

Addendum to the Preliminary Report for Airborne Data Collected
 In Support of US EPA Region VII
 Barton Solvents
 Valley Center, Kansas

Flight Status

Flight sortie II was initiated at 2212 (1712) and resulted in six data passes over the site. Flight information is summarized in Table 1 and the flight track is given in Figure 4.

Table 1. Flight Status Sortie II – 17 July 2007

Run (log sheet run #)	Time (GMT)	Altitude (MSL Ft)	Heading (Deg)	L/S File (2007_07_18....	FTIR File	Comments
1	22:12	-----	---	---	---	System Test All OK
2 (R02)	22:37	3300	190	22_37_46_R02	W37	4 photos 16 cm-1
3 (R03)	22:40	3200	170	22_40_28_R03	W40	10 photos 16 cm-1
4 (R04)	22:42	3000	176	22_42_10_R04	W44	5 photos 16 cm-1
5 (R05)	22:46	3000	258	22_46_57_R05	W46	4 photos 16 cm-1
6 (R06)	22:49	3000	101	22_49_11_R06	W49	4 photos 16 cm-1
7 (R07)	22:52	3000	---	22_52_32_R07	W52	3 photos 16 cm-1

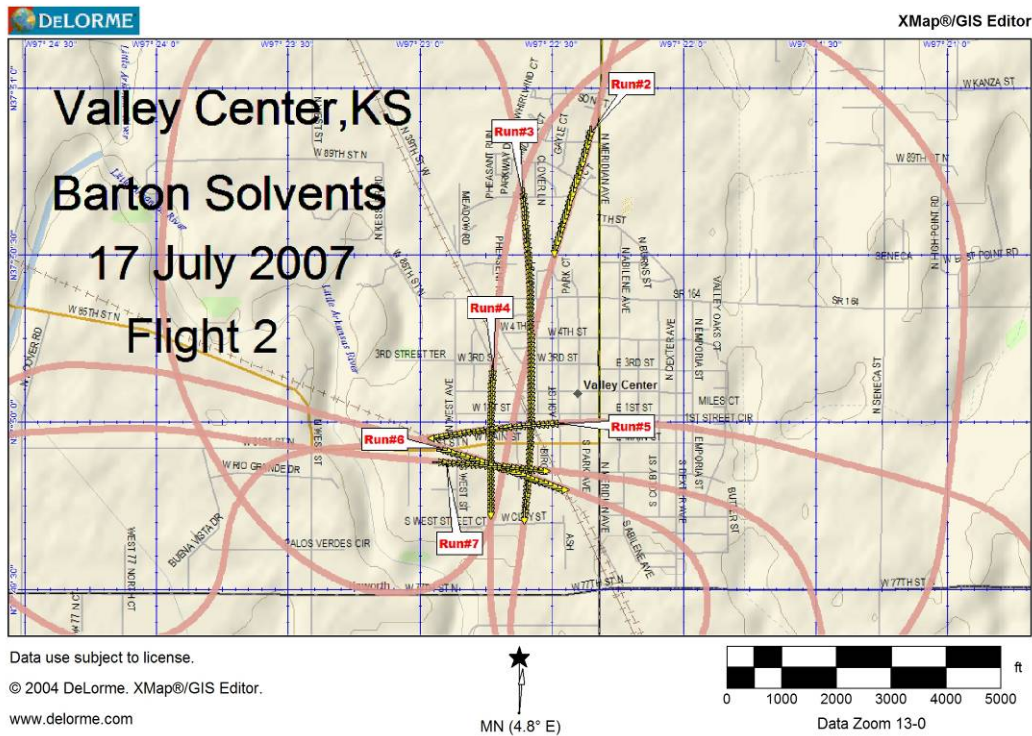


Figure 4. Flight Tracks

Data Results

Aerial Images

Aerial images collected during the early phases of the sortie II showed a significant reduction in the fire and plume as compared to the earlier data collection. Figure 1 shows a typical image. Following data pass 4 the flight crew noted a large amount of turbulence. The following series of images showed that the fire had significantly accelerated and a plume was fully developed (Figure 2)

Line Scanner Data Results

Results observed in the aerial images were captured in concurrent IR imagery collected. Figures 3, 4, and 5 shows a series of data passes corresponding to data passes 4, 5 and 6. Examination of figure 3 shows a significant reduction in thermal energy at the site as evident by the spotty patches at the site. A small plume can be seen being emitted from a hot tank. The next image (figure 4) looks very similar except for a zone that indicates a large thermal change in the image. This zone appears as an area of distortion in the image but is a result of the rapidly changing thermal environment while the image was being scanned. Figure 5 corresponds to the next data pass. The site is extremely hot due to the accelerating fire.

FTIR Data Results

Spectral data was collected using the FTIR for each pass. The following is a table summarizing the data sets generated during the flight.

Run	Compound
1	System Test
2	Trace < 1 ppm Glycol
3	Ozone < 1 ppm Glycol Trace = < 1 ppm Benzyl Alcohol = 3 ppm
4	No Detections
5	Glycol Trace = < 1 ppm Benzyl Alcohol = 3 ppm
6	Glycol Trace = < 1 ppm
7	Benzyl Alcohol = 3 ppm Possible Ketone = < 1 ppm

Table 2 – FTIR data set and detection notations.

Analysis of the FTIR data collected on sortie II tended to show similar detections to those in the sortie I. Glycol, ozone, and benzyl alcohol were detected in most of the runs. Estimated concentrations for the benzyl alcohol appear to be reduced by about 2/3 from those observed in the first sortie. Following the acceleration in the fire, a weak signature of a possible ketone was detected in a few of the spectra for data collection 7. Figure 6 shows a representative spectra of the possible ketone. Spectral features including the peaks observed at 950, 1060, and 1130 wavenumbers suggest that this compound is a ketone. A significant identification was not possible due to the weak nature of the spectrum in addition to possible interference from ozone.

Conclusions

Data collected over the Barton Solvents facility during flight sortie II initially indicated that the fire and resulting plume had greatly decreased from observations made in Sortie I. During data pass 4 the site flared up and the fire and plume redeveloped.

Spectral analysis of the plume generated by the fire showed trace levels of ozone and glycol and approximately 3 ppm of benzyl alcohol. Following the flare-up at the site, a possible signature of a ketone was noted but identification of the exact compound was difficult due to the weak nature of the compound.



Figure 1. Aerial Image Data Pass 4, Sortie II, Barton Solvents, Valley Center, Kansas



Figure 2. Aerial Image Data Pass 5, Sortie II, Barton Solvents, Valley Center, Kansas



Figure 3. IR image Run 3 – Sortie II, Barton Solvents, Valley Center, Kansas



Figure 4. IR image Run 4 – Sortie II, Barton Solvents, Valley Center, Kansas

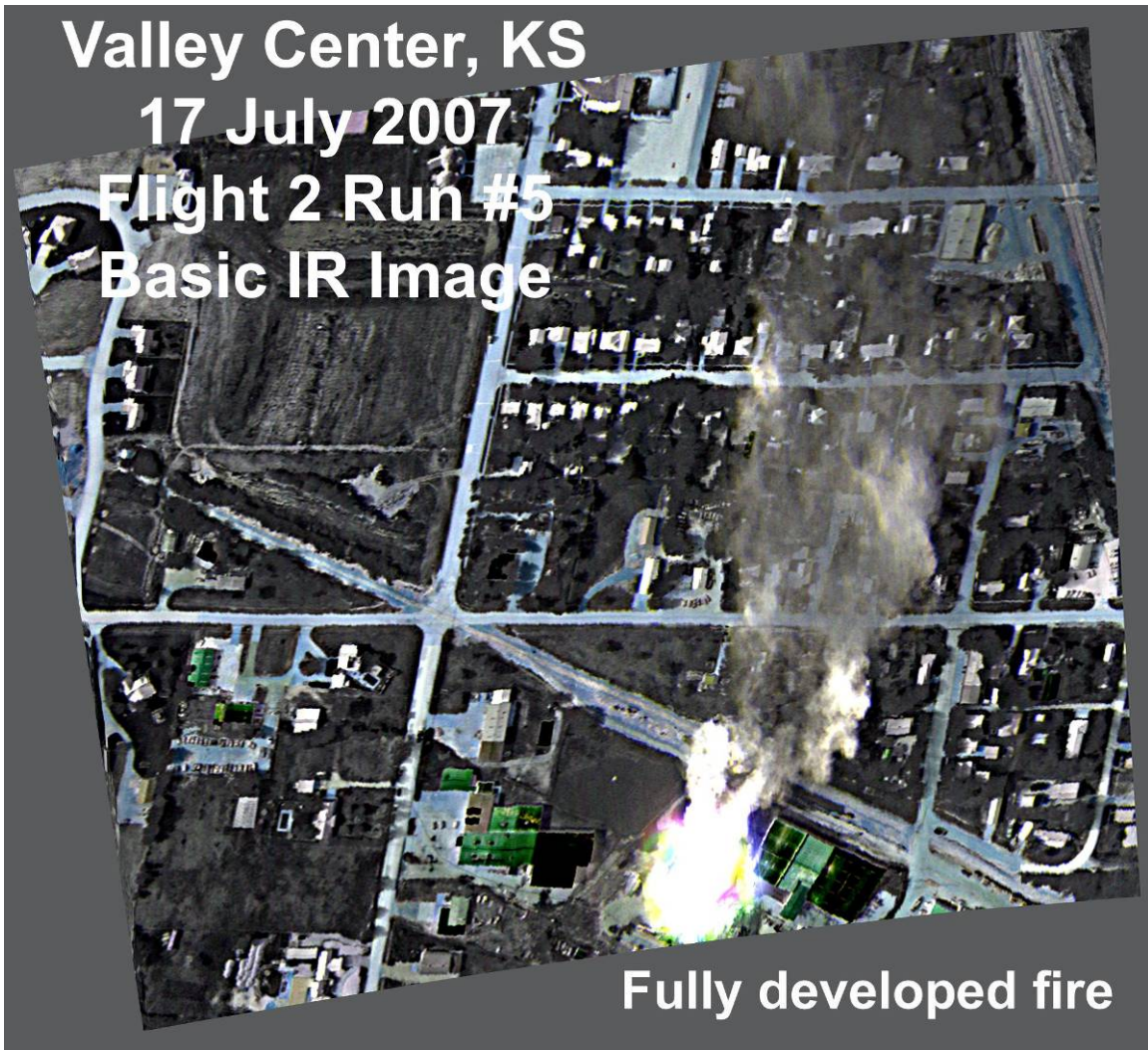


Figure 5. IR image Run 5 – Sortie II, Barton Solvents, Valley Center, Kansas

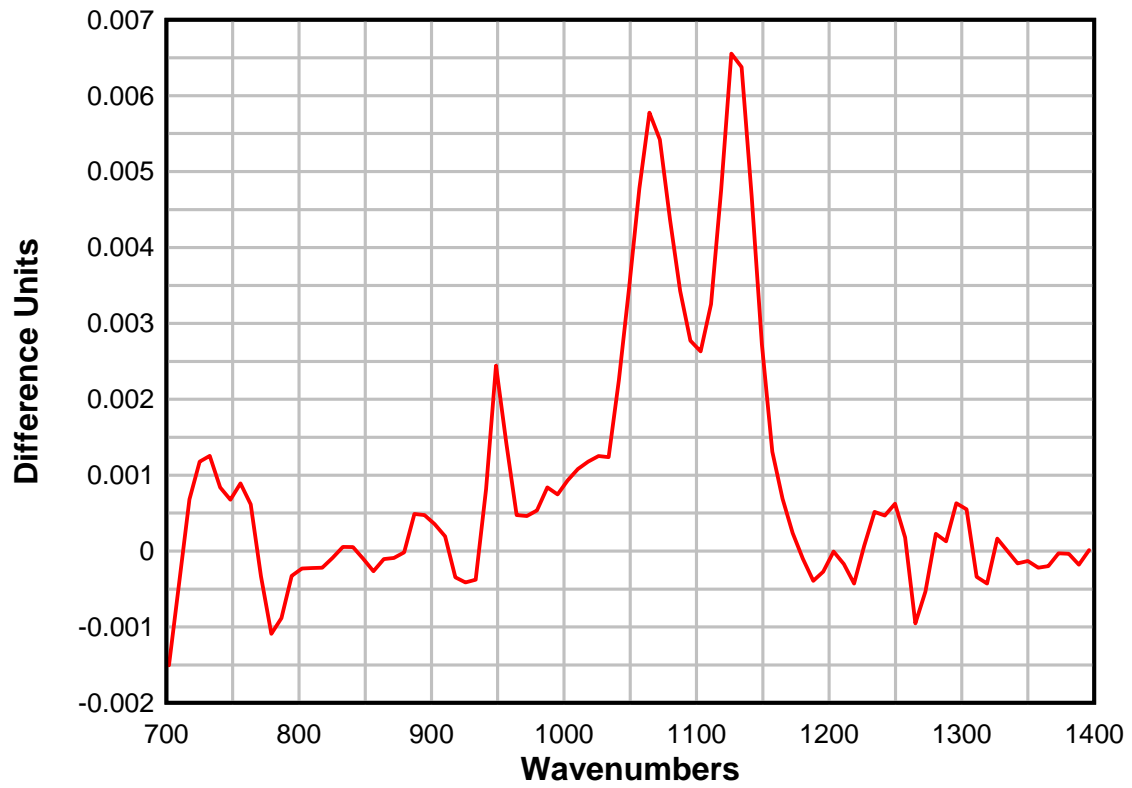


Figure 6. Possible Ketone Detection, Data Pass 7, Barton Solvents, Valley Center, Kansas