Standard Operating Procedure (SOP)

Title	SOP 11 Sewage Sludge Acceptance
Site	Stoke Bardolph, Strongford, Minworth and Finham

Purpose	This document contains the procedure for accepting liquid sludge waste from external (non-Severn Trent Water) customers into the Sewage Sludge Imports disposal route. The purpose of this document is to describe the step-by-step procedure for accepting sewage sludge waste into a permitted Severn Trent sewage treatment works. The procedure ensures environmental quality standards, BAS/sludge is not detrimentally affected by external sludge imports
Who	Tankered Trade Waste Manager, Tankered Process Team, Bio Ops Process Team, Tankered Trade Waste Technicians, Commercial Team, Biosolids Team, Bio Ops Team

Must Have (H&S, Quality, Quantity, Environment, Training, Resources)

If none required then just add 'N/A'

- Standard Operating Procedures (SOP)
- CWID (Commercial Waste Information Database)
- QUIS (For Lab results)
- Waste Acceptance Form (WAF)
- PPE
- EMS training (updated every 3 years)
- Gas monitor and a valid gas monitor training certificate
- STW Interworks logger fob
- Sample of the waste

Remember – 'Stop, Think, Take 20'

Summary Must Do's

If none required then just add 'N/A'

- Review and update the approval process as required.
- Review and complete waste stream pre acceptance measures within a timely manner.
- Review WAF details to ensure they are completed in line with our requirements (e.g. correct EWC, SIC, details on origin of waste).
- Ensure TTWT is available to accept trade waste delivery.
- Ensure waste is approved (booked-in on daily bookings sheet or CWID)
- Ensure all paperwork is completed, and the receipt is uploaded to CWID.
- Do ensure all paperwork is completed, and the receipt is uploaded to CWID. Do not allow a load to discharge if the WTN (waste transfer note) does not have all the necessary fields completed correctly
- Ensure the driver is inducted (if not, carry out site induction), and is competent with discharge points on site. The driver must have a site induction card.
- Review procedure to implement any changes required by the site environmental permit.

Document Control & Governance:			
Document Owner Name	Shayek Ahmed		
Document Owner Role	TTW Process Manager		
Date of Next Review	01/04/2027		
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Waterpedia Reference	*To be entered by Waterpedia Team*		
Version	**Date Reviewed**	**Summary of Changes**	**Reviewed by**
3.0	13/01/22	Updated procedure to include references to testing, approval, and rejection for Sewage sludge.	O. Boertje & C. Bane
4.0	01/04/2025	Checked and added new determinants on table, removed references to accepting Haz waste and changed to Waterpedia format	C Bane
5.0			

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If printed, it is uncontrolled.
Ensure the printed version matches the Revision History details in Waterpedia.
If not, 'DO NOT USE' and contact your line manager for the new version

Standard Operating Procedure (SOP)

Biosolids (sludge) Pre-Acceptance

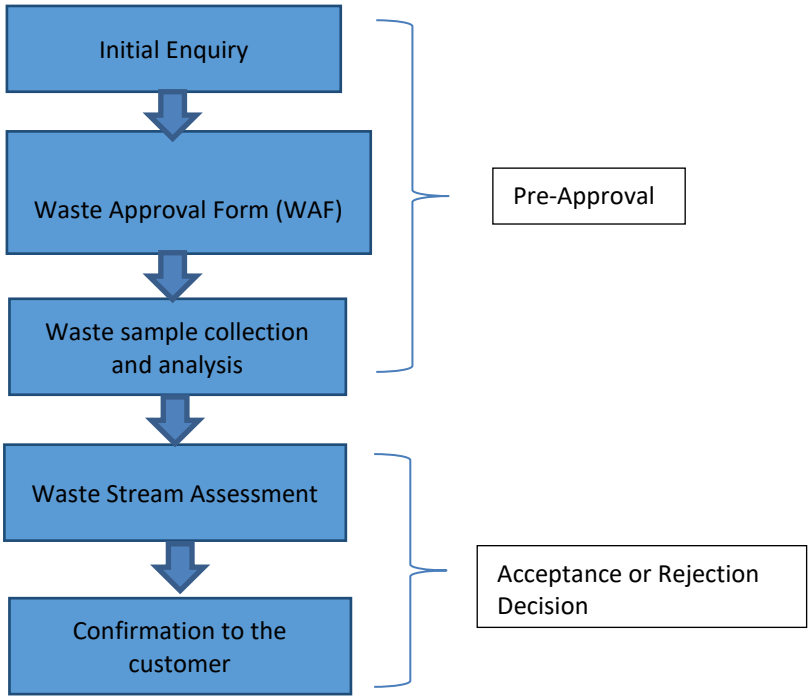

Figure 1. Pre-acceptance flow.

Sewage Sludge Pre-Acceptance:

Initial Enquiry

As outlined in Figure 1, the first step is having the initial enquiry from a customer. The commercial team liaises with the customers and supplies them with a Waste Approval Form (WAF). The customer completes the WAF with the aim of collecting information to support waste characterization.

The information on the WAF must include::

- The name, location, and contact details of the waste producer
- Relevant details of the process giving rise to the waste
- An appropriate description of the waste including its physical form
- The estimated quantity expected to be delivered to the operator per load and in a year
- Information on the nature and variability of the waste production process(es); EWC code (to be checked against requested site's IED (Industrial Emissions Directive) permits and appears suitable for the waste in question – ultimately, the producer is responsible for assignment of the EWC code)
- SIC Code (to be checked is reasonable based on Government/companies house website)
- Process generating the waste
- Nature of the producer business
- Hauler of Waste (if known at time of completion)
- Preferred disposal sites (final approval may be restricted to different sites)
- Approximate yearly tonnage & frequency of delivery
- Other relevant information i.e., COD, Suspended Solids, Ammonia, metal analysis, (sample will be used for this, if not present), List I, List II, and Red List substances if present etc.
- Miscible in water declaration (Must be "Yes", if "No", the waste must be rejected, as it will not be treatable via the inlet route)
- Biodegradable declaration (Must be "Yes", if "No", the waste must be rejected. Waste must be treatable aerobically via activated sludge. "Waste which is not biodegradable shall not be accepted" is stated on all the permits)
- Flash point declaration (Must be >60C, as we currently do not have EX rated discharge equipment/safety apparatus in place for flammable wastes)

As part of the WAF, the waste producer identifies whether the waste contains any hazardous properties prior to approval samples being sent off. There will never be any radioactive waste streams pursued, nor those which may have a risk of containing or being contaminated with radioactive properties.

Waste Sampling

Each waste stream is sent to an external accredited laboratory as part of the waste pre-acceptance procedure. For samples that are less than 3% thickness, they are sent off with the same suite used for other Tankered trade waste (Table 1).

Table 1:List of sampling suites used for regular samples

Description	Units
pH	pH_unit
Suspended Solids [SS]	mg/l
Biological Oxygen Demand [BOD] (2mg/l ATU) 5 day suppressed	mg/l
Ammoniacal Nitrogen [N]	mg/l
Nitrite as [N]	mg/l

Nitrate as [N]	mg/l
Iron [Fe] (total)	mg/l
Aluminium [Al] (total)	mg/l
Cadmium (total) as Cd	mg/l
Cadmium in filtrate as Cd	Mg Cd/l
Chromium (total) as Cr (mg/l)	mg/l
Copper (total) as Cu (mg/l)	mg/l
Lead (Total) as Pb (mg/l)	mg/l
Nickel (total) as Ni (mg/l)	mg/l
Nickel in filtrate as Ni	Mg Ni/l
Zinc (total) as Zn (mg/l)	mg/l
Zinc (total) as Zn (mg/l)	Mg Zn/l
Phenols monohydric (mg/l)	mg/l
Sulphide as S (mg/l)	mg/l
Fluoride as F (mg/l)	mg/l
COD (total)	mg/l
Formaldehyde	Mg/l
Phosphorous total as P	mg/l
Arsenic total as As (mg/l)	mg/l
Mercury Total as Hg	mg/l
Selenium (total) as Se (mg/l)	mg Se/l
Tin (total) as Sn (mg/l)	mg Sn/l
Bromide as Br	mg/l
Cyanide excluding Iron Cyanide (mg/l)	mg/l
Antimony (total) as Sb (mg/l)	mg Sb/l
Molybdenum total mg/l	mg/l
COD 1h settled	mg/l
Sulphate as SO4	mg SO4/l
Chloride	mg Cl/l
AMTOX nitrification inhibition test 25% dilution	%
AMTOX nitrification inhibition test 10%	%
AMTOX nitrification inhibition test 1%	%
AMTOX nitrification inhibition test 0.5%	%
AMTOX nitrification inhibition test 0.1%	%
AMTOX nitrification inhibition test 5%	%
AMTOX nitrification inhibition test 50%	%
Phenols monohydric (mg/l) HPLC	mg/l

Sewage sludge that is thicker than 3% will be sent off using the suite outlined in table 2.

Table 2: For sewage sludge (>3% thickness) and Biosolids (Cake) samples

Description	Units
Mercury [Hg] (total) as Hg dry weight	mg/kg
Arsenic [As] (total) as As dry weight	mg/kg
Selenium [Se] (total) as Se dry weight	mg/kg
pH sludges and soils	pH_unit
Nitrogen as N % Dry weight	% DW
Phosphate as P % Dry weight	% DW
Potassium as K % Dry weight	% DW
Molybdenum (total) as Mo dry weight	mg/kg
Solids Total at 105c	%
Loss on Ignition dried solids	%
Cadmium (total) as Cd dry weight	mg/kg
Chromium (total) as Cr dry weight	mg/kg
Copper (total) as Cu dry weight	mg/kg
Lead (total) as Pb dry weight	mg/kg
Nickel (total) as Ni dry weight	mg/kg
Zinc (total) as Zn dry weight	mg/kg
Sulphur as SO3 % Dry weight	% DW
Sulphur as S % Dry weight	% DW
Magnesium as MgO % Dry weight	% DW
Magnesium as Mg % Dry weight	% DW
Potassium as K2O % Dry weight	% DW
Phosphate as P2O5, % dry weight	% DW
Available Fluoride as F (mg/kg)	mg/kg

Individual waste streams may require additional analysis with consideration of the ecological risk. Furthermore, if the WAF indicates that other contaminates are present these will be investigated with additional analysis undertaken. For example, Siloxane testing is undertaken for wastes with chemical, cosmetic, or pharmaceutical origins. Currently, some waste streams are tested for Biomethane Potential (BMP) by an externally accredited Lab. Assessment of the data is then completed by a competent member of the team. Discharge terms determined accordingly.

Sewage sludge is often a low-risk waste and is therefore sampled on an annual basis unless there is an issue. Then the sampling frequency will increase appropriately. Waste stream risk is outlined in the Tanker Trade Waste pre-acceptance operating procedure (SOP01). As part of BAS compliance there is a particular focus on metal concentrations to ensure that the PTE (potentially toxic elements) match the limits in the biosolids.

All details of the waste enquiry are entered into the CWID database including the Waste Approval Form, A signed seasonal Waste Transfer Note (if one was agreed) and any additional requirements needed.

Waste Transfer Note/Season Ticket

The waste transfer note or a season ticket should include:

- EWC code
- SIC code
- Haulier's carrier registration number
- Name and address of waste producer
- Name and address of disposal site
- The waste hierarchy confirmation must be signed
- Driver name and signature should be present

The technician then fills out the required sections on a WTN and ensures that a copy is captured as part of the waste receipting records. The driver must keep a copy of the season ticket to confirm to the TTWT of the load he has on. The sample jar is labelled with the waste producer, TW ticket number or waste stream reference number, and date received on a small sticker, which is then placed on the sample container lid. A sample will be stored safely as required until disposed off or sent for analysis.

Sewage Sludge Acceptance (Onsite review)

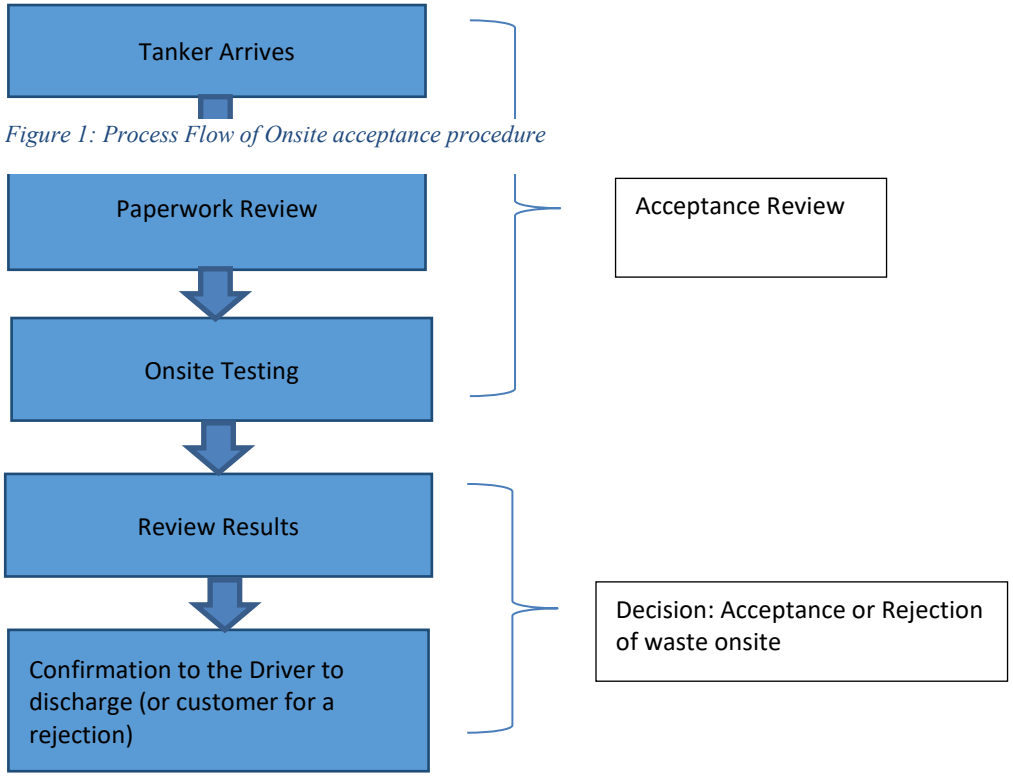

Figure 1: Process Flow of Onsite acceptance procedure

As outlined in Figure 2, the sewage sludge imports are reviewed in line with the standard procedure for waste acceptance (SOP 02) which includes reviewing the results of the approved analysis as per the sampling techniques (SOP 10). An additional assessment will be to review the Dry Solids of the waste via a visual test to determine the sludge disposal route.

Place approximately 200 ml of sludge into a beaker:

- If the sludge dripped in by pipette is runny and blends into the sludge in the beaker as shown in figure 3 the sludge can be discharged into the inlet
- If the sludge forms a layer on the surface as shown in Figure 4, the sludge will be discharged through the sludge route.
- If the sludge shows a similarity to that of Figure 5, (a higher viscosity than other figures) then a judgement will be required to determine if it is around the 8% threshold, which in turn will indicate whether that waste is to be rejected or not.

When time allows (not whilst managing a customer) it is also worth checking you own interpretation of the DS% by comparing the visual analysis against the JRP logger (SOP 04) and Moisture analyser (SOP 14).

Imports of third-party sewage sludge are either discharged via the inlet or the sludge route depending on the dry solid percentage (DS%) of the sludge. Individual sites may have a variance in DS% acceptance, this is reviewed as part of the pre-site and onsite acceptance procedures.

Figure 2: 2% DS sewage sludge is watery

Figure 3: 4% DS sludge looks significantly thicker

Figure 4: 6-8 DS% sewage sludge is thick but still pourable

General Rules:

- Any sewage sludge between 5-8% DS will be discharged into the interworks sludge route.
- Any sewage sludge lower than 4% DS will be discharged into the Interworks inlet.
- Any sewage sludge greater than 8% DS will be rejected

Rejection Procedure:

It may also be rejected if the onsite testing determines there is a discrepancy between the approved analysis and the waste on site. The rejection procedure is described in more detail in TTW Non-Conformance (SOP 03) document.

An outline for sewage sludge rejection procedure is as follows:

1. The customer will be informed that they cannot discharge at our works and will have to leave site for an alternative disposal facility.
2. We will also ask for an investigation as to the reason behind the variation in Dry solids thickness.
3. The rejection will be recorded in our CWID system as part of the waste receipting process.
4. A non-conformance sample will be sent off to the certified lab for analysis.

Where the producer can provide a reasonable explanation for a variance in a waste stream and demonstrate methods or process changes to avoid further occurrences, additional loads may be accepted subject the on-site testing requirements (and possibly additional testing and review). If further variances occur, the waste approval may be removed, and further bookings refused.

Offloading Sewage Sludge

- On the driver's first visit they will be inducted, and then escorted to the discharge point and directed on safe use of connections and loggers (SOP 22).
- Once the waste acceptance procedure has been completed and the waste delivery has been receipted into CWID by the TTWT, the driver will be provided with a JRP pin number
- The driver will use a STW Interworks logger fob for the discharge. This must be returned to the TTWT after use. The fob will give the driver access to the logger. The driver must select their company from the options menu and enter the pin number provided
- Any tanker clear tickets and receipts from non-TW sites will need to be provided to TW techs at least 3 days after month end.

References:

- Technical Guidance WM3: Waste Classification – Guidance on the Classification and assessment of Waste
- BREF for Waste Treatment 2018
- Site Permits
- SOP 02 TTW Waste Acceptance
- SOP 03 TTW Non-conformance
- SOP10 Standard Sampling Tests
- SOP 14 Moisture content sampling procedure
- SOP 17 Biosolids TTW Acceptance & Delivery
- SOP 22 How to use a JRP Logger

Please use the QR code to confirm you have read and understood this SOP

Trade Waste SOPs & LOPs - Read and Understood

Standard Operating Procedure (SOP)