

## Conclusion on BAT for Emissions from Storage

5.1 Storage of liquids and liquidised gases	Applicability Assessment (describe how this technique applies or not to your installation)	State is in place or state schedule for implementation
5.1.1.1 General Principles to prevent and reduce emissions		
<p><b>BAT 1.</b>            BAT for proper design is to take into account at least the following:</p> <ul style="list-style-type: none"> <li>• the physio-chemical properties of the substance being stored</li> <li>• how the storage is operated, what level of instrumentation is needed, how many operators are required, and what their workload will be</li> <li>• how the operators are informed of deviations from normal process conditions (alarms)</li> <li>• how the storage is protected against deviations from normal process conditions (safety instructions, interlock systems, pressure relief devices, leak detection and containment, etc.)</li> <li>• what equipment must be installed, largely taking account of past experiences of the product (construction materials, valve quality, etc.)</li> <li>• which maintenance and inspection plan needs to be implemented and how to ease the maintenance and inspection work (access, layout, etc.)</li> </ul>	<p>The design of the bulk storage areas has considered the requirements of BAT.</p> <p>A site wide EMS is in place for the facility, with staff fully trained and qualified. SOPs are in place for the site running to reduce and management risk of spillages.</p> <p>There is a full containment, and all designed to be suitable for the chemicals stored within designed in accordance with EPA's guidelines for storage and transfer of materials for scheduled activities. SDS for all substance are available on site.</p>	<p>In place</p>

<ul style="list-style-type: none"> <li>how to deal with emergency situations (distances to other tanks, facilities and to the boundary, fire protection, access for emergency services such as the fire brigade, etc.).</li> </ul>	<p>With maintenance or cleaning chemicals/substances in smaller quantities (&gt; 2500L) will be stored in self-bunded storage or areas of continuous hard stand.</p>	
<p><b>BAT 2.</b> BAT is to apply a tool to determine proactive maintenance plans and to develop risk-based inspection plans such as the risk and reliability-based maintenance approach (Section 4.1.2.2.1).</p>	<p>As part of the EMS the site is reviewed for risk prevention, which includes existing EPA guidance on materials storage.</p>	<p>In Place</p>
<p><b>BAT 3.</b> BAT is to locate a tank operating at, or close to, atmospheric pressure aboveground. However, for storing flammable liquids on a site with restricted space, underground tanks can also be considered. For liquefied gases, underground, mounded storage or spheres can be considered, depending on the storage volume.</p>	<p>All Storage are above ground structures operating at or near to atmospheric pressure.  The fuel tanks are be sealed and equipped with breathing vents and over pressure vents for safety purposes. Natural gas is piped underground, provision is available when required and bunded. Emissions to air from the tanks will be minimal.</p>	<p>In Place</p>
<p><b>BAT 4.</b> BAT is to apply either a tank colour with a reflectivity of thermal or light radiation of at least 70 %, or a solar shield on aboveground tanks which contain volatile substances. (Section 4.1.3.6, 4.1.3.7).</p>	<p>Not Applicable.</p>	<p>N/A</p>
<p><b>BAT 5.</b> BAT is to abate emissions from tank storage, transfer and handling that have a significant negative environmental effect. (Section 4.1.3.1).</p>	<p>The bulk fuel tanks will be within bunds designed to the EPA standard of 110% of the volume of the largest drum/tank within the bund or 25% of the total volume of</p>	<p>In Place</p>

	the substance stored. Vapours from tanks are back vented to the biofilter.	
<b>BAT 6.</b> On site where significant VOC emissions are to be expected, BAT includes calculating the VOC emissions regularly.	Undertaken. VOC emissions are monitored regularly by external party (Axis Environment).	In Place
<b>BAT 7.</b> BAT is to apply dedicated systems (Section 4.1.4.4)	Not Applicable	N/A
<b>5.1.1.2 Tank Specific Considerations</b>		
<b>Open Top Tanks</b>		
<b>BAT 8.</b> If emissions to air occur, BAT is to cover the tank by applying: <ul style="list-style-type: none"> <li>• a floating cover (Section 4.1.3.2)</li> <li>• a flexible or tent cover, (Section 4.1.3.3)</li> <li>• or a rigid cover (Section 4.1.3.4)</li> </ul> Additionally, with an open top tank covered with a flexible, tent or a rigid cover, a vapour treatment installation can be applied to achieve an additional emission reduction (Section 4.1.3.15). This type of cover and necessity for applying the vapour treatment system depend on the substances stored and must be decided on a case-by-case basis.	Not Applicable.	N/A
<b>BAT 9.</b>	Not Applicable.	N/A

To prevent deposition that would call for an additional cleaning step, BAT is to mix the stored substance (e.g., slurry) (Section 4.1.5.1.).		
<b>External Floating Roof Tank</b>		
<b>BAT 10.</b> The BAT associated emission reduction level for a large tank is at least 97% (compared to a fixed roof tank without measures), which can be achieved when over at least 95% of the circumference the gap between the roof and the wall is less than 3.2mm and the seals are liquid mounted, mechanical show seals.	Not Applicable.	N/A
<b>BAT 11.</b> BAT is to apply direct contact floating roofs (double-deck); however, existing non-contact roofs (pontoon) are also BAT (Section 3.1.2.) A dome can be BAT for adverse weather conditions, such as high winds, rain, or snowfall (Section 4.1.5.1.).	Not Applicable.	N/A
<b>BAT 12.</b> For liquids containing a high level of particles (e.g., crude oil), BAT is to mix the stored substance to prevent deposition that would call for an additional cleaning step (Section 4.1.5.1.).	Not Applicable.	N/A
<b>Fixed Roof Tanks</b>		
<b>BAT 13.</b> For the storage of volatile substances which are toxic (T), very toxic (T+), or carcinogenic, mutagenic, and reproductive toxic (CMR) categories 1 & 2 in a fixed roof tank, BAT is to apply a vapour treatment installation.	Not Applicable.	N/A
<b>BAT 14.</b>	Undertaken. Tallow tanks are back vented to the biofilter	In Place

For other substances, BAT is to apply a vapour treatment installation, or to install an internal floating roof (Section 4.1.3.15, 4.1.3.10). Direct contact floating roofs and non-contact floating roofs are BAT.		
<b>BAT 15.</b> For tanks <50M <sup>3</sup> , BAT is to apply a pressure relief valve set at the highest possible value consistent with the tank design criteria.	Undertaken	In Place
<b>BAT 16.</b> For liquids containing a high level of particles (e.g., crude oil), BAT is to mix the stored substance to prevent deposition that would call for an additional cleaning step (Section 4.1.5.1.).	Not Applicable.	N/A
<b>Atmospheric horizontal tank</b>		
<b>BAT 17.</b> For the storage of volatile substances which are toxic (T), very toxic (T+), or CMR categories 1 and 2 in an atmospheric horizontal tank, BAT is to apply a vapour treatment installation.	Not Applicable.	N/A
<b>BAT 18.</b> For other substances, BAT is to do all, or a combination, of the following techniques, depending on the substance stored: <ul style="list-style-type: none"> <li>• apply pressure vacuum relief valves (Section 4.1.3.11)</li> <li>• up rate to 56mbar (Section 4.1.3.11)</li> <li>• apply vapor balancing (Section 4.1.3.13)</li> <li>• apply vapor treatment (Section 4.1.3.15)</li> </ul>	Undertaken. Pressure relief valves fitted on pressure vessels.	In Place

The selection of the vapor treatment technology must be decided on a case-by-case basis.		
<b>Pressurised Storage</b>		
<b>BAT 19.</b> BAT for draining depends on the tank type but may be the application of a closed drain system connected to a vapor treatment installation (Section 4.1.4). The selection of the vapor treatment technology must be decided on a case-by-case basis.	Undertaken.	In Place
<b>Litter Roof Tanks</b>		
<b>BAT 20.</b> For emissions to air, BAT is to: <ul style="list-style-type: none"> <li>• apply a flexible diaphragm tank equipped with pressure/vacuum relief valves</li> <li>• or apply a litter rood equipped with pressure/vacuum relief valves and connected to a vapor treatment installation.</li> </ul> The selection of the vapor treatment technology must be decided on a case-by-case basis.	Not Applicable.	N/A
<b>Underground and mounded tanks</b>		
<b>BAT 21.</b> For the storage of volatile substances which are toxic (T), very toxic (T+), or CMR categories 1 and 2 in an underground or mounded tank, BAT is to apply a vapor treatment installation.	Not Applicable.	N/A
<b>BAT 22.</b>	Not Applicable.	N/A

<p>For other substances, BAT is to do all, or a combination, of the following techniques, depending on the substance stored:</p> <ul style="list-style-type: none"> <li>• apply pressure vacuum relief valves (Section 4.1.3.11)</li> <li>• apply vapor balancing (Section 4.1.3.13)</li> <li>• apply a vapor holding tank (4.1.3.14)</li> <li>• apply vapor treatment (4.1.3.15)</li> </ul> <p>The selection of the vapor treatment technology must be decided on a case-by-case basis.</p>		
<b>5.1.1.3 Preventing incidents and (major) accidents</b>		
<p><b>BAT 23.</b></p> <p>BAT in preventing incidents and accidents is to apply a safety management system (Section 4.1.6.1.1).</p>	Undertaken.	In Place
<p><b>BAT 24.</b></p> <p>BAT is to implement and follow adequate organisational measures and to enable training and instruction of employees for safe and responsible operation of the installation (Section 4.1.6.1.1).</p>	Undertaken.	In Place
<p><b>BAT 25.</b></p> <p>Bat is to prevent corrosion by:</p> <ul style="list-style-type: none"> <li>• selection construction material that is resistant to the product stored</li> <li>• applying proper construction methods</li> </ul>	Undertaken.	In place

<ul style="list-style-type: none"> <li>• preventing rainwater or groundwater entering the tank if necessary, removing water that has accumulated in the tank</li> <li>• applying rainwater management to bund damage</li> <li>• applying preventive maintenance</li> <li>• where applicable, adding corrosion inhibitors, or applying cathodic protection on the inside of the tank.</li> </ul>		
<p><b>BAT 26.</b></p> <p>Additionally for an underground tank, BAT is to apply to the outside of the tank:</p> <ul style="list-style-type: none"> <li>• a corrosive-resistant coating</li> <li>• plating and/or</li> <li>• a cathodic protection system.</li> </ul>	<p>Undertaken. No underground tanks. One underground sump which is reinforced concrete.</p>	<p>In Place</p>
<p><b>BAT 27.</b></p> <p>BAT is to prevent stress corrosion cracking (SCC) by:</p> <ul style="list-style-type: none"> <li>• stress relieving by post-weld heat treatment (Section 4.1.6.1.4)</li> <li>• applying a risk-based inspection (Section 4.1.2.2.1).</li> </ul>	<p>Undertaken. Tank welds are not certified. Tanks are integrity inspected every 3 years by an engineer.</p>	<p>In Place</p>
<p><b>BAT 28.</b></p> <p>BAT is to implement and maintain operational procedures – e.g., by means of a management system, to ensure that:</p> <ul style="list-style-type: none"> <li>• high level or high-pressure instrumentation with alarm settings and/or auto closing of valves is installed</li> </ul>	<p>Undertaken.</p>	<p>In place</p>



<ul style="list-style-type: none"> <li>proper operating instructions are applied to prevent overflow during a tank filling operation</li> <li>sufficient ullage is available to receive a batch filling (Section 4.1.6.1.5).</li> </ul>		
<p><b>BAT 29.</b> BAT is to apply leak detection on storage tanks containing liquids that can potentially cause soil pollution.</p>	Undertaken.	In place
<p><b>BAT 30.</b> Bat is to achieve a ‘negligible risk level’ of soil pollution from bottom and bottom-wall connections of aboveground storage tanks. However, on a case-by-case basis, situations might be identified where an ‘acceptable risk level’ is sufficient.</p>	Undertaken.	In place
<p><b>BAT 31.</b> BAT for aboveground tanks containing flammable liquids or liquids that pose a risk for significant soil pollution or a significant pollution of adjacent watercourses is to provide secondary containment:</p> <ul style="list-style-type: none"> <li>tank bunds around single wall tanks (Section 4.1.6.1.11)</li> <li>double wall tanks (Section 4.1.6.1.13)</li> <li>cup-tanks (Section 4.1.6.1.14)</li> <li>double wall tanks with monitored bottom discharge (4.1.6.1.15).</li> </ul>	Undertaken.	In place
<p><b>BAT 32.</b> For buildings new single walled tanks containing liquids that pose a risk for significant soil pollution or a significant pollution of adjacent watercourses, BAT is to apply a full, impervious, barrier in the bund (Section 4.1.6.1.10).</p>	Undertaken	In Place

<p><b>BAT 33.</b></p> <p>For existing tanks within a bund, BAT is to apply a risk-based approach, considering the significance of risk from product spillage to the soil, to determine if and which barrier is best applicable. This risk-based approach can also be applied to determine if a partial impervious barrier in a tank bund is sufficient or if the whole bund needs to be equipped with an impervious barrier (Section 4.1.6.1.12).</p>	Undertaken.	In place
<p><b>BAT 34.</b></p> <p>For chlorinated hydrocarbon (CHC) in single walled tanks. AT is to apply CHC-proof laminates to concrete barriers (and containments), based on phenolic or furan resins. One form of epoxy resin is also CHC-proof (Section 4.1.6.1.22).</p>	Not Applicable.	N/A
<p><b>BAT 35.</b></p> <p>BAT for underground and mounded tanks containing products that can potentially cause soil pollution to:</p> <ul style="list-style-type: none"> <li>• apply a double walled tank with leak detection</li> <li>• to apply a single walled tank with secondary containment and leak detection.</li> </ul>	Not Applicable.	N/A
<p><b>BAT 36.</b></p> <p>For toxic, carcinogenic or other hazardous substance, BAT is to apply full containment.</p>	Not Applicable.	N/A
<p><b>5.1.2 Storage of packaged dangerous substances</b></p>		
<p><b>BAT 37.</b></p> <p>BAT in preventing incidents and accidents is to apply safety management system (Section 4.1.6.1). The minimum level of BAT is to assess the risks of accidents and incidents on the site using the five steps (Section 4.1.6.1).</p>	Undertaken.	In place

<p><b>BAT 38.</b></p> <p>BAT is to appoint a person or persons who is or are responsible for the operation of the store.</p>	<p>Undertaken.</p>	<p>In place</p>
<p><b>BAT 39.</b></p> <p>BAT is to provide the responsible person(s) with specific training and retraining in emergency procedures and to inform other staff on the site of the risks of storing packaged dangerous substances and the precautions necessary to safely store substances that have different hazards.</p>	<p>Undertaken.</p>	<p>In Place</p>
<p><b>BAT 40.</b></p> <p>BAT is to apply a storage building and/or an outdoor storage area covered with a roof. For storing quantities of less than 2,500 litres or kilograms dangerous substances, applying a storage cell (Section 4.1.7.2).</p>	<p>Not Applicable.</p>	<p>N/A</p>
<p><b>BAT 41.</b></p> <p>BAT is to separate the storage area or building of packaged dangerous substances from other storage, from ignition sources and from other buildings on and off-site by applying a sufficient distance, sometimes in combination with fire-resistant walls.</p>	<p>Undertaken.</p>	<p>In Place</p>
<p><b>BAT 42.</b></p> <p>BAT is to separate and/or segregate incompatible substances. For the compatible and incompatible combinations (Annex 8.3).</p>	<p>Incompatible substances are kept separated for storage in bunds</p>	<p>In Place</p>
<p><b>BAT 43.</b></p> <p>BAT is to install a liquid-tight extinguishant collecting provision in storage and storage buildings on site.</p>	<p>Not Applicable.</p>	<p>N/A</p>

<p><b>BAT 44.</b></p> <p>BAT is to install a liquid-tight extinguishant collecting provision in storage buildings and storage areas. The collecting capacity depends on the substances stored, the amount of substance stored, the type of package used and the applied fire-fighting system and can only be decided on a case-by-case basis.</p>	<p>Not Applicable.</p>	<p>N/A</p>
<p><b>BAT 45.</b></p> <p>BAT is to apply a suitable protection level of fire prevention and fire-fighting measures. The appropriate protection level must be decided on a case-by-case basis in agreement with the local fire brigade (Section 4.1.7.6).</p>	<p>Undertaken.</p>	<p>In place</p>
<p><b>BAT 46.</b></p> <p>Bat is to prevent ignition at source (Section 4.1.7.6.1).</p>	<p>Undertaken. Ignition is prevented at source.</p>	<p>In Place</p>
<p><b>5.1.3 Basins and lagoons</b></p>		
<p><b>BAT 47.</b></p> <p>Where emissions to air from normal operation are significant, e.g., with the storage of pig slurry, BAT is to cover basins and lagoons using one of the following options:</p> <ul style="list-style-type: none"> <li>• a plastic cover (Section 4.1.8.2)</li> <li>• a floating cover (Section 4.1.8.1)</li> <li>• only small basins, a rigid cover (Section 4.1.8.2)</li> </ul> <p>Additionally, where a rigid cover is used, a vapor treatment installation can be applied to achieve an extra emission reduction. The need for and type of vapor treatment must be decided on a case-by-case basis.</p>	<p>Not Applicable.</p>	<p>N/A</p>

<p><b>BAT 48.</b></p> <p>To prevent overflowing due to rainfall in situations where the basin or lagoon is not covered, BAT is to apply a sufficient freeboard (Section 4.1.11.1).</p>	<p>Not Applicable.</p>	<p>N/A</p>
<p><b>BAT 49.</b></p> <p>Where substances are stored in a basin or lagoon with a risk of soil contamination BAT is to apply an impervious barrier. This can be flexible membrane, a sufficient clay later or concrete (Section 4.1.9.1).</p>	<p>Not Applicable.</p>	<p>N/A</p>
<p><b>5.2 Transfer and handling of liquids and liquefied gases</b></p>		
<p><b>5.2.1 General principles to prevent and reduce emissions</b></p>		
<p><b>BAT 50.</b></p> <p>BAT is to apply a tool to determine proactive maintenance plans and to develop risk-based inspection plans such as, the risk and reliability-based maintenance approach (Section 4.1.2.2.1).</p>	<p>Undertaken. Maintenance jobs are planned and record through maintenance management.</p>	<p>In Place</p>
<p><b>BAT 51.</b></p> <p>For large storage facilities, according to the properties of the product stored, BAT is to apply a leak detection and repair programme. Focus needs to be on those situations most likely to cause emissions (such as gas/light liquid, under high pressure and/or temperature duties) (Section 4.2.1.3).</p>	<p>Not Applicable.</p>	<p>N/A</p>
<p><b>BAT 52.</b></p> <p>BAT is to abate emissions from tank storage, transfer and handling that have a significant negative environmental effect (Section 4.1.3.1).</p>	<p>Undertaken. Vapour emissions are sent to the biofilter for treatment, whereas emissions from tank storage are sent to the WWTP for treatment.</p>	<p>In Place</p>

<p><b>BAT 53.</b> BAT in preventing incidents and accidents is to apply a safety management system (Section 4.1.6.1).</p>	<p>A Safety management system is in place</p>	<p>In Place</p>
<p><b>BAT 54.</b> BAT is to implement and follow adequate organisational measures and to enable the training and instruction of employees for safe and responsible operation of the installation (Section 4.1.6.1.1).</p>	<p>Employees are given training and instructions on how to operate all machines and equipment responsibly and safely on site.</p>	<p>In Place</p>
<p><b>5.2.2 Considerations on transfer and handling techniques</b></p>		
<p><b>5.2.2.1 Piping</b></p>		
<p><b>BAT 55.</b> BAT is to apply aboveground closed piping in new situation (Section 4.2.4.1) For existing underground piping it is BAT to apply a risk and reliability-based maintenance approach (Section 4.1.2.2.1).</p>	<p>Undertaken.</p>	<p>In place</p>
<p><b>BAT 56.</b> BAT is to minimise the number of flanges by replacing them with welded connections, within the limitation of operational requirements for equipment maintenance or transfer system flexibility (Section 4.2.2.1).</p>	<p>Undertaken. Where there is no need for equipment maintenance, welded connections are installed.</p>	<p>In Place</p>
<p><b>BAT 57.</b> BAT for bolted flange connections include:</p> <ul style="list-style-type: none"> <li>• fitting blind flanges to infrequently used fitting to prevent accidental opening</li> <li>• using end caps or plugs on open-ended lines and not valves</li> </ul>	<p>Undertaken.</p>	<p>In place</p>

<ul style="list-style-type: none"> <li>ensuring gaskets are selected appropriate and loaded correctly</li> <li>where toxic, carcinogenic or other hazardous substance are transferred, fitting high integrity gaskets, such as spiral wound, kammprofile or ring joints.</li> </ul>		
<p><b>BAT 58.</b></p> <p>BAT is to prevent corrosion by:</p> <ul style="list-style-type: none"> <li>Selecting constriction materials that is resistant to the product</li> <li>Applying proper construction methods</li> <li>Applying preventive maintenance</li> <li>Where applicable, applying an internal coating or adding corrosion inhibitors</li> </ul>	Undertaken.	In place
<p><b>BAT 59.</b></p> <p>To prevent the piping from external corrosion, BAT is to apply a one, two, or three-layer coating system depending on the site-specific conditions (e.g., close to sea). Coating is normally not applied to plastic or stainless-steel pipelines (Section 4.2.3.2).</p>	Undertaken. Only plastic and stainless-steel pipes are used onsite.	In Place
<p><b>5.2.2.2 Vapor Treatment</b></p>		
<p><b>BAT 60.</b></p> <p>BAT is to apply vapor balancing or treatment on significant emissions from the loading and unloading of volatile substances to (or from) trucks, barges, and ships. The significance of the emission depends on the substance and the volume that is emitted and must be decided on a case-by-case basis (Section 4.2.8).</p>	All raw materials and finished products are loaded under negative pressure and with vapours that are directed toward biofilters in a restricted space.	In Place

<b>5.2.2.3 Valves</b>		
<p><b>BAT 61.</b></p> <p>Bat for valves include:</p> <ul style="list-style-type: none"> <li>• correct selection of the packing material and construction for the process application</li> <li>• with monitoring, focus on those valves most at risk (such as rising stem control valves in continual operation)</li> <li>• applying rotating control valves or variable speed pumps instead of rising stem control valves</li> <li>• where toxic, carcinogenic or other hazardous substances are involved, fit diaphragm, bellows, or double walled valves</li> <li>• route relief valves back into the transfer or storage system or to a vapour treatment system</li> </ul>	Undertaken.	In place
<b>5.2.2.4 Pumps and compressors</b>		
<p><b>BAT 62.</b></p> <p>The following are some of the main factors which constitute BAT:</p> <ul style="list-style-type: none"> <li>• proper fixing of the pump or compressor unit to its baseplate or frame</li> <li>• having connecting pipe forces within producers' recommendations</li> <li>• proper design of suction pipework to minimise hydraulic imbalance</li> <li>• alignment of shaft and casing within producers' recommendations</li> </ul>	All Undertaken.	In place



<ul style="list-style-type: none"> <li>• alignment of driver/pump or compressor coupling within producers' recommendations when fitted</li> <li>• correct level of balance of rotating parts</li> <li>• effective priming of pumps and compressors prior to star-up</li> <li>• operation of the pump and compressor within producers' recommendations when fitted.</li> <li>• correct level of balance of rotating parts</li> <li>• effective priming of pumps and compressors prior to start-up</li> <li>• operation of the pump and compressor within producers' recommended performance range (The optimum performance is achieved at its best efficiency point.)</li> <li>• the level of net positive suction head available should always be more than the pump or compressor</li> <li>• regular monitoring and maintenance of both rotating equipment and seal systems, combined with a repair or replacement programme.</li> </ul>		
<p><b>BAT 63.</b>  BAT is to use the correct selection of pump and seal types for the process application, preferably pumps that are technologically designed to be tight such as canned motor pumps, magnetically coupled pumps, pumps with multiple mechanical seals and a quench or buffer system, pumps with multiple mechanical seals and seals dry to the atmosphere, diaphragm pumps or bellows pumps (Section 3.2.2.2, 3.2.4.1, 4.2.9).</p>	All Undertaken.	In Place

<b>BAT 64.</b> BAT for compressors transferring non-toxic is to apply gas lubricated mechanical seals.	Not Applicable.	N/A
<b>BAT 65.</b> BAT for compressors, transferring toxic gases is to apply double seals with a liquid or gas barriers and to purge the process side of the containment seal with an inert buffer gas.	Not Applicable.	N/A
<b>BAT 66.</b> In very high-pressure services, BAT is to apply a triple tandem seal system.	Not Applicable.	N/A
<b>5.2.2.5 Sampling Connections</b>		
<b>BAT 67.</b> BAT for sample points for volatile products, is to apply a ram type sampling valve or a needle valve and a block valve. Where sampling lines require purging, BAT is to apply closed-loop sampling line (Section 4.2.9.14).	Not Applicable	N/A
<b>5.3 Storage of Solids</b>		
<b>5.3.1 Open Storage</b>		
<b>BAT 68.</b> BAT is to apply enclosed storage by using, for example, silos, bunkers, hoppers, and containers, to eliminate the influence of wind and to prevent the formation of dust by wind as far as possible by primary measures. (Table 4.12 for primary measures).	Undertaken	In Place
<b>Bat 69.</b> BAT for open storage is to carry out regular or continuous visual inspections to see if dust emissions occur and to check if preventive measures are in good working order.	Undertaken.	In Place

<p>Following the weather forecast by e.g., using meteorological instruments on site, will help to identify when the moistening of heaps is necessary and will prevent unnecessary use of resources for moistening the open storage (Section 4.3.3.1).</p>		
<p><b>BAT 70.</b>  BAT for long-term open storage is one, or a proper combination, of the following techniques:</p> <ul style="list-style-type: none"> <li>• moistening the surface using durable dust-binding substances (Section 4.3.6.1)</li> <li>• covering the surface, e.g., with tarpaulins (Section 4.3.4.4)</li> <li>• solidification of the surface</li> <li>• grassing-over of the surface (Table 4.13).</li> </ul>	<p>Not Applicable</p>	<p>N/A</p>
<p><b>BAT 71.</b>  BAT for short-term open storage is one, or a proper combination, of the following techniques:</p> <ul style="list-style-type: none"> <li>• moistening the surface using durable dust-binding substances (Section 4.3.6.1)</li> <li>• moistening the surface with water (Section 4.3.6.1)</li> <li>• covering the surface, e.g., with tarpaulins (Section 4.3.4.4).</li> </ul>	<p>Undertaken. If anything is kept outside, it is in tarpaulin-covered containers.</p>	<p>In Place</p>
<p><b>5.3.2 Enclosed Storage</b></p>		
<p><b>BAT 72.</b>  BAT is to apply enclosed storage for example, silos, bunkers, hoppers, and containers. Where silos are not applicable, storage in sheds can be an alternative. This is, e.g., the case if apart from storage, the mixing of batches is needed.</p>	<p>Undertaken. Before processing, raw materials are kept in hoppers. Before use, meat and bone meal is kept in a silo.</p>	<p>In Place</p>

<p><b>BAT 73.</b> BAT for silos is to apply a proper design to provide stability and prevent the silo from collapsing (Section 4.3.4.1, 4.3.4.5).</p>	<p>Undertaken. Relief systems are installed on.</p>	<p>In Place</p>
<p><b>BAT 74.</b> BAT for shed is to apply proper designed ventilation and filtering systems and to keep the doors closed (Section 4.3.4.2)</p>	<p>Undertaken</p>	<p>In Place</p>
<p><b>BAT 75.</b> BAT is to apply dust abatement and a BAT associated emission level of 1 – 10 mg/m<sup>3</sup>, depending on the nature/type of substance stored. The type of abatement technique must be decided on a case-by-case basis (Section 4.3.7).</p>	<p>Not Applicable</p>	<p>N/A</p>
<p><b>BAT 76.</b> For a silo containing organic solids, Bat is to apply an explosion resistant silo, equipped with a relief valve that closes rapidly after the explosion to prevent oxygen entering the silo (Section 4.3.8.3, 4.3.8.4)</p>	<p>Undertaken. Relief valve in place on silos</p>	<p>In Place</p>
<p><b>5.3.4 Preventing incidents and (major) accidents</b></p>		
<p><b>BAT 77.</b> BAT in preventing incidents and accidents in applying a safety management system (Section 4.1.7.1)</p>	<p>Undertaken.</p>	<p>In Place</p>

<b>5.4 Transfer and Handling of Solids</b>		
<b>5.4.1 General approaches to minimise dust from transfer and handling</b>		
<p><b>BAT 78.</b></p> <p>BAT is to prevent dust dispersion due to loading and unloading activities in the open air, by scheduling the transfer as much as possible when the wind speed is low. However, and taking into account the local situation, this type of measure cannot be generalised to the whole EU and to any situation irrespective of the possible high costs (Section 4.4.3.1)</p>	Undertaken. All raw materials, meat and bone meal are transferred in enclosed areas with minimal wind speed to reduce dust dispersal.	In Place
<p><b>BAT 79.</b></p> <p>When applying a mechanical shovel, BAT is to reduce the drop height and to choose the best position during discharging into a truck (Section 4.4.3.4).</p>	Undertaken. All employees are trained to follow best practise when using a mechanical shovel.	In Place
<p><b>BAT 80.</b></p> <p>BAT then is to adjust the speed of vehicles on-site to avoid or minimise dust being swirled up (Section 4.4.3.5.2)</p>	Undertaken. All vehicles are cleaned when required at on-site location.	In Place
<p><b>BAT 81.</b></p> <p>BAT for roads that are used by trucks and cars only, is applying hard surfaces to the road of, for example, concrete or asphalt, because these can be cleaned easily to avoid dust being swirled up by vehicles. However, applying hard surfaces to the roads is not justified when the roads are used just for bucket shovel vehicles or when a road is temporary (Section 4.4.3.5.3)</p>	Undertaken. All roads are hard surfaces and maintained.	In Place
<p><b>BAT 82.</b></p> <p>BAT is to clean roads that are fitted with hard surfaces (4.4.6.12)</p>	Undertaken. All roads on-site are dry and wet cleaned.	In Place

<p><b>BAT 83.</b></p> <p>Cleaning of vehicle tyres is BAT. The frequency of cleaning and type of cleaning facility applied must be decided on a case-by-case basis (Section 4.4.6.13)</p>	<p>Undertaken. All vehicles are cleaned at the on-site wash when required.</p>	<p>In Place</p>
<p><b>BAT 84.</b></p> <p>Where it neither compromises product quality, plant safety, nor water resources, BAT for loading/unloading drift sensitive, wettable products is to moisten the product. Risk of freezing of the product, risk of slippery situations because of ice forming or wet product on the road and shortage of water are examples when this BAT might not be applicable (Section 4.4.6.8, 4.4.6.9, 4.3.6.1).</p>	<p>Not Applicable</p>	<p>N/A</p>
<p><b>BAT 85.</b></p> <p>For loading/unloading activities, BAT is to minimise the speed of descent and the free fall height of the product. Minimising the speed of descent can be achieved by the following techniques that are BAT:</p> <ul style="list-style-type: none"> <li>• installing baffles inside fill pipes</li> <li>• applying a loading head at the end of the pip or tube to regulate the output speed</li> <li>• applying a cascade (e.g., cascade tube or hopper)</li> <li>• applying a minimum slope angle (e.g., chutes). (Section 4.4.5.6, 4.4.5.7)</li> </ul>	<p>Undertaken.</p>	<p>In Place</p>
<p><b>BAT 86.</b></p> <p>To minimise the free fall height of the product, the outlet of the discharge should reach down onto the bottom of the cargo space or onto the material already piled up. Loading techniques that can achieve this, and that are BAT, are:</p>	<p>Undertaken. Fill pipes are adjustable</p>	<p>In Place</p>

<ul style="list-style-type: none"> <li>• height adjustable fill paper</li> <li>• height adjustable fill tubes, and</li> <li>• height adjustable cascade tubes.</li> </ul> <p>These techniques are BAT, expect when loading/unloading non drift sensitive products, for which the free fall height is not that critical.</p>		
<b>5.4.2 Considerations on Transfer Techniques</b>		
<p><b>BAT 87.</b></p> <p>For applying a grab, BAT is to follow the decision diagram and to leave the grab in the hopper for a sufficient time after the material discharge (Section 4.4.3.2).</p>	Not Applicable	N/A
<p><b>BAT 88.</b></p> <p>BAT for new grabs, is to apply grabs with the following properties:</p> <ul style="list-style-type: none"> <li>• geometric shape and optimal load capacity</li> <li>• the grab volume is always higher than the volume that is given by the grab curve</li> <li>• the surface is smooth to avoid material adhering, and</li> <li>• a good closure capacity during permanent operation (Section 4.4.5.1).</li> </ul>	Not Applicable	N/A
<p><b>BAT 89.</b></p> <p>For all types of substances, BAT is to design conveyor transfer chutes in such a way that spillage a way that silage is reduced to a minimum. A modelling process is available to generate detail designs for new and existing transfer points.</p>	Undertaken. Transfer shuts are fully sealed on conveyors	In Place.

<p><b>BAT 90.</b></p> <p>For non or very slightly drift sensitive products (S5) and moderately drift sensitive, wettable products (S4), BAT is to apply an open belt conveyor and additionally, depending on the local circumstances, one or a proper combination of the following techniques:</p> <ul style="list-style-type: none"> <li>• lateral wind protection (Section 4.4.6.1)</li> <li>• spraying water and jet spraying at the transfer points (section 4.4.6.8, 4.4.6.9)</li> <li>• belt cleaning (4.4.6.10)</li> </ul>	<p>Not Applicable</p>	<p>N/A</p>
<p><b>BAT 91.</b></p> <p>For highly drift sensitive products (S1 and S2) and moderately drift sensitive, not wettable products (S3) BAT for new situations, is to:</p> <p>Apply closed conveyors, or types where the belt itself or a second belt locks the material (Section 4.4.5.2)</p> <ul style="list-style-type: none"> <li>• pneumatic conveyors</li> <li>• trough chain conveyors</li> <li>• screw conveyors</li> <li>• tube belt conveyor</li> <li>• loop belt conveyor</li> <li>• double belt conveyor or to apply enclosed conveyor belts support pulleys (Section 4.4.5.3) such as:</li> <li>• aero belt conveyor</li> <li>• low friction conveyor</li> </ul>	<p>Undertaken. All meal is loaded inside facilities with the use of a closed conveyor used to transport it.</p>	<p>In Place</p>



<ul style="list-style-type: none"> <li>conveyor with diabolos.</li> </ul> <p>The type of conveyor depends on the substance to be transported and on the location and must be decided on a case-by-case basis.</p>		
<p><b>BAT 92.</b></p> <p>For existing conventional conveyors, transporting highly drift sensitive products (S1 and S2) and moderately drift sensitive, not wettable products (S3), BAT is to apply housing. When applying an extraction system, BAT is to filter the outgoing air stream (Section 4.4.6.2, 4.4.6.4).</p>	Not Applicable	N/A
<p><b>BAT 93.</b></p> <p>To reduce energy consumption for conveyor belts, BAT is to apply:</p> <ul style="list-style-type: none"> <li>a good conveyor design, including idlers and idlers spacing</li> <li>an accurate installation tolerance</li> <li>a belt with low rolling resistance</li> </ul>	Undertaken. No belts on site. All augers	In Place