



Surface material sample EWLS site 23 in 2009 prior to samples being collected.



Surface material sample EWLS site 23 in 2010.

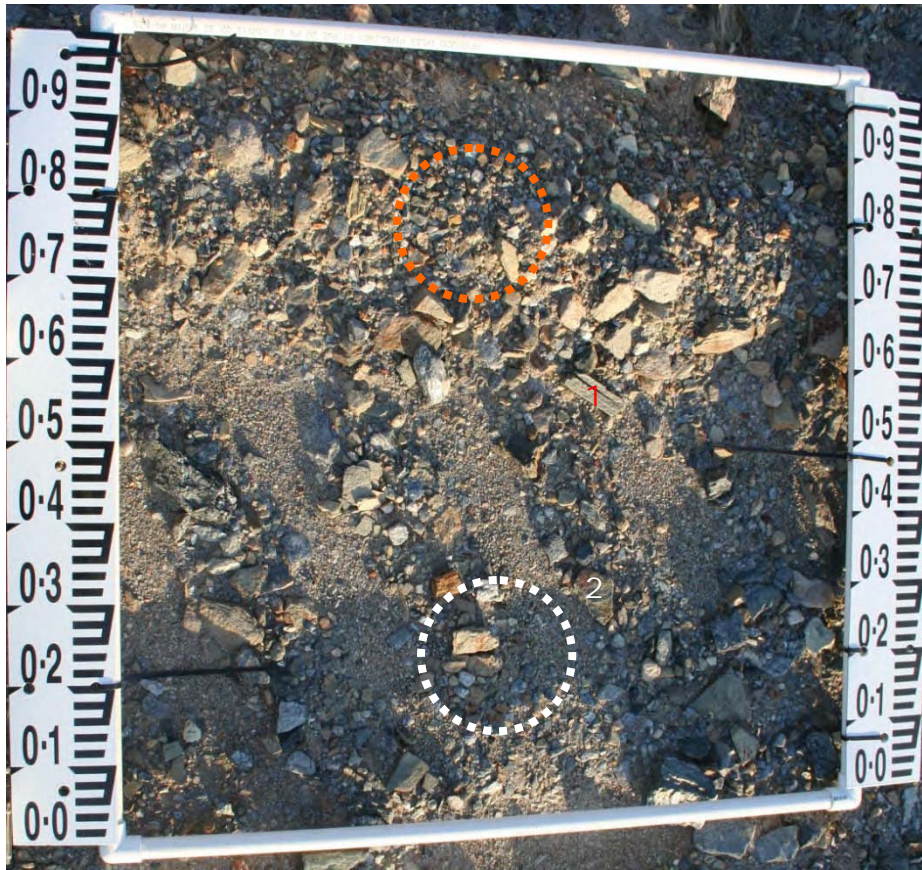
Surface material sample EWLS site 25



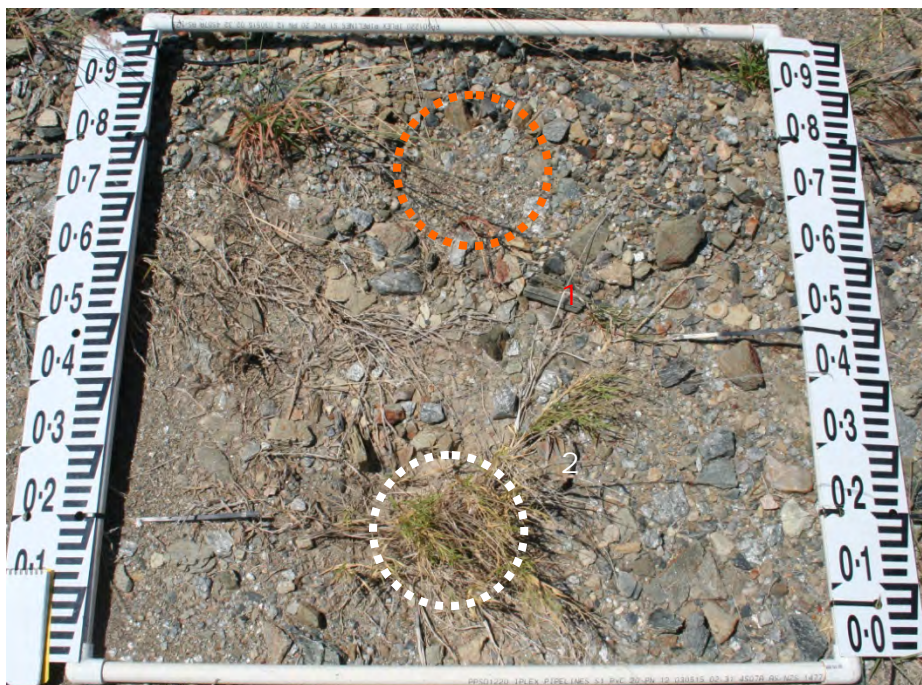
Surface material sample EWLS site 25. Oblique image of the samples collected in 2009. The image is taken looking south west across the landform.

GPS location: 12.681110E, 132.897050S

Treatment: Waste Rock & lateritic material (2 m) with direct seeding.



Surface material sample EWLS site 25 in 2009 prior to samples being collected.



Surface material sample EWLS site 25 in 2010.

Grass has grown in the hole that was sampled between the rips and there are other tufts of grass as well.

Surface material sample EWLS site 28



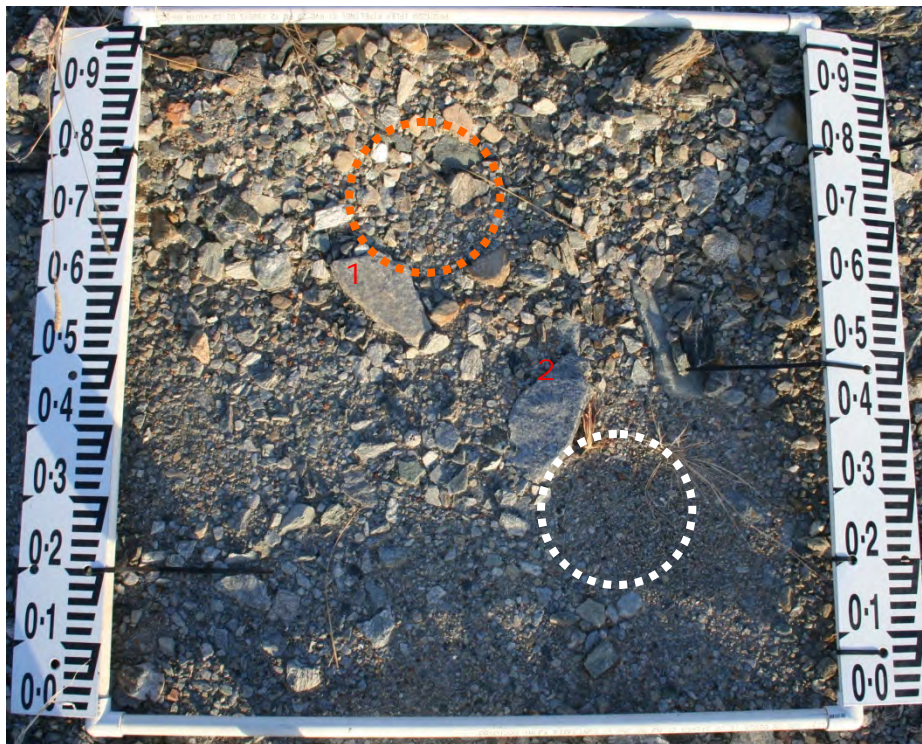
Surface material sample EWLS site 28. Oblique image of the samples collected in 2009. The image is taken looking south west across the landform.

GPS location: 12.681740E, 132.896560S

Treatment: Waste Rock & lateritic material (5 m) with direct seeding.



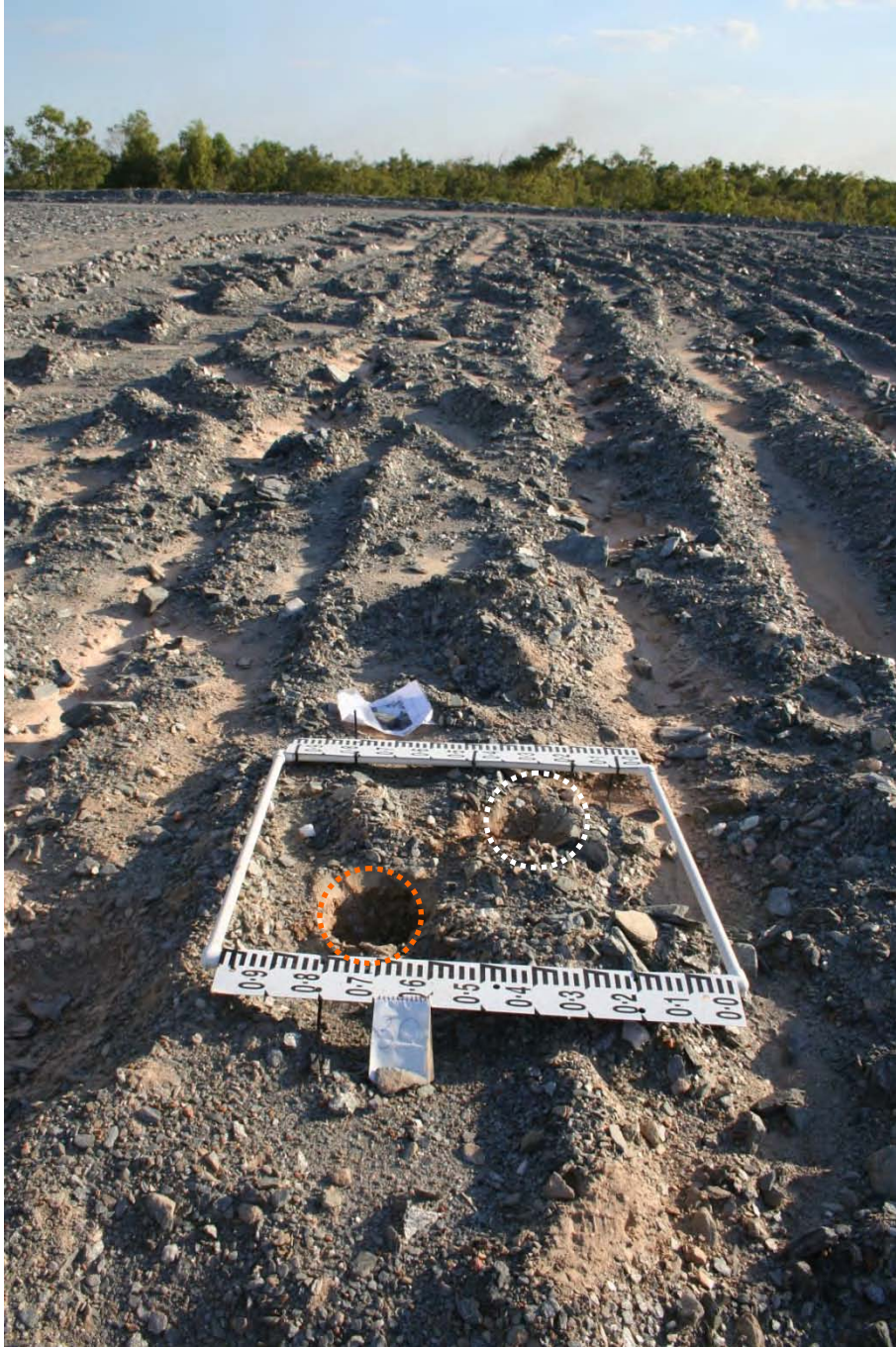
Surface material sample EWLS site 28 in 2009 prior to samples being collected.



Surface material sample EWLS site 28 in 2010.

There are a couple of tufts of grass (dead) in the 2010 image.

Surface material sample EWLS site 30



Surface material sample EWLS site 30. Oblique image of the samples collected in 2009. The image is taken looking south west across the landform.

GPS location: 12.680420E, 132.895680S

Treatment: Waste Rock & lateritic material (5 m) with direct seeding.



Surface material sample EWLS site 30 in 2009 prior to samples being collected.



Surface material sample EWLS site 30 in 2010.

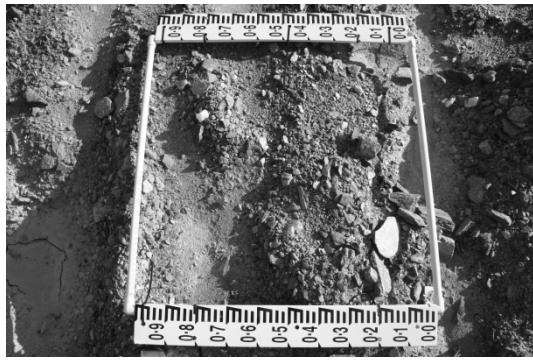
Both of the samples were collected between the rips and both have been infilled with fine material.

4.2 Digital Gravelometer™ results

Up to eight vertical images were taken at each of the 12 sample sites, before sample collection. The images were then analysed using the Digital Gravelometer™ using two approaches. Firstly, multiple images were analysed individually and secondly, multiple images were analysed simultaneously and the results aggregated. The aggregated results usually conformed to the average of the individual results and have been used in this report. For the Digital Gravelometer™ results contained in this report the default parameter settings adopted by the program were used.

The Digital Gravelometer™ was only able to determine particle sizes with b-axis diameters greater than 0.7 mm (0.5 ϕ). It was hoped that this method could be used in future years to determine particle size at each sample location without having to collect a sample for time consuming particle size analysis using the sieve and hydrometer methods. In addition such a method is non-destructive in that there is no physical disturbance of the surface that could influence future behaviour. During the analysis undertaken by the Digital Gravelometer™ the following 6 images shown in Figure 7 were generated for site 30.

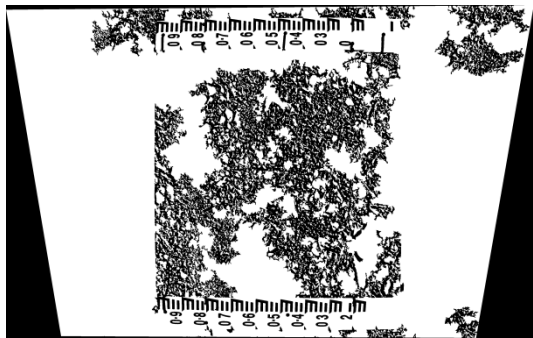
After initially looking at all of the images (Figure 7) for one of the sites it was decided that for each site only the grains selected (Figure 7A) and the final overlay (Figure 7F) would be generated. These images highlighted several problems with the Digital Gravelometer™ software, including false classification resulting from uneven ground, shadows, variations or striations in the rocks, differences in surface texture of clasts, etc. Several images illustrating these problems are shown below.



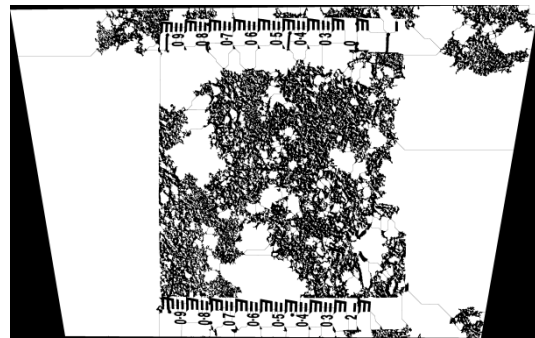
A Greyscale – convert colour image to greyscale



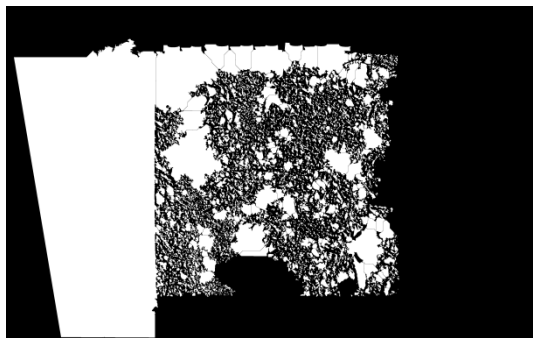
B Transformed – Uses known scale points to transform the image to a true scale



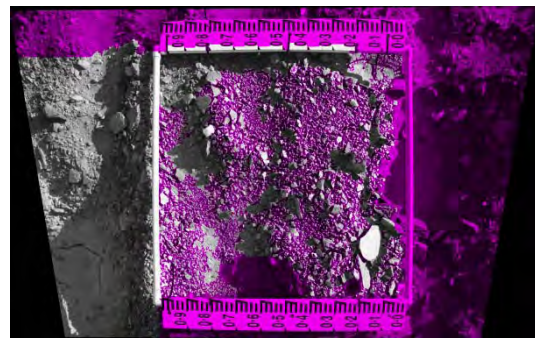
C Grains – Initial identification of grains



D Watershed segmented grains – Attempts to divide the larger grains into several smaller grains

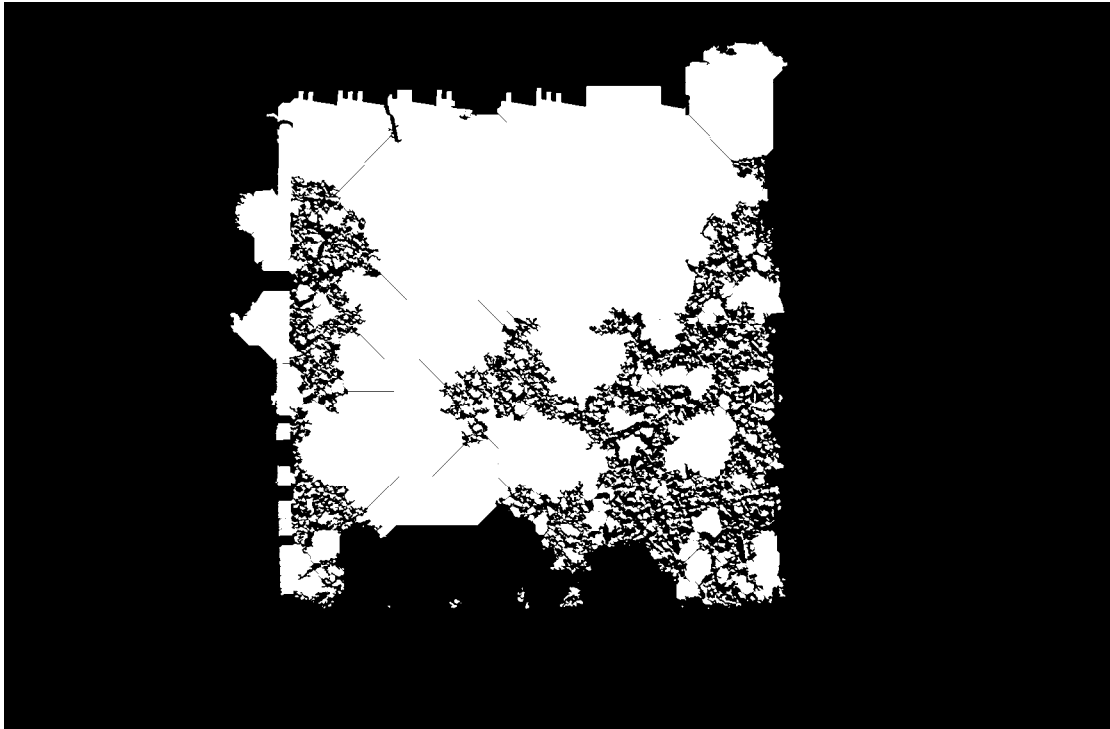


E - Grains selected – shows the grains that it has used

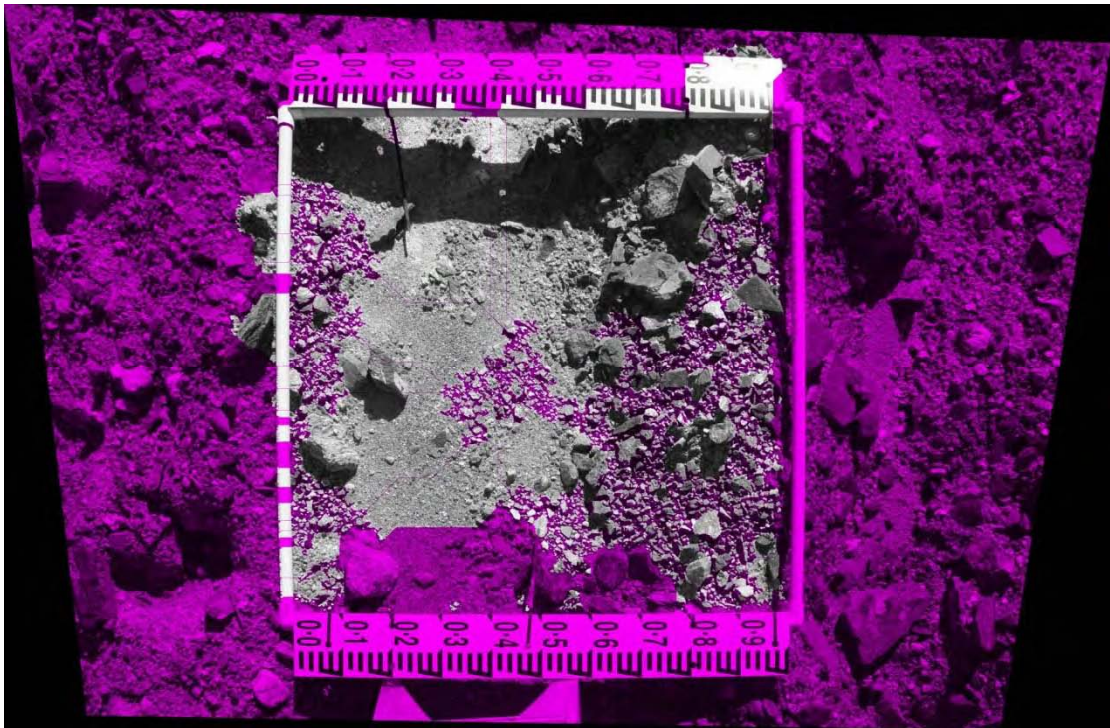


F - Greyscale image overlaid on grains selected – shows the actual grains selected overlaid on to the transformed greyscale image

Figure 7 Images showing the various images that are generated during the measurement process



Surface material sample EWLS site 6 showing image of grains that have been selected.



Surface material sample EWLS site 6 final image of grains selected overlying the transformed greyscale image. Where there is fine material (< 2.0 mm) these have been grouped together to form several large clasts. This area does contain large clasts, however, they have not been determined. They have also been grouped with shadows from the surrounding frame. Also the scale bar on the outside of the frame has been determined as large clasts. Several of the smaller clasts in the middle of the image have been determined appropriately.