ON FALLOUT DUST SAMPLING

ASPASA About Face 2017 has included ambient (fallout dust) sampling and reporting as a Focus Area. Following the About Face Audits in the Western Cape where shortcomings in fall-out dust sampling equipment were noted at a number of ASPASA Member operations, a local Manager submitted the About Face Audit findings to a service provider for rectification. He received the following reply from the service provider:

"Please can you send me findings of the audit. We can then make plans to replace the units to meet the requirements they are wanting.

I look forward to seeing the findings so that we can comment".

This message was forwarded to Alan Cluett, the ASPASA About Face Auditor asking for advice. Alan has replied as follows

"In reference to the attached email:

Simply: The requirements for Fall-out Dust Deposition determinations (NEM:AQA 39 of 2004) are specified in Section *4.11 of SANS 1929:2011 "Dust Deposition"* and through requirement *4.11.4 "The reference method for measuring dustfall shall be the ASTMD1739"*, which is also specified in the Normative Reference of SANS1929:2011 as an *"indispensable"* document. Provision is also made for the use of alternatives methods but only as approved in writing by the authorities.

ASTM specifies the bucket size as:

7. Apparatus 7.1 Container—An open-topped cylinder not less than 150 mm [6 in.] in diameter with height not less than twice its diameter. Containers should be made of stainless steel or weatherproof plastic. They shall be capable of accepting legible, weatherproof, identification markings. A tight-fitting lid is needed for each container.

ASPASA Auditor comment: Commercially available 5 litre buckets do not meet this requirement.

ASTM specifies the height and windshield design (Height included below):

7.2 Stand, for the container, which will hold the top of the container at a height of 2 m above ground. It will also include a wind shield constructed in accordance with Figs. 1 and 2. Experiments reported in Kohler and Fleck (2) indicate that much better precision is obtained when this simple aerodynamic shield is provided, and that there is a wide variability in the concentration of particles subject to settling at heights of less than 2 m.

ASPASA Auditor comment: Across the industry bucket heights vary from 1 metre to 2.5 metres above ground. Wind-shields comprise of windshields constructed as per the ASTM Specifications through to 'bird-rings'.

Location of Dust Buckets

Annexure A of SANS1929:2011 also details on page 13 *"Macroscale siting of Dustfall sampling points"* and ASTM requirements 9.1.1.1 through to 9.1.3.

If required I can expand on this.

On the use of the “Directional Buckets”, Cluett comments that “the four-bucket units commonly utilised in our industry have some basic design faults that, if utilised in isolation, will result in an under-determination of the fallout at the measuring point. See attached photo that will need no explanation. Such a directional bucket system must be utilised in conjunction with a single standard bucket (multi-directional bucket) despite the latter being labeled as ‘crude’. The latter will give the total fallout at that point whilst the former will enable the identification of the respective and majority source direction.

Cluett continues that during the ASPASA About Face Audits additional problems commonly identified with the Directional Buckets include:

1. Wind vanes do not spin freely in light wind conditions thereby causing inaccurate deposition from the wrong quarter; or,
2. Stands are not level resulting in the vane being affected by gravity and, again, leading to an incorrect collection; or,
3. In the case of one quarry, the unit was poorly located such that the vane was stuck against the fence and simply could not move.

Cluett added that “It is surprising that any service provider would make the following request *“Please can you send me findings of the audit. We can then make plans to replace the units to meet the requirements they are wanting”.* Simply put the sampling units should meet the nationally prescribed standard (SANS1929:2011/ASTM D1379)!” Concluding “At the end or the day the Dust Sampling method and report may be utilised in the Mine Managers defence in community conflict situations or even in a court of law. Accordingly, the entire sampling process needs to be professional and able to withstand scrutiny”.

ASPASA will be running a series of ‘Flash Training Workshops’ on **Fallout Dust Sampling** and **Water Quality Sampling** across all regions in the second half of 2017.