

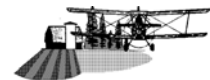
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Stainalysis Manual

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REMSpC



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Stainalysis is a software program that assists applicators in assessing the characteristics and uniformity of deposit from spray equipment. Deposit from dyed tank mixes can be analysed on Kromekote cards. Discrimination against dirt or spurious stains is accomplished using colour-notch (set by the user) and drop filter techniques.

The Stainalysis software has been designed

1. to size stains on cards
2. to convert stains to equivalent drop sizes
3. to produce volume fraction, number fraction, and cumulative volume fraction curves, as well as VMD, coverage, and equivalent volume statistics for each card
4. to merge cards to produce composite statistics
5. to plot statistics of a multiple-card sample line.
6. to carry out a swath analysis on deposit and drop density.

Scanner requirements

Cards can be scanned using any flat-bed scanner that can acquire images with a minimum of 600 dpi optical resolution. Scanned cards can be saved in several formats (GIF, BMP or TIF, but **never** JPG) with an 8-bit colour depth (256 colours). Therefore, scanner software should be capable of reducing images to this colour depth. Also, when selecting a scanner, care should be taken to ensure that various software functions such as image smoothing, dithering or sharpening can be disabled. Although different cards within a trial can be scanned at different resolutions, it is recommended that all cards be analysed at the same resolution. Finally, it has been found that some scanning software does not properly record scanner resolution (dpi) in the image files and so these values should be recorded for future reference when running the program. Questions should be directed to Stainalysis@REMSpC.com

Caution

When discrimination for stain shape is not used, overlapping stains are combined to reflect an equivalent stain size from which drop diameter is calculated. Caution should be taken when analysing cards with overlapping stains.

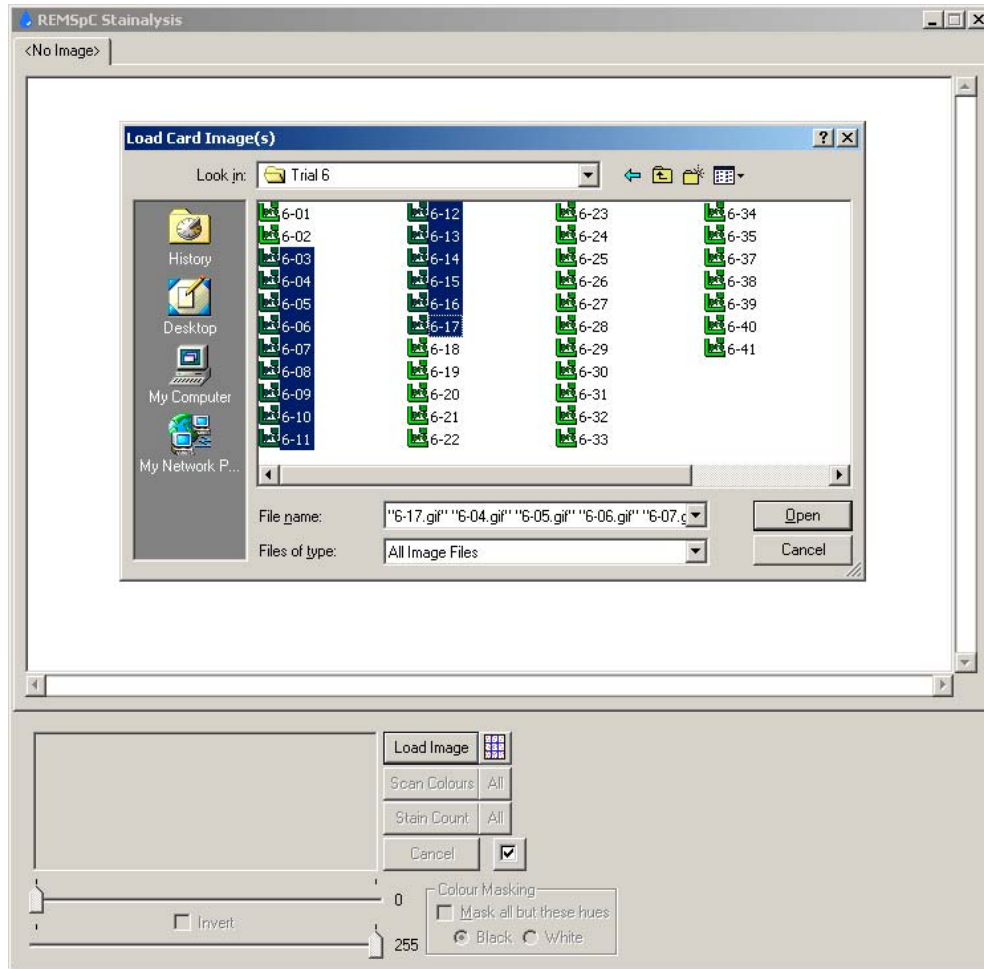
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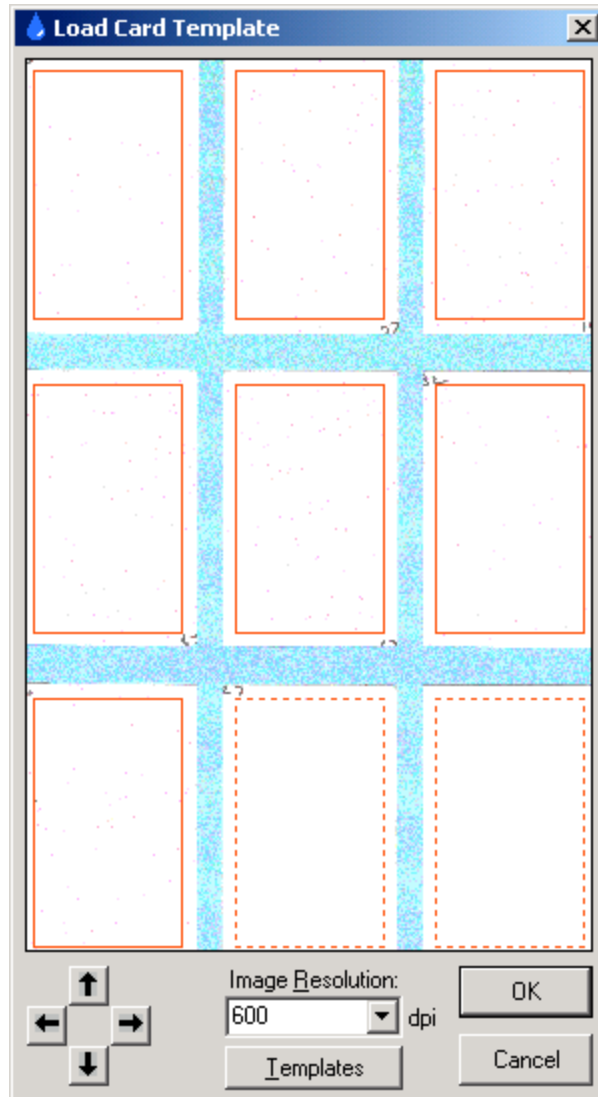
Load Image



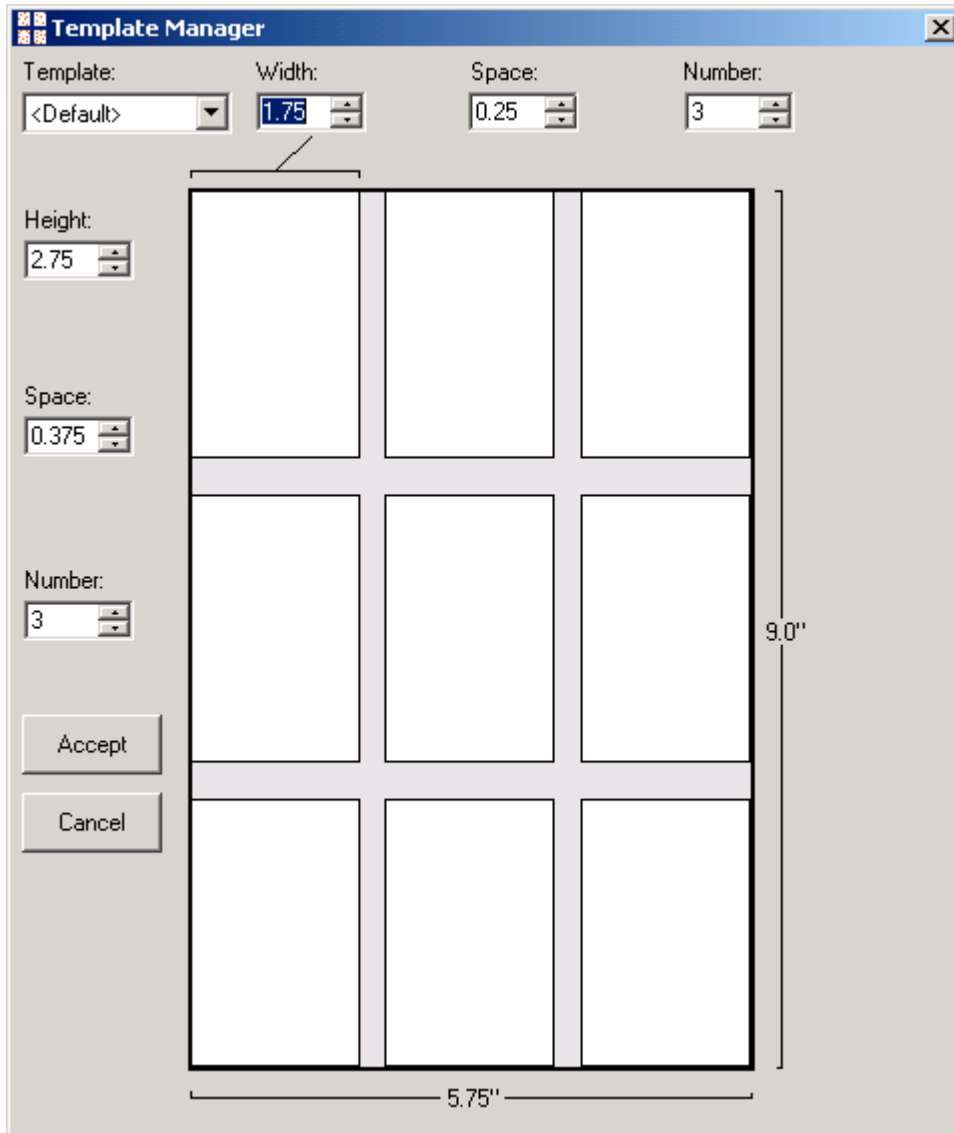
Loading Images / Templates



When the **Load Images** button is clicked, individual cards or complete card lines can be loaded by highlighting the appropriate files (pressing <Ctrl-A> selects all files in the **Open** window). When analysing a complete card line, it is often helpful if scanned cards are given names that reflect their position along the sample line (i.e. Card-01, Card-02, etc.). When multiple cards are loaded, they are sorted alphabetically.



Alternatively, cards can be scanned and loaded as a batch, as pictured above. After selecting the template image file, it will appear in the above window. The resolution of the image is assumed to be the default resolution (set in Preferences), but this can be changed as needed. The OK button will be disabled if any portion of one or more rectangles falls outside the image area. The positions of the boxes can be adjusted by clicking the arrow buttons, or by pressing the keyboard arrow keys. Individual template boxes can be unselected (shown with a dashed border) by clicking on the appropriate box. Clicking on the box again reselects it. To load, modify or create a template, click the **Templates** button (see next page).

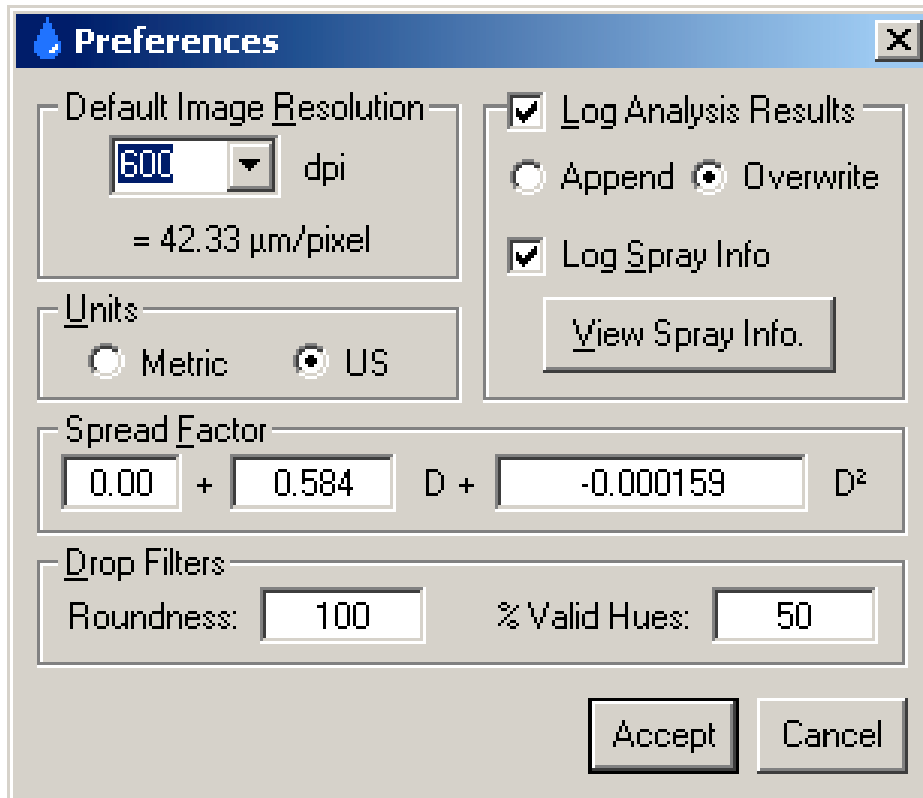


The template manager form initially displays the layout of the currently selected template (shown in *inches*, regardless of the units selected in Preferences). Different template layouts can be loaded by selecting a template from the **Template** drop down list. The values shown in the various textboxes can be modified, at which point a **Save** button will appear. To create a new template, simply click the **Save** button and enter a name for the new template. When the **Accept** button is clicked, the **Load Card Template** form (see previous page) is updated with the newly selected layout.

To remove a card from Stainalysis, simply select the appropriate card's tab and press the <Delete> key. Pressing <Ctrl-Delete> removes all cards from Stainalysis, in effect resetting the program to its initial state.



Setting Preferences (Ctrl-P)



Default Image Resolution Sets the default scanner resolution initially assigned to all deposit cards as they are loaded into Stainalysis (this can later be changed, see page 8).

Units Controls the display of various units in Stainalysis.
(ie. L/ha – oz/ac, km/h – mph, etc.)

Log Scan Results When checked, results from each card's droplet analysis (see Appendix 1) are saved in a text file having the same filename as the image (with the extension changed to SCN). Results from a re-analysis of a deposit card can be appended to or replace any previous analyses for that card.

If **Log Spray Info** is checked, information describing the spray will also be inserted into each SCN file. Clicking the **View Spray Info** button allows the information to be changed (see next page).

Spread Factor

Relates diameter of deposited drop to stain diameter (D) on the card. Spread factor can vary with product used, tank mix, drop size and type of collector surface (Kromekote card, water or oil sensitive cards). A quadratic function can be used to define the variation of stain size with drop size due to different spreading effects. **Warning: Ensure the quadratic represents the full range of stain sizes being examined else calculated drop diameter can decrease with increasing stain diameter.** If the variation of spread factor with stain size is unknown, spread factor parameters should be zero except for the D coefficient.

Drop Filters

Discrimination filters for removing unwanted stains. Trigger values range from 0 - 100%.

% Valid Hues - Percentage of valid hues in stain must equal or exceed chosen level. Value of 100 accepts only stains with every pixel having acceptable colour hue, 0 accepts all stains with at least one pixel having a valid colour hue. Stains with no acceptable colour hues are automatically rejected.

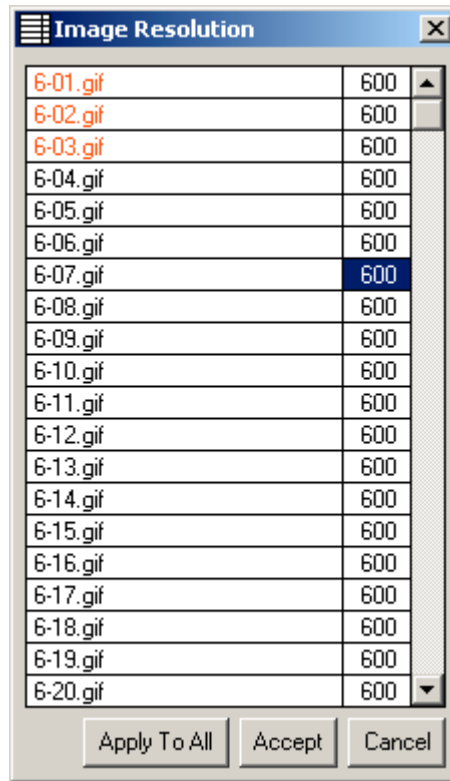
Roundness - Compares actual stain area to hypothetical circular stain with diameter equal to largest x or y dimension of actual stain. Roundness gives % variation that is allowed. Value of 0 means stain must be perfectly round, value of 100 means all stains would be accepted regardless of shape.

Spray Information	
Aircraft	
Type:	Hughes 500
Registration:	F12345
Owner:	John Doe
Swath:	60 ft
Speed:	50 mph
Height:	50 ft
Nozzles	
Type:	Micronair Electric - Med
Number:	4
Sampler	
Type:	Kromekote Card
Spread Factor:	0.0 + 0.56 D + -0.000159 D ²
Spray Characteristics	
Product:	Product ABC
Active Rate:	16 oz/ac
Spray Rate:	16 oz/ac
Sample Array	
Position of Sampler1: (w.r.t. A/C centerline)	-50 ft
Sampler Separation:	10 ft
Comment	
Trial #2 -- into wind	
<input type="button" value="Reset Values"/> <input type="button" value="Accept"/> <input type="button" value="Cancel"/>	

- Aircraft*** Describes aircraft and application characteristics.
- Spray Characteristics*** Describes tank mix, active rate and spray rate. For dilute tank mixes, spray rate reflects the total application rate.
- Nozzles*** Describes the type and number of nozzles mounted on the boom.
- Sampler*** Describes sampler type and associated spread factor (same as viewed on Preferences page).
- Sample Array*** Defines position of sampler array with respect to the spray line. Co-ordinate system is in the frame of reference of the spray vehicle (i.e. left is negative, right is positive). Sampler 1 is assumed to be the outermost card to the left of the spray vehicle. Sampler Separation is the distance between sampler locations and is a positive number.

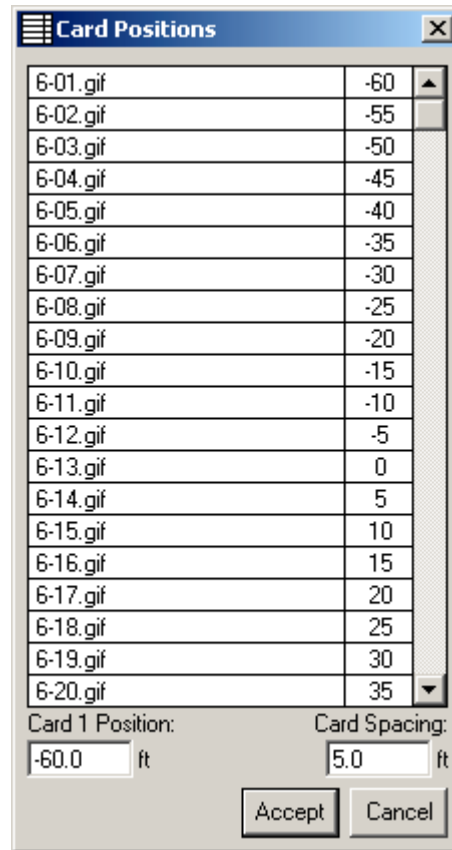
 **Setting Image Resolutions / Card Positions** (Ctrl-R)

Clicking this button will bring up one of two forms, depending on whether or not composite card results are being displayed. If single card results are displayed, the **Image Resolution** form appears, and if composite results are displayed, the **Card Positions** form appears.



When a series of deposit cards is loaded into Stainalysis, each card is assigned the default scanner resolution (set in the Preferences) and an **Image Resolution** button appears in the lower right-hand corner of the image area. Clicking this button displays dpi resolutions for each card in the series. Resolution values for each card can be changed as appropriate (if, for example, some of the cards were digitised with a different scanner, having a different resolution, or if the cards were loaded with the wrong Default Resolution set in the Preferences). To change a value, highlight the appropriate cell and type the desired resolution value, then press <Enter>. Pressing <Escape> will leave the current selection unchanged. Clicking **Apply To All** applies the currently selected value to every other card. If the resolution is changed for a card that has already been analysed, its name will

appear in red. Upon clicking the **Accept** button, Stainalysis will alert the user if any cards need to be re-analysed.

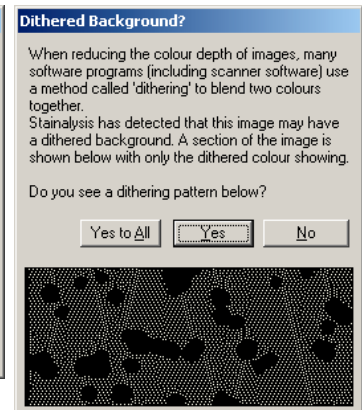
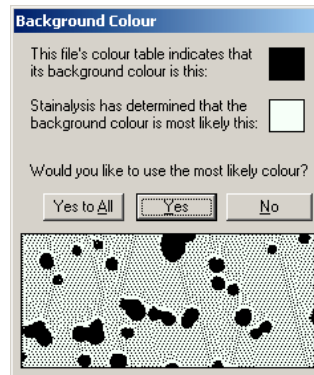


If the sample line location needs to be modified, the card-line positions can be changed by entering a new Card 1 Position and card spacing. When the <Accept> key is pressed, card-line positions will be adjusted relative to the flight line located at the 0 location.



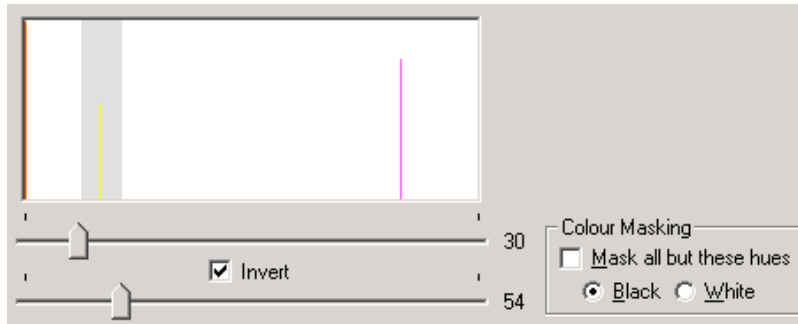
Scanning Image Colours

Pixel colours (dirt, other stains) can be discriminated against utilising a colour-notch filter. Before being analysed, each card must be 'colour scanned' in order for the colour-notch filter to work. Cards can be colour scanned on an individual basis by selecting the desired card then clicking the **Scan Colours** button, or all at once by clicking the **All** button. Stainalysis initially checks the file's indicated background colour against the most common colour in the picture; if they differ, Stainalysis will ask which colour to use. The most common colour should usually be used by clicking **Yes** or **Yes To All**. The picture is also checked for dithering. If found, Stainalysis can correct for it however the analysis process is severely slowed. A better solution is to turn off dithering in the scanner software and rescan the cards. Once colour scanning of the cards is finished, the various colour hues are displayed in the lower-left window (see image below). The frequency of each discrete hue in the currently selected card is plotted with respect to the most common hue found.



Using the slide bars under the colour-frequency window (or by left- and right-clicking in that window), the range of colours to be analysed by Stainalysis can be bracketed (colours to be analysed are shown in the white area). Checking the **Invert** box eliminates all colours between the slide bars (grey area), instead using colours that span both ends of the colour range.

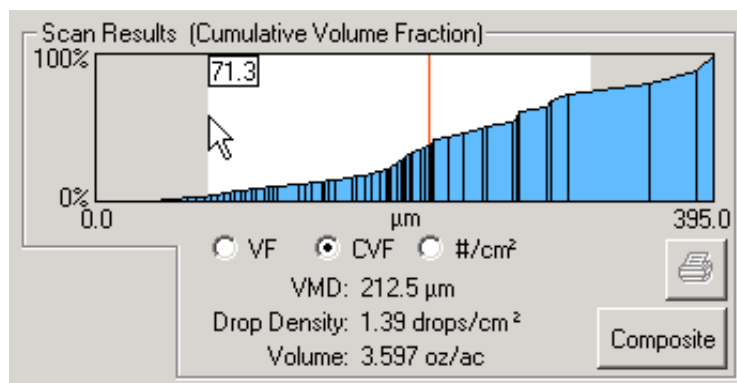
Better viewing discrimination may be achieved by masking all undesired colours. When **Mask all but these hues** is selected, Stainalysis will only display those colours in the main image window that fall within the selected colour range.



Stain Count **All** *Analysing Images*

Once the image colours have been scanned, cards can be analysed for stain size and count on an individual basis (**Stain Count**) or all at once (**All**). Utilising the spread factor information, stain size is transformed to drop diameter from which volume fraction, cumulative volume fraction and drop density are determined (see Appendix 1) as a function of drop size. The results for each of these three statistics are plotted in the histogram window, pictured below, based on the selected option (VF, CVF or $\#/cm^2$). The red vertical line in the histogram indicates the VMD. Volume median diameter, card average drop density and equivalent deposit volume are calculated and displayed below the histogram.

A range of droplet sizes can be selected from the histogram by clicking and dragging with the left and right mouse buttons in the histogram window (as seen in the image below). Values for VMD, drop density and volume (displayed below the histogram) are immediately updated, based on the selected range.



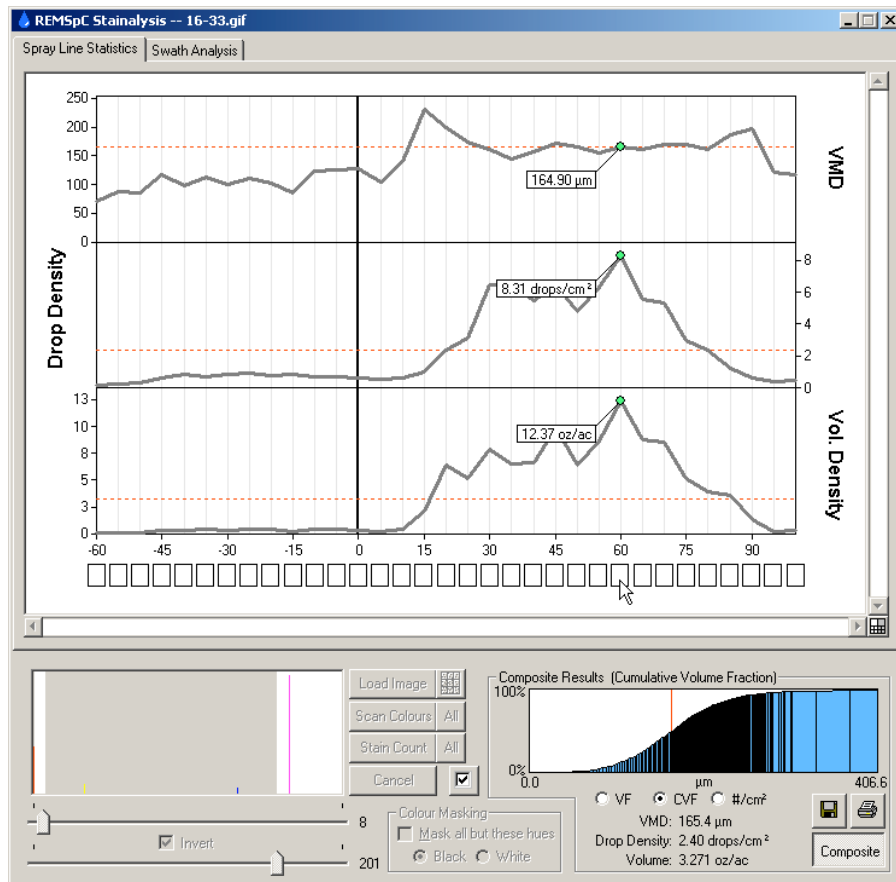


Multiple Card (Composite) Analysis

Activating the composite button provides access to swath analysis or graphs of spray line statistics.

Spray Line Statistics

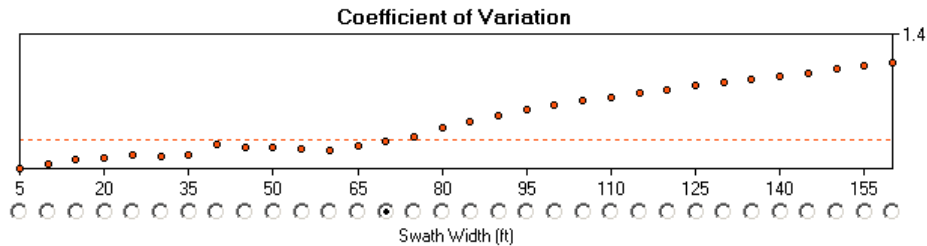
In the main image window, the upper graph represents VMD values along the sample line, the middle graph represents drop density and the lower graph represents deposit volume. Card data are referenced to spray-line averages where volume median diameter reflects the combination of all drop data into one data set while drop density and volume are the average of all cards within the deposit set. By moving the mouse pointer over a particular card (shown below the graphs in the main image window), the results for that card are displayed.



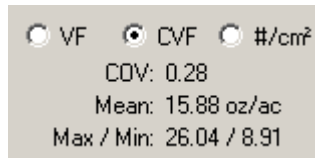
Swath Analysis

With the Swath Analysis function, the user can evaluate the impact of swath width on deposit variability across a block. A race-track application is assumed. Deposit (L/ha, oz/ac) or drop density (drops/unit area) variability can be viewed by choosing the appropriate radio button.

Coefficient of Variation

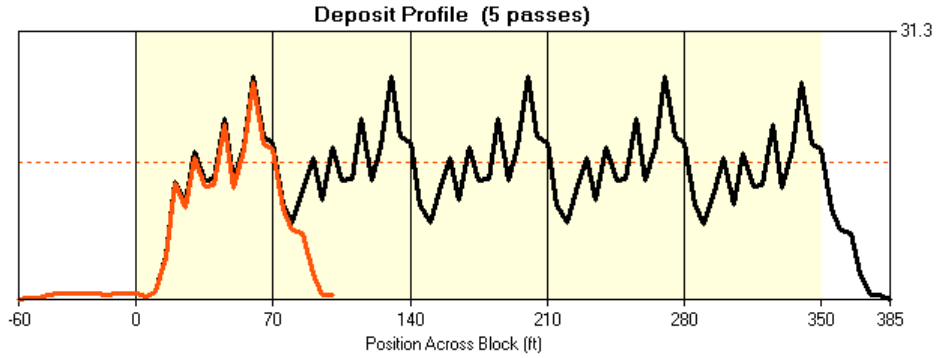


The coefficient of variation (COV) is plotted for each swath width ranging from the sampler separation to the length of the sample line. COVs are referenced to 0.3 (red line), the industry standard for acceptable deposit variability. Displayed below the Composite Results graph are the COV, average and maximum/minimum deposit. Coefficient of Variation and listed statistics are calculated for deposit near the centre of the block.



Deposit Profiles

Deposit (VF, CVF radio buttons) or number-density (#/cm² radio button) variability can be viewed for different swath widths. Flow rate and hence deposit is automatically scaled (using the swath width in Spray Information) in order to maintain a consistent application rate for the chosen swath width.



Selecting a swath width (radio button) produces a profile of deposit or drop density across a multi-swath block (indicated by the pale yellow background). Vertical lines reflect the flight lines across the block. Position '0' is the edge of the block and the first flight line location. Total deposit (thick black line) is plotted as well as the field data from a single pass (thick red line). By varying the swath (track spacing) and hence COV, the influence of overlapping swaths from adjacent treatment lines on deposit uniformity can be examined. Comparing block variability for deposit or drop density provides insight into the impact of different swath widths on these two parameters. Visualising deposit with respect to block boundaries provides insight into the need for a swath offset and/or overlapping spray lines in order to even out deposit on the upwind or downwind side of a block.



Saving Data to Output File

Saves composite results to a text file or comma-separated values (CSV) file (see Appendix 2). Output includes spray information, a summary of drop statistics on each of the deposit cards as well as the cumulative drop size distribution for the bulked set of cards. The swath analysis of deposit and drop density are detailed with the COV, Minimum, Mean and Maximum being listed for swath widths varying from sampler separation to the length of the total sample line. Swaths chosen for deposit and drop density are highlighted by ****. Deposit and drop density variation across the multi-swath block plot are also saved.

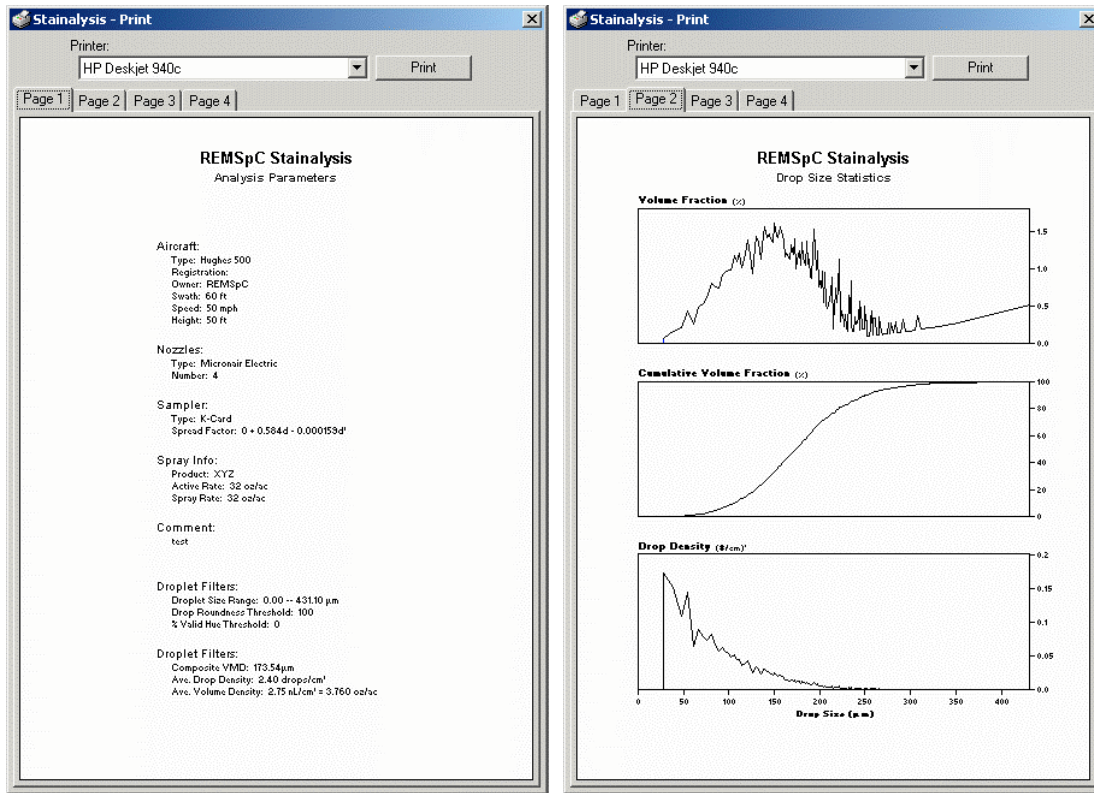
If a sub-range of drop sizes is selected from the Scan Results graph (used to isolate drop size range), each card's SCN file is also rewritten to reflect the drop size sub-range.

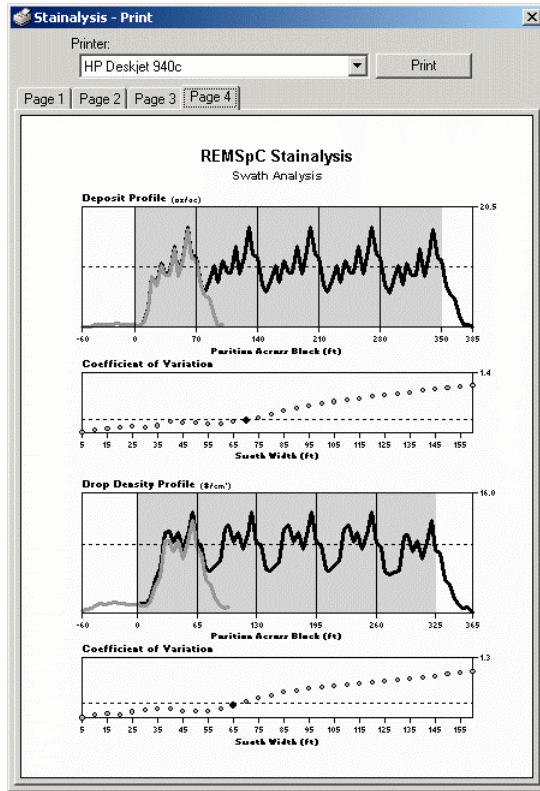
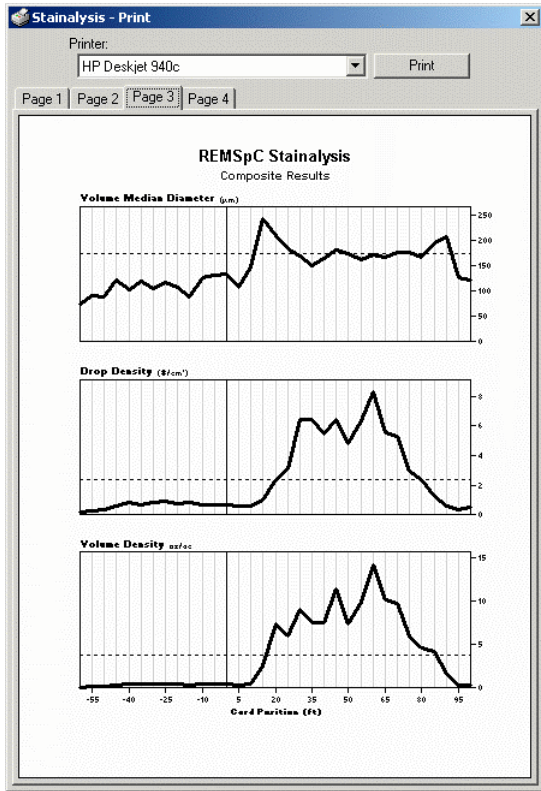


Printing Summary Analyses

Clicking the print button opens a print preview of each output page. Printed output includes

- Page 1 – Analysis Parameter summary
- Page 2 – Composite drop size statistics
- Page 3 – Line statistics
- Page 4 – Swath Analysis. COV and block variability of deposit and drop density for chosen swath widths.





Appendix 1
Single Card Results

Stainalysis -- REMSpC Droplet Analysis Program

File: 16-16.gif

Spray Information:

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Aircraft Type:           Hughes 500
Aircraft Registration:
Aircraft Owner:         REMSpC
Aircraft Swath:         60 ft
Aircraft Speed:         50 mph
Aircraft Height:        50 ft
Product Sprayed:        XYZ
Active Rate:             32 oz/ac
Spray Rate:              32 oz/ac
Nozzles:                 4x Micronair Electric
Analysis Device:         K-Card
Spread Factor:           0 + 0.584d + -0.000159d2
Sampler1 Position:      -60.0 ft
Sampler Separation:      5.0 ft
-----
    
```

Scan Information:

```

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Optical Resolution:      600 d.p.i.
Image Size:              8.12x10.93 cm
Hue Range:               0 to 5 and 203 to 255
VMD:                     116.6 μm
Drop Density:             0.89 drops/cm2
Volume:                  0.31 nL/cm2 = 0.421 oz/ac
-----
    
```

Results:

Area (pixels)	Count	Diameter (μm)	Volume Fraction%	Cumulative V.F. (%)	Drop Density (#/cm ²)	Number Fraction%	Cumulative N.F. (%)
1	13	27.534	0.52	0.52	0.146	16.46	16.46
2	12	38.727	1.33	1.85	0.135	15.19	31.65
3	5	47.230	1.01	2.86	0.056	6.33	37.97
4	10	54.343	3.07	5.94	0.113	12.66	50.63
5	1	60.565	0.43	6.36	0.011	1.27	51.90
6	2	66.156	1.11	7.47	0.023	2.53	54.43
7	3	71.269	2.08	9.55	0.034	3.80	58.23
8	5	76.002	4.20	13.76	0.056	6.33	64.56
9	2	80.425	1.99	15.75	0.023	2.53	67.09
10	1	84.590	1.16	16.91	0.011	1.27	68.35
11	3	88.533	3.99	20.89	0.034	3.80	72.15
12	1	92.284	1.51	22.40	0.011	1.27	73.42
13	2	95.867	3.37	25.77	0.023	2.53	75.95
14	2	99.301	3.75	29.53	0.023	2.53	78.48
16	1	105.783	2.27	31.79	0.011	1.27	79.75
17	3	108.854	7.41	39.20	0.034	3.80	83.54
18	1	111.826	2.68	41.88	0.011	1.27	84.81
19	2	114.706	5.78	47.66	0.023	2.53	87.34
21	2	120.221	6.66	54.32	0.023	2.53	89.87
22	1	122.866	3.55	57.87	0.011	1.27	91.14
26	2	132.814	8.97	66.85	0.023	2.53	93.67
27	1	135.161	4.73	71.57	0.011	1.27	94.94
29	1	139.708	5.22	76.80	0.011	1.27	96.20
32	1	146.199	5.98	82.78	0.011	1.27	97.47
34	1	150.330	6.51	89.29	0.011	1.27	98.73
49	1	177.500	10.71	100.00	0.011	1.27	100.00

Appendix 2
Composite Results

Stainalysis -- REMSpC Droplet Analysis Program
 Swath Deposit Analysis

 Spray Information:

 Aircraft Type: Hughes 500
 Aircraft Registration:
 Aircraft Owner: REMSpC
 Aircraft Swath: 60 ft
 Aircraft Speed: 50 mph
 Aircraft Height: 50 ft
 Product Sprayed: XYZ
 Active Rate: 32 oz/ac
 Spray Rate: 32 oz/ac
 Nozzles: 4x Micronair Electric
 Analysis Device: K-Card
 Spread Factor: 0 + 0.584d + -0.000159d²
 Sampler1 Position: -60.0
 Sampler Separation: 5.0
 Comment:

Results:

 Droplet Size Range: 0.00 -- 431.10 µm
 Selected Size Range: 0.00 -- 431.10 µm
 Drop Roundness: 100
 % Valid Hues: 0
 Composite VMD: 173.54 µm
 Ave. Drop Density: 2.40 drops/cm²
 Ave. Volume Density: 2.75 nL/cm² = 3.760 oz/ac

Card	Position (ft)	VMD (µm)	Drop Density (#/cm ²)	Deposit Volume (oz/ac)	Filename
1	-60	74.70	0.19	0.030	16-09.gif
2	-55	92.31	0.25	0.080	16-10.gif
3	-50	89.61	0.34	0.072	16-11.gif
4	-45	122.88	0.59	0.294	16-12.gif
5	-40	103.60	0.85	0.391	16-13.gif
6	-35	119.06	0.71	0.423	16-14.gif
7	-30	105.04	0.86	0.385	16-15.gif
8	-25	116.64	0.89	0.421	16-16.gif
9	-20	107.55	0.78	0.450	16-17.gif
10	-15	90.29	0.83	0.271	16-18.gif
11	-10	128.21	0.66	0.414	16-19.gif
12	-5	132.33	0.71	0.425	16-20.gif
13	0	133.70	0.65	0.392	16-21.gif
14	5	109.09	0.57	0.240	16-22.gif
15	10	147.90	0.61	0.460	16-23.gif
16	15	243.01	1.02	2.500	16-24.gif
17	20	210.62	2.37	7.377	16-25.gif
18	25	183.25	3.13	5.977	16-26.gif
19	30	168.78	6.45	9.006	16-27.gif
20	35	151.35	6.43	7.494	16-28.gif
21	40	164.13	5.45	7.566	16-29.gif
22	45	181.25	6.43	11.334	16-30.gif
23	50	174.29	4.81	7.342	16-31.gif
24	55	161.62	6.33	9.924	16-32.gif
25	60	172.95	8.31	14.210	16-33.gif
26	65	168.60	5.53	10.101	16-34.gif
27	70	177.56	5.34	9.777	16-35.gif
28	75	178.14	2.97	5.907	16-36.gif
29	80	168.32	2.39	4.546	16-37.gif
30	85	196.67	1.23	4.170	16-38.gif
31	90	207.54	0.59	1.546	16-39.gif

32	95	126.93	0.36	0.245	16-40.gif
33	100	123.48	0.50	0.305	16-41.gif

Diameter (μm)	Count	Volume Fraction%	Cumulative V.F. (%)	Drop Density (#/cm ²)	Number Fraction%	Cumulative N.F. (%)
27.500	504	0.07	0.07	0.172	7.18	7.18
38.700	440	0.17	0.23	0.150	6.27	13.45
47.200	316	0.22	0.45	0.108	4.50	17.95
54.300	420	0.44	0.89	0.143	5.98	23.94
60.600	187	0.27	1.16	0.064	2.66	26.60
66.200	261	0.49	1.65	0.089	3.72	30.32
71.300	227	0.54	2.19	0.078	3.23	33.55
76.000	215	0.61	2.80	0.073	3.06	36.61
80.400	239	0.81	3.61	0.082	3.41	40.02
84.600	194	0.76	4.37	0.066	2.76	42.78
88.500	164	0.74	5.11	0.056	2.34	45.12
92.300	180	0.92	6.04	0.061	2.56	47.68
95.900	167	0.96	6.99	0.057	2.38	50.06
99.300	154	0.98	7.98	0.053	2.19	52.26
102.600	140	0.98	8.96	0.048	1.99	54.25
105.800	153	1.18	10.14	0.052	2.18	56.43
108.900	131	1.10	11.24	0.045	1.87	58.30
111.800	132	1.20	12.44	0.045	1.88	60.18
114.700	103	1.01	13.45	0.035	1.47	61.65
117.500	115	1.21	14.67	0.039	1.64	63.29
120.200	123	1.39	16.06	0.042	1.75	65.04
122.900	99	1.20	17.25	0.034	1.41	66.45
125.400	73	0.94	18.19	0.025	1.04	67.49
128.000	83	1.13	19.32	0.028	1.18	68.67
130.400	99	1.43	20.75	0.034	1.41	70.08
132.800	89	1.36	22.11	0.030	1.27	71.35
135.200	70	1.13	23.23	0.024	1.00	72.35
137.500	87	1.47	24.71	0.030	1.24	73.59
139.700	88	1.56	26.27	0.030	1.25	74.84
141.900	76	1.41	27.68	0.026	1.08	75.92
144.100	75	1.46	29.14	0.026	1.07	76.99
146.200	69	1.40	30.54	0.024	0.98	77.97
148.300	64	1.36	31.90	0.022	0.91	78.89
150.300	73	1.61	33.52	0.025	1.04	79.93
152.300	63	1.45	34.96	0.022	0.90	80.82
154.300	59	1.41	36.37	0.020	0.84	81.66
156.300	63	1.57	37.94	0.022	0.90	82.56
158.200	58	1.49	39.43	0.020	0.83	83.39
160.100	52	1.39	40.82	0.018	0.74	84.13
161.900	42	1.16	41.98	0.014	0.60	84.73
163.800	42	1.20	43.18	0.014	0.60	85.33
165.600	39	1.15	44.34	0.013	0.56	85.88
167.300	37	1.13	45.47	0.013	0.53	86.41
169.100	42	1.32	46.79	0.014	0.60	87.01
170.800	37	1.20	47.99	0.013	0.53	87.53
172.500	42	1.40	49.39	0.014	0.60	88.13
174.200	29	1.00	50.39	0.010	0.41	88.55
175.900	34	1.20	51.59	0.012	0.48	89.03
177.500	34	1.24	52.83	0.012	0.48	89.51
179.100	28	1.05	53.88	0.010	0.40	89.91
180.700	35	1.34	55.22	0.012	0.50	90.41
182.300	29	1.14	56.36	0.010	0.41	90.82
183.900	26	1.05	57.42	0.009	0.37	91.20
185.400	33	1.37	58.78	0.011	0.47	91.67
186.900	25	1.06	59.85	0.009	0.36	92.02
188.400	26	1.13	60.98	0.009	0.37	92.39
189.900	20	0.89	61.87	0.007	0.28	92.68
191.400	19	0.87	62.74	0.006	0.27	92.95
192.900	26	1.21	63.95	0.009	0.37	93.32
194.300	32	1.53	65.48	0.011	0.46	93.77
195.800	20	0.98	66.46	0.007	0.28	94.06

197.200	25	1.25	67.70	0.009	0.36	94.42
198.600	15	0.76	68.47	0.005	0.21	94.63
200.000	16	0.83	69.30	0.005	0.23	94.86
201.300	14	0.74	70.05	0.005	0.20	95.06
202.700	18	0.98	71.02	0.006	0.26	95.31
204.000	10	0.55	71.57	0.003	0.14	95.46
205.400	17	0.96	72.53	0.006	0.24	95.70
206.700	9	0.52	73.05	0.003	0.13	95.83
208.000	8	0.47	73.52	0.003	0.11	95.94
209.300	9	0.54	74.06	0.003	0.13	96.07
210.600	10	0.61	74.66	0.003	0.14	96.21
211.900	11	0.68	75.34	0.004	0.16	96.37
213.100	14	0.88	76.23	0.005	0.20	96.57
214.400	3	0.19	76.42	0.001	0.04	96.61
215.600	9	0.59	77.01	0.003	0.13	96.74
216.900	9	0.60	77.60	0.003	0.13	96.87
218.100	11	0.74	78.35	0.004	0.16	97.02
219.300	8	0.55	78.89	0.003	0.11	97.14
220.500	11	0.77	79.66	0.004	0.16	97.29
221.700	16	1.13	80.80	0.005	0.23	97.52
222.900	4	0.29	81.09	0.001	0.06	97.58
224.000	6	0.44	81.52	0.002	0.09	97.66
225.200	5	0.37	81.90	0.002	0.07	97.73
226.400	4	0.30	82.20	0.001	0.06	97.79
227.500	3	0.23	82.43	0.001	0.04	97.83
228.600	5	0.39	82.82	0.002	0.07	97.91
229.800	3	0.24	83.05	0.001	0.04	97.95
230.900	2	0.16	83.21	0.001	0.03	97.98
232.000	8	0.65	83.86	0.003	0.11	98.09
233.100	5	0.41	84.28	0.002	0.07	98.16
234.200	10	0.84	85.11	0.003	0.14	98.30
235.300	3	0.25	85.37	0.001	0.04	98.35
236.400	2	0.17	85.54	0.001	0.03	98.38
237.400	2	0.17	85.71	0.001	0.03	98.40
238.500	4	0.35	86.07	0.001	0.06	98.46
239.600	3	0.27	86.33	0.001	0.04	98.50
240.600	3	0.27	86.61	0.001	0.04	98.55
241.700	3	0.28	86.88	0.001	0.04	98.59
242.700	4	0.37	87.25	0.001	0.06	98.65
243.700	6	0.57	87.82	0.002	0.09	98.73
244.700	2	0.19	88.01	0.001	0.03	98.76
245.800	5	0.48	88.49	0.002	0.07	98.83
246.800	2	0.20	88.69	0.001	0.03	98.86
247.800	2	0.20	88.89	0.001	0.03	98.89
248.800	2	0.20	89.09	0.001	0.03	98.92
249.700	5	0.51	89.59	0.002	0.07	98.99
250.700	3	0.31	89.90	0.001	0.04	99.03
251.700	3	0.31	90.21	0.001	0.04	99.07
252.700	1	0.11	90.32	0.000	0.01	99.09
253.600	1	0.11	90.42	0.000	0.01	99.10
254.600	1	0.11	90.53	0.000	0.01	99.12
255.600	2	0.22	90.75	0.001	0.03	99.15
256.500	3	0.33	91.08	0.001	0.04	99.19
257.400	4	0.44	91.52	0.001	0.06	99.24
258.400	1	0.11	91.63	0.000	0.01	99.26
259.300	3	0.34	91.98	0.001	0.04	99.30
260.200	3	0.34	92.32	0.001	0.04	99.34
261.100	3	0.35	92.67	0.001	0.04	99.39
262.100	1	0.12	92.78	0.000	0.01	99.40
263.000	1	0.12	92.90	0.000	0.01	99.42
263.900	1	0.12	93.02	0.000	0.01	99.43
264.800	1	0.12	93.14	0.000	0.01	99.44
265.700	3	0.37	93.51	0.001	0.04	99.49
266.500	2	0.25	93.76	0.001	0.03	99.52
269.200	1	0.13	93.88	0.000	0.01	99.53
270.000	1	0.13	94.01	0.000	0.01	99.54
272.600	1	0.13	94.14	0.000	0.01	99.56

275.200	1	0.14	94.28	0.000	0.01	99.57
276.000	2	0.27	94.55	0.001	0.03	99.60
277.600	1	0.14	94.69	0.000	0.01	99.62
278.500	2	0.28	94.97	0.001	0.03	99.64
280.900	1	0.14	95.12	0.000	0.01	99.66
281.700	1	0.15	95.26	0.000	0.01	99.67
283.300	2	0.30	95.56	0.001	0.03	99.70
285.700	1	0.15	95.71	0.000	0.01	99.72
286.500	1	0.15	95.86	0.000	0.01	99.73
287.200	1	0.15	96.02	0.000	0.01	99.74
289.600	1	0.16	96.17	0.000	0.01	99.76
291.800	2	0.32	96.50	0.001	0.03	99.79
294.800	1	0.17	96.67	0.000	0.01	99.80
297.000	1	0.17	96.84	0.000	0.01	99.81
297.800	1	0.17	97.01	0.000	0.01	99.83
299.200	1	0.17	97.18	0.000	0.01	99.84
305.500	1	0.19	97.37	0.000	0.01	99.86
308.300	2	0.38	97.75	0.001	0.03	99.89
311.700	1	0.20	97.95	0.000	0.01	99.90
313.000	1	0.20	98.15	0.000	0.01	99.91
320.700	1	0.21	98.36	0.000	0.01	99.93
321.300	1	0.22	98.58	0.000	0.01	99.94
323.200	1	0.22	98.80	0.000	0.01	99.96
353.500	1	0.29	99.08	0.000	0.01	99.97
394.900	1	0.40	99.48	0.000	0.01	99.99
431.100	1	0.52	100.01	0.000	0.01	100.00

Swath Analysis:

Swath Width (ft)	----- Deposit (oz/ac) -----				--- Drop Density (#/cm ²) ---			
	COV	Mean	Max	Min	COV	Mean	Max	Min
5	0.00	144.75	144.75	144.75	0.00	126.30	126.30	126.30
10	0.05	72.38	74.98	69.77	0.06	63.15	65.67	60.63
15	0.10	48.25	53.52	45.09	0.08	42.10	46.11	40.08
20	0.12	36.19	41.15	31.74	0.06	31.57	34.29	29.83
25	0.15	28.95	34.56	23.82	0.13	25.26	29.14	21.23
30	0.12	24.13	29.83	21.68	0.16	21.05	27.21	17.68
35	0.15	20.68	24.66	16.45	0.19	18.04	22.39	12.90
40	0.26	18.09	26.10	11.36	0.20	15.79	20.41	10.96
45	0.23	16.08	20.88	9.59	0.14	14.03	16.67	10.53
50	0.22	14.48	20.46	9.46	0.15	12.63	15.59	10.06
55	0.20	13.16	16.94	9.10	0.15	11.48	14.72	9.12
60	0.19	12.06	17.07	9.05	0.20	10.52	14.62	7.30
65	0.24	11.13	17.07	7.52	***0.27	9.72	14.40	5.97
70	***0.29	10.34	17.06	5.87	0.35	9.02	14.33	3.98
75	0.35	9.65	16.89	4.76	0.43	8.42	14.60	2.86
80	0.43	9.05	17.10	2.34	0.49	7.89	14.51	1.91
85	0.50	8.51	17.07	0.82	0.55	7.43	14.69	1.55
90	0.56	8.04	17.03	0.57	0.59	7.02	14.64	1.49
95	0.62	7.62	17.07	0.54	0.63	6.65	14.40	0.97
100	0.67	7.24	17.03	0.28	0.67	6.31	14.62	0.92
105	0.71	6.89	16.92	0.28	0.69	6.01	14.20	0.92
110	0.75	6.58	16.66	0.28	0.72	5.74	13.81	0.92
115	0.79	6.29	16.67	0.28	0.74	5.49	13.66	0.92
120	0.83	6.03	16.61	0.28	0.76	5.26	13.57	0.92
125	0.87	5.79	16.58	0.28	0.79	5.05	13.27	0.92
130	0.90	5.57	16.58	0.28	0.81	4.86	13.27	0.92
135	0.94	5.36	16.58	0.28	0.84	4.68	13.27	0.92
140	0.97	5.17	16.58	0.28	0.87	4.51	13.27	0.92
145	1.01	4.99	16.58	0.28	0.91	4.36	13.27	0.92
150	1.04	4.83	16.58	0.28	0.94	4.21	13.27	0.92
155	1.07	4.67	16.58	0.08	0.97	4.07	13.27	0.54
160	1.10	4.52	16.58	0.08	1.00	3.95	13.27	0.40

Multiswath Profiles:

 Block Size: 0-350ft 0-325ft

Position (ft)	Deposit (oz/ac)	Drop Density (#/cm ²)
-60	0.022	0.192
-55	0.058	0.248
-50	0.052	0.338
-45	0.215	0.586
-40	0.286	0.846
-35	0.309	0.710
-30	0.282	0.858
-25	0.308	0.890
-20	0.329	0.778
-15	0.198	0.834
-10	0.302	0.665
-5	0.310	0.710
0	0.287	0.654
5	0.176	0.766
10	0.358	0.857
15	1.886	1.353
20	5.445	2.952
25	4.584	3.977
30	6.870	7.155
35	5.787	7.285
40	5.812	6.343
45	8.593	7.212
50	5.696	5.649
55	7.452	6.997
60	10.689	9.023
65	7.694	6.186
70	7.434	6.107
75	4.493	3.831
80	3.681	3.742
85	4.934	4.181
90	6.575	4.564
95	4.763	7.516
100	7.093	7.782
105	5.787	6.343
110	5.812	7.212
115	8.593	5.649
120	5.696	6.997
125	7.452	9.023
130	10.689	6.186
135	7.694	6.107
140	7.434	3.831
145	4.493	3.742
150	3.681	4.181
155	4.934	4.564
160	6.575	7.516
165	4.763	7.782
170	7.093	6.343
175	5.787	7.212
180	5.812	5.649
185	8.593	6.997
190	5.696	9.023
195	7.452	6.186
200	10.689	6.107
205	7.694	3.831
210	7.434	3.742
215	4.493	4.181
220	3.681	4.564
225	4.934	7.516
230	6.575	7.782
235	4.763	6.343
240	7.093	7.212

245	5.787	5.649
250	5.812	6.997
255	8.593	9.023
260	5.696	6.186
265	7.452	5.915
270	10.689	3.583
275	7.694	3.404
280	7.434	3.595
285	4.493	3.718
290	3.659	6.807
295	4.876	6.924
300	6.523	5.453
305	4.548	6.434
310	6.807	4.815
315	5.478	6.332
320	5.531	8.313
325	8.285	5.532
330	5.367	5.341
335	7.254	2.975
340	10.387	2.389
345	7.384	1.229
350	7.147	0.587
355	4.318	0.361
360	3.323	0.497
365	3.048	0.000
370	1.130	0.000
375	0.179	0.000
380	0.223	0.000
385	0.000	0.000