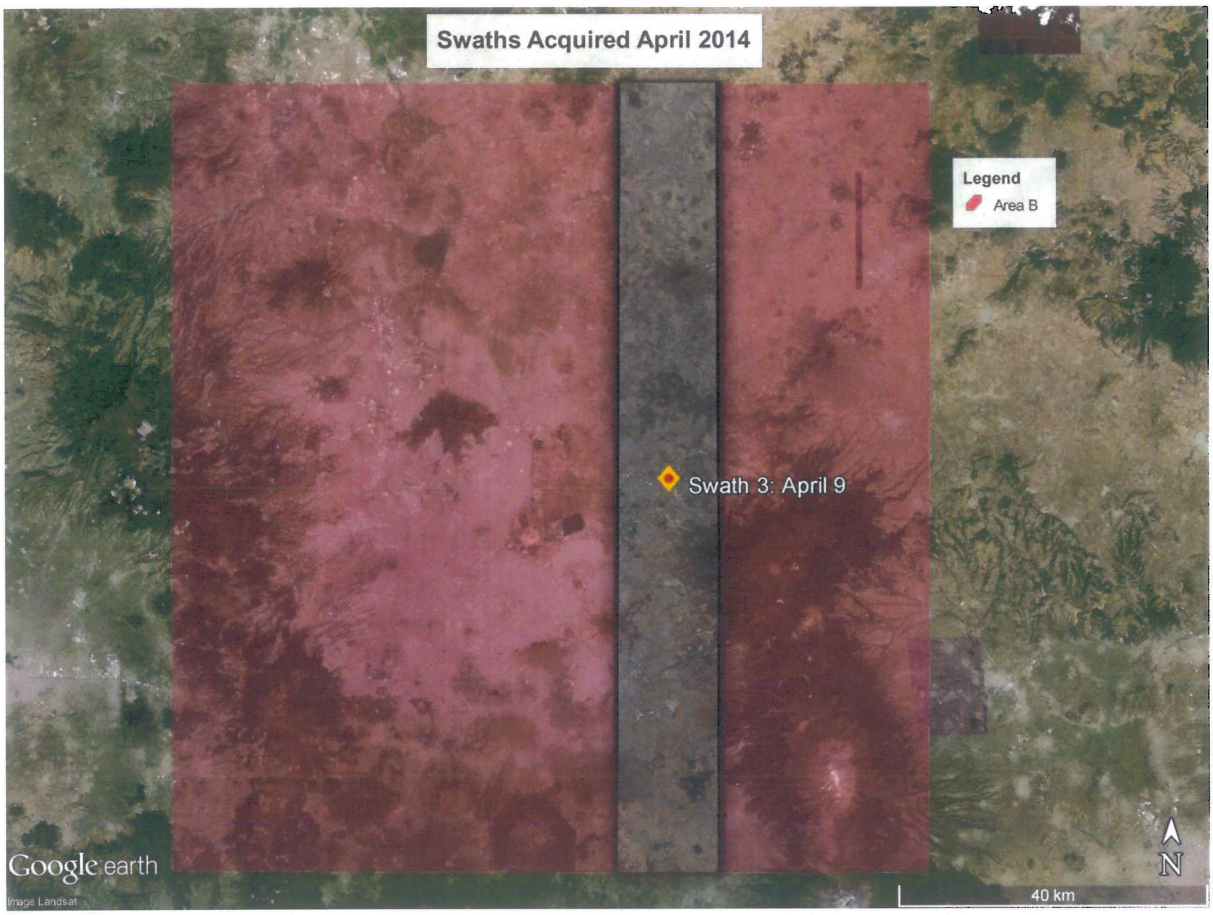
Source: GoogleEarth

Figure 8 – Swath 1: Monoscopic WorldView-2 Acquisition



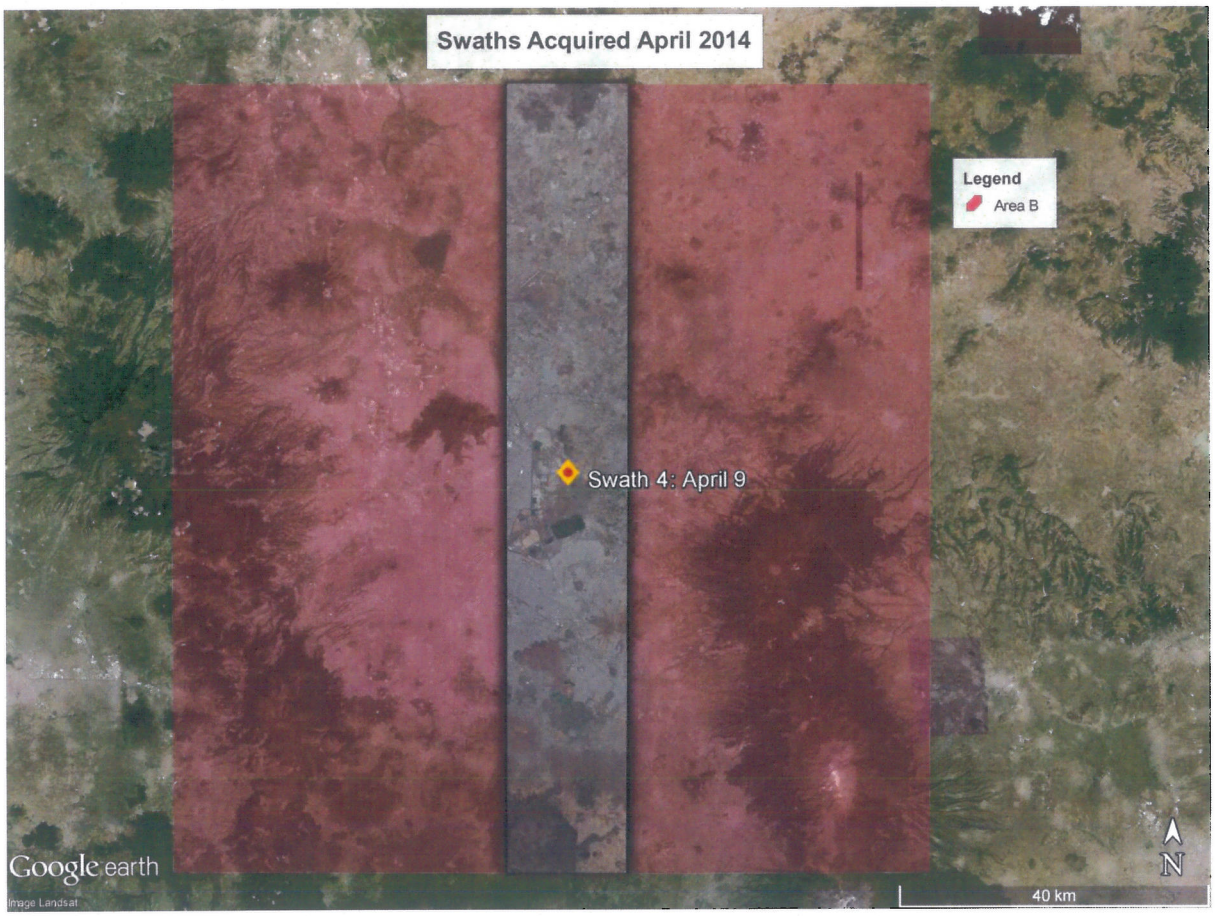
Source: GoogleEarth

Figure 9 – Swath 2: Monoscopic WorldView-2 Acquisition



Source: GoogleEarth

Figure 10 – Swath 3: Monoscopic WorldView-2 Acquisition

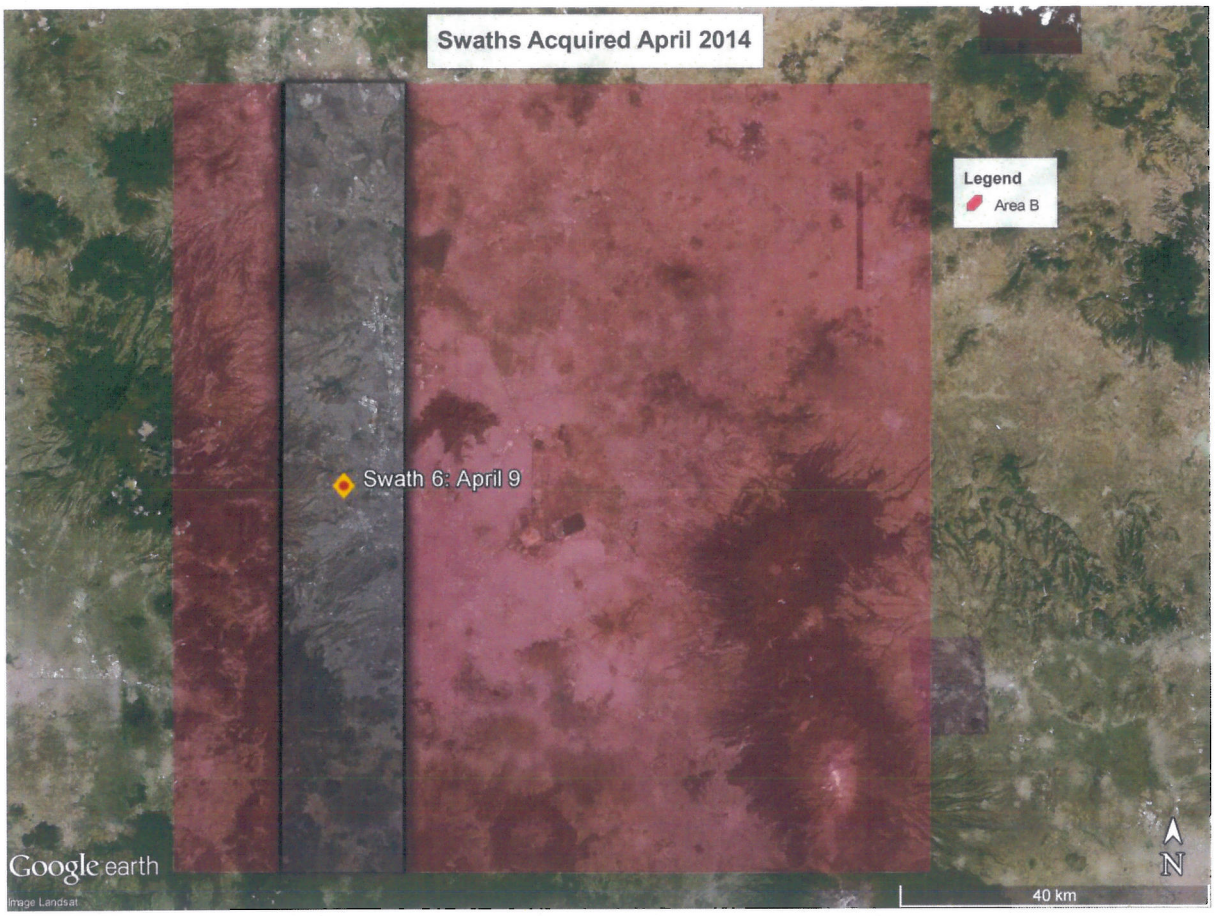


Source: GoogleEarth

Figure 11 – Swath 4: Monoscopic WorldView-2 Acquisition

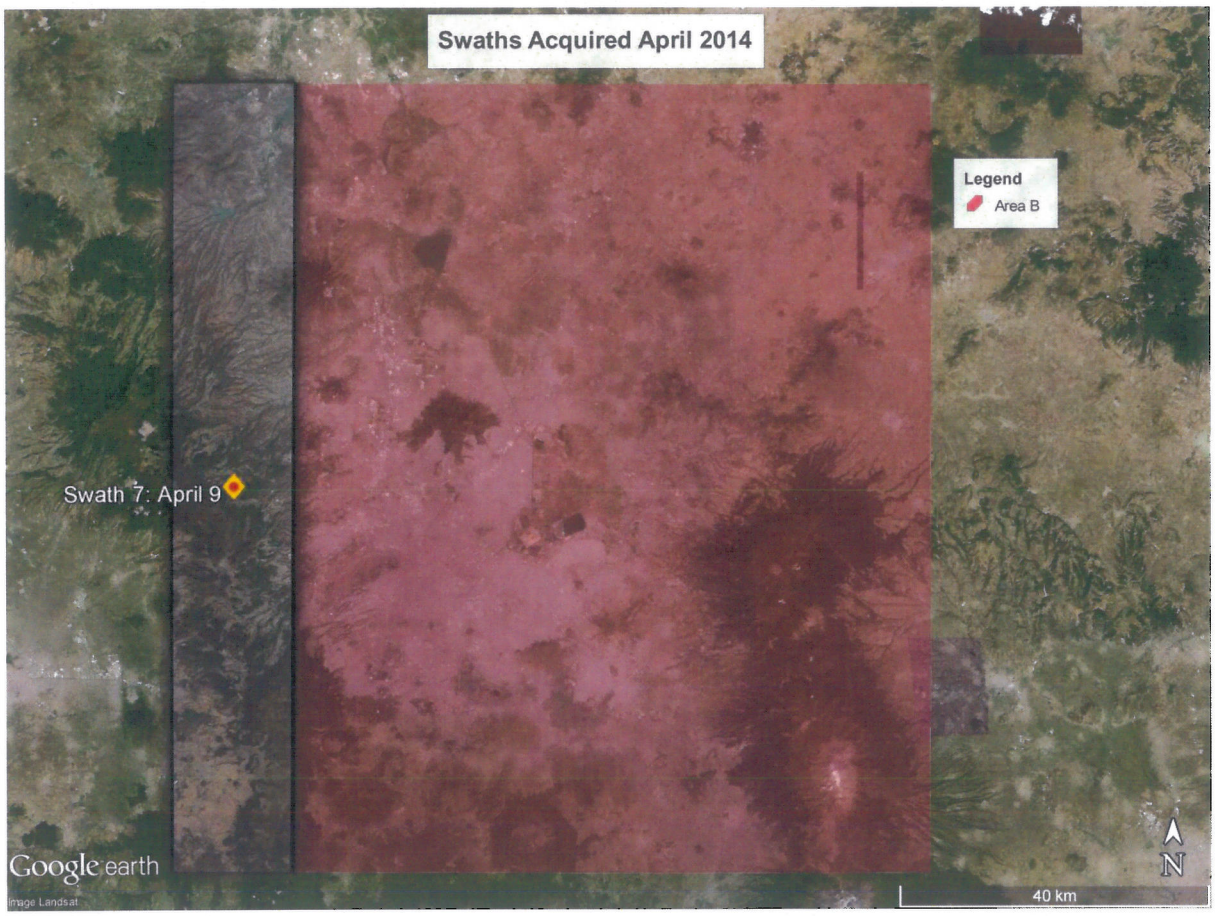
Source: GoogleEarth

Figure 12 – Swath 5: Monoscopic WorldView-2 Acquisition



Source: GoogleEarth

Figure 13 – Swath 6: Monoscopic WorldView-2 Acquisition



Source: GoogleEarth

Figure 14 – Swath 7: Monoscopic WorldView-2 Acquisition

3 Conclusion

Satellite image acquisition is completed.

MDA will utilize the satellite imagery that has been acquired and delivered from DigitalGlobe for all processing steps and data capture requirements. The Project is progressing well with the Site Assessment Visit, including GCP collection completed successfully.