

Bioresources - Tankered Trade Waste			
Document Title	SOP14 Moisture Content Sampling Procedure		
Document Owner Role	TTW Manager	Version Number	2.0
Date of Last Review	03/03/2022	Date of next Review	03/03/2024
Identified Risks			
<ul style="list-style-type: none"> • HS&W risks associated with unsuitable / volatile / hazardous waste streams. • Excessive solids could damage the pipework infrastructure • Activated Sludge Process lanes collapse: from Overloading of nutrients <ul style="list-style-type: none"> ○ Inhibition of the microbial activity through the introduction of too many inhibitory compounds such as metals or cyanide or pH concentrations are too extreme • Digestors inhibits Methane (CH₄) generation due to: <ul style="list-style-type: none"> ○ excessive volume of heavy metals such as Chromium (Cr III) and Cadmium (Cd) ○ They can poison the active bacteria and inhibit the methanogenic bacteria ○ This leads the presence of organic acids • Combined Heat Power process impacted by: <ul style="list-style-type: none"> ○ High concentrations of Hydrogen Sulphide (H₂S) can damage engines ○ High concentrations of Siloxanes (Si) pas through the biogas and result in silica deposits. ○ These damage the engine valves, oil life etc leading to greater downtime and more equipment to be replaced • Compliance risks • Loss of waste permits if waste not listed on them permitted or waste does not have the appropriate EWC. • Final effluent discharge consents missed due to high solids or heavy metals or Phosphorus (P) • BAS Compliance for Biosolids non-conforming if too high metal content • Wider environmental damage from failures of the treatment processes due to unsuitable waste streams being accepted. 			
<p>If this is a printed version, please ensure that it is still within the current review period, if not 'DO NOT USE' and contact your line manager for a new version</p>			
<p>Remember – If you can't do the job safely, don't do it. 'DO NOT CARRY OUT THE PROCEDURE' And seek advice from your line manager</p>			

Introduction
The moisture content of the rag waste is analysed for the site operators and the result is used for tax relief purposes.

Key Roles and Responsibilities	
Tankered Trade Waste Manager (TWM):	<ul style="list-style-type: none"> ○ Ensure that the operating procedures are followed ○ Ensure that the Tankered Trade Waste Technicians (TTWT) have undergone appropriate training ○ Can make approval decisions if they have been deemed as technically competent ○ Investigate HSW & Environmental concerns from the TTWT
Tankered Process Team (TPT):	<ul style="list-style-type: none"> ○ Ensure that the operating procedures are followed ○ Ensure that the Tankered Trade Waste Technicians (TTWT) have undergone appropriate training ○ Can make approval decisions if they have been deemed as technically competent ○ Investigate HSW & Environmental concerns from the TTWT
Tankered Trade Waste Technicians (TTWT)/Technical Competent Persons(TCP):	<ul style="list-style-type: none"> ○ TTWT have undergone appropriate training and have a valid CMS certificate ○ Follow H&S protocols ○ TTWT have been deemed as technically competent ○ Ensure the rag sample can be obtained safely

Required Training	
Tankered Trade Waste Technicians (TTWT)	<ul style="list-style-type: none"> ● In date EMS training ● Ability to operate DS (dry solids) analysis machine ● Experience undertaking sampling and lab testing ● Data entry on SharePoint
Tankered Process Team (TPT)	<p>The requirements for the TTWT in addition to:</p> <ul style="list-style-type: none"> ● Tankered Waste experience or 12 months experience in the waste industry ● CIWM Hazardous Waste Classification course ● Cranfield University Biological Processes/Activated Sludge Treatment course ● University degree or similar level of experience and knowledge in a Scientific Area
Tankered Trade Waste Manager (TWM):	<ul style="list-style-type: none"> ● In date CMS training ● Experience of working in the Waste Industry ● Understanding of Health, Safety, Wellbeing and Environmental Compliance

Documentation & Resources
<ul style="list-style-type: none"> ● PPE: Hard hat/bump cap, Hi visibility vest or jacket, Safety boots, Gloves, Eye protection, Ear protection and heavy-duty gloves ● SharePoint ● DS Analyser machine and instructions for use ● Sample containers

Obtaining a sample

A Rag sample should be taken every three months. All TTWTs should have a reminder on outlook calendar when the sampling is due. The rag sample is taken from various places depending which sewage treatment site it is taken from. This can vary from a skip, Huber screen or a compactor skip. If the sample is taken from a compactor skip or a Huber screen the chemist will ask a site operator, who has been trained to operate the compactors and Huber screens to retrieve a sample.

If the sample is taken from a skip that can be accessed safely, the site chemist can retrieve the sample and put it into a glass or plastic container. All technicians must wear full PPE including thick protective gloves whilst undertaking the task.

Testing Precautions

- Parts of the DS analyser are very hot when a measurement finishes. For operation, use the specified grips of the heater cover and pan handle. Use the standard accessory tools (A&D MF-50 Instruction Manual 2012 – 2020).
- Do not touch the heater cover, the halogen lamp, glass-housing, pan handle, sample pan or sample without adequate protection because it could cause a burn or scald

Precautions for Measurement Safety

- Do not install the analyser in a dangerous place.
- Maintain an ambient condition of 5°C to 40°C (41°F to 104°F), 85%RH or less (no condensation) whilst operating the DS analyser.
- Keep flammables away from the analyser.
- Do not put anything on the heater cover.
- The DS analyser should be situated with adequate ventilation or adjust the drying temperature (A&D MF-50 Instruction Manual 2012 – 2020). If the analyser does not have adequate ventilation, the hot air does not diffuse, and the sample may overheat.



Figure 1: Typical dry Solids Analysis Machine (models may vary from site to site)

Sampling Procedure

- Open the lid and place the metal dish onto the scales as shown in Figure 2
- Now turn on the DS machine. The display should show 0.000, if it does not, press the reset button.



Figure 2 DS Machine empty metal dish placement and display

- Place a small portion of the rag material onto the metal dish. Put the material on the dish until the display shows the weight has increased up to the minus sign. This is at the halfway point shown with a red box on the display screen in Figure 3.

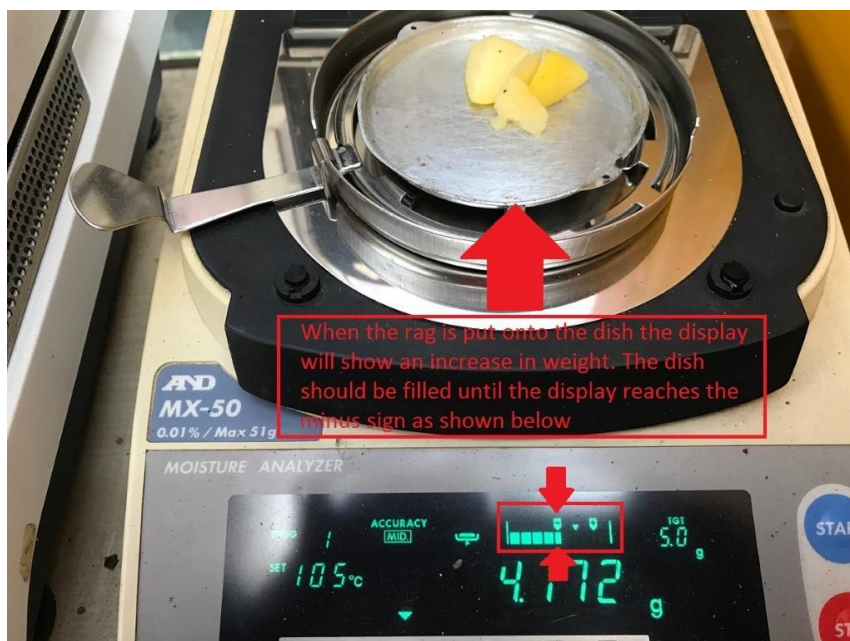


Figure 3. DS Machine – amount of sample required for test

- Once the right amount of rag is placed onto the metal dish, close the lid and press start.
- Leave the machine on until it automatically finishes and take the DS reading off the display screen.
- Record the Dry solid content percentage in the Moisture content spreadsheet located in SharePoint.

References:

A&D MF-50 Instruction Manual 2012 – 2020 <https://www.manualslib.com/manual/236/AAndd-Mf-50.html#manual>

Version Control			
Version	Date	Details	Published By
2.0	3/3/2022	SOP14 Moisture Content Sampling Procedure	O.Boertje & C Bane