Water Environment Association of Texas

TEXAS ASSOCIATION OF CLEAR WATER AGENCIES
TACWA
A CLEAR COMMITMENT TO TEXAS WATERS

1825 Fort View Road, Suite 108, Austin, Texas 78704 | 512.693.0060 | www.weat.org

Mr. David W. Galindo
Director
Water Quality Division
Texas Commission on Environmental Quality
12100 Park 35 Circle
Austin, Texas 78753

Re: Feedback related to the plastics presentation which is available on our website at https://www.tceq.texas.gov/waterquality/standards/WQ_stds.

Dear Mr. Galindo,

The Water Environment Association of Texas (WEAT), Texas Association of Clean Water Agencies (TACWA) are organizations of environmental professionals, practitioners, operations specialists, and public officials in the water and wastewater industry working together to benefit society through protection and enhancement of the water environment. As part of WEAT and TACWA's mission a WEAT/TACWA Stormwater/Watershed Protection Committee was formed.

Stormwater/Watershed Protection Committee consists of watershed protection department municipal employees and consultants specializing in stormwater and watershed issues. The members of the Stormwater/Watershed Protection Committee have extensive domain experience and appreciate the opportunity to provide the following feedback regarding plastics discharged to Surface Water in the State.

The TCEQ requests your input on the following topics related to the plastics presentation which is available on our website at https://www.tceq.texas.gov/waterquality/standards/WQ_stds.

1. *Please provide input on the following proposed definition of plastic (taking into consideration the focus on pre-production plastic): Plastic means all forms of visible plastic produced, received, or handled at the permittee's facility, including but not limited to: pellets, powder and flakes.*

   The TCEQ's proposed definition of "plastic"

   (1) The proposed definition of plastic contains the defined word "plastic" within it. It would be more appropriate for the definition to include the fact that plastics are synthetic materials consisting of organic polymers and additives. Alternatively, because the name "plastic" captures its properties of deforming without breaking, the current TCEQ slide could be revised to include a stand-alone definition, followed by the example (which appears to be intended to highlight that TCEQ would regulate *visible* plastics).

   (2) The proposed definition fails to clearly identify the materials that it seeks to regulate. In the common and scientific vernaculars, "plastic" refers to a large, ill-defined, and growing list of materials. We recommend using a definition for "plastic" that explicitly

describes the composition of the materials and lists the specific polymer compounds (polypropylene, polyvinyl chloride, etc.) to be regulated.

(3) Details related to 1) the processes that the material is involved in at the permittee's facility and 2) the shape and size of the material should be secondary to the material composition. However, plastic may be classified by size or by origin if that facilitates and clarify regulatory language, as necessary and as described below.

2. *TCEQ's intent is to regulate plastics visible to the naked eye, but please provide input on class sizes for review. Additionally, please provide input on the use of the word "visible" in the definition above.*

(1) Plastic Size

Plastics and pre-production plastics come in various shapes and sizes. Additionally, large plastics can fragment and degrade through normal use and weathering to form smaller plastics. Both large and small plastics pose significant hazards to humans and the natural environment and should be regulated. For example, while large pieces of plastic pollution can be easier to clean up than small pieces of plastic pollution, many small pieces of plastic pollution can form from a single large piece of plastic pollution. Compared to large pieces of plastic, small pieces of plastic pollution are more easily ingested by animals and humans as well as absorbed by plants. The smaller pieces of plastic or fragments are difficult to remove from waters.

In terms of sizes, plastics have generally been classified as macroplastics, microplastics and nanoplastics (WHO, 2019). Macroplastics are larger than 5 mm[1]. Microplastics are those plastics with sizes between 5 mm and either 1 or 0.1 µm. Nanoplastics are plastics smaller than 1 or 0.1 µm. The smaller particles are much less visible to the naked eye and require even finer mesh or filter pore sizes to effectively capture.

It may be more beneficial to define plastics instead by origin, as either primary (a manufactured product in a specific size range) or secondary (derived from degradation of larger particles). Bulk materials spilled into the environment typically result from primary plastics and may range in size from larger visible particles (macroplastics), microplastics, and down to nanoplastics. Plastic pellets, for example, are typically produced in diameters of a few millimeters (typically 4.5 mm diameter and 5 mm length), and some of the plastic powders size used in the production of pellets range in the order of 500 µm.

When it comes to ingestion of plastics by small predators, it has been shown that size of the particles matters more than the shape of the particles (Lehtiniemi, et al, 2018).

(2) WEAT's view on the use of "visible" characteristic as regulation threshold for plastics.

Regarding the proposed standard, there are at least four compelling reasons why the TCEQ should not discriminate between plastics that are visible or invisible to the naked

[1] The 5 mm is somewhat arbitrary.

eye, nor should it set effluent standards based on it. Instead, for the reasons described below, a quantifiable threshold standard may lead to more regulatory certainty and leave less room for case-by-case interpretation:

(a) visual acuity differs from person to person, and thus, eyesight is not a standardized analytical instrument.

(b) the visibility of a plastic in a stormwater or waste stream depends on many factors. For example, what is "visible" at low flow rates may not be "visible" at high flow rates. Furthermore, plastic powder may be "visible" as an agglomerate but become "invisible" when the powder is dispersed by stirring or agitating the solution.

(c) plastics that may not qualify as "visible" may be at least equally detrimental to the environment, supporting a more established standard that isn't reduced to an eyesight rubric.

(d) the same material that may be visible under controlled conditions (e.g. grabbing a sample of water in a vial and observing it with the naked eye), while completely invisible once released to the environment.

To further support WEAT's opinion on the inadequacy of using the word "visible", we can quote some of the remarks found in the Scientific Perspective on Microplastics in Nature prepared by the Science Advice for Policy by European Academies (SAPEA) consortium: "The main aspect in which micro- and nano- plastics contrast with larger plastic debris in general, is the fact that they are virtually invisible once dispersed in the environment", (SAPEA, 2019).

(3) WEAT's view on plastics quantification and/or development of water quality standards and/or discharge limitations.

Based on its physical characteristics, plastics can be isolated from its water matrix by filtration. Therefore, its mass can be quantified for a given sample. Plastic powders used to manufacture plastic pellets (typically in sizes in the order of 500 μm) is detectable in a completely mixed flow reactor by means of turbidity measurement. Turbidity measurement is simple, of low cost and a rapid test. However, in terms of plastic powders, due to the physical properties of different polymers, turbidity shows different inconsistent correlations between particle concentration and resulting turbidity signal. Therefore, turbidity, as a measure of plastic powders, should only be utilized as a general indicator of water quality and for general monitoring purposes to determine process efficiency, but should not be utilized to determine plastic powder concentration.

As is the common practice for many other pollutants, plastic pollution should be quantified on the basis of concentration (mass per volume) and loading (mass per unit of time) and regulated similarly. One approach to do so is as follows. First, the TCEQ designates a standard mesh size for plastic pollution quantification (mesh size should be

smaller than the smallest plastic particle that will be regulated). The highest mesh size (smallest opening size) feasible should be used. Second, operators, monitors, or regulators position the mesh perpendicular to the flow of the waste or stormwater stream. After a determined period of time, the plastic debris rejected by the mesh is captured, dried, and weighed. Finally, if the flow rate of the waste stream is known, the mass of plastic pollution per volume of waste solution can be calculated. Inevitably, plastic pollution that is small enough to pass through the mesh will not be accounted for in this calculation. However, this approach, or a similar approach, will provide a precise method to quantify plastic pollution in a waste or stormwater stream. In addition, this approach will not discriminate between plastics of different densities *or shapes.*

3. *In addition to the prohibition, permittees with stormwater outfalls under the Multi-Sector General Permit or an individual permit will be required to develop a comprehensive set of Best Management Practices (BMPs) to include within their Stormwater Pollution Prevention Plan. Please provide input to assist with the identification of effective BMPs and potential sources of information such as "Operation Clean Sweep".*

   Operation Clean Sweep Program Manual (OCS) is a compendium of recommended guidelines for producers and handlers of plastics pellets and powders. In WEAT's opinion, OCS places significant emphasis on good housekeeping practices (non-structural controls), while it is rather limited in terms of providing guidance for pellet and powder containment and removal (structural and source controls).

   As plastics are transported from the point of origin, they become more dispersed in the environment and more difficult to remove or capture. Principles for capture and control such as secondary containment, outlet filtration, detention or capture basins with special outlets designed to skim floatable plastics, and others should be considered in addition to the BMPs identified in OCS.

   A very limited number of structural and source controls are mentioned in OCS. The applicability in terms of operation and maintenance needs for some of the housekeeping practices is not discussed. In our experience, some recommendations may prove labor intensive and, and thus, impractical. Additionally, newer and more practical technologies or higher tech solutions commercially available for source controls are not referenced. Finally, in our opinion, proposed audits and checklists are oversimplified, and frequencies of use for these tools are not suggested. Therefore, it is WEAT's opinion that OCS may serve as a good general reference source, but it is lacking some of the details that permittees may need to ensure compliance.

   WEAT has identified other references that may be helpful to improve facility operations, which in turn may reduce potential releases. Those are provided in the reference section at the end of this document. Although, helpful, these references are geared towards facility operation and do not address specifically stormwater management for plastic operations.

   It is WEAT's opinion that there is currently no comprehensive guidance for appropriate plastic stormwater controls and source controls that may be referenced to the permittee.

4. *Please provide input on additional requirements such as: outfall and receiving water inspections, notification of spills and unauthorized discharges to Regional Office, recovery of released materials from receiving waters, and clarification that the point of compliance for the prohibition on the discharge of plastic is at the final outfall.*
    a. Compliance with a plastics water quality standard, threshold standard, and/or effluent limitations for plastics based on both concentration and mass loading rate basis.
    b. Principles applied in monitoring stormwater discharges should be considered for plastics. Outfalls should be sampled during first flush events and any BMPs located at outfalls should be routinely monitored or inspected. The discharge of plastics from all outfalls identified in a site-specific stormwater pollution prevention plan should be prohibited with maximum permit discharge quantities established based on total load (total mass released).
    c. When a known release of materials exceeding a minimum threshold occurs, the site owner should be required to provide notification of the release to the Regional Office and implement a response plan as a means of recovering the released material from the receiving waters. Such plan should include at least the following:
        i. Require determination of all impacted areas from plastic releases or spills, including all areas downstream that may have been impacted. Include requirement to clean up released materials from all areas impacted, including but not limited to ground areas (including beaches), and receiving waters (streams, bays, bayous, wetlands, marshes), etc.
        ii. Report location, quantities and timeframe for cleanup of released plastics from receiving waters, and other environments (marshes, wetlands, beach areas, etc.)
        iii. Require the use of recovery or cleanup methods that are not detrimental to the environment (e.g., pressure washing used to remove pellets from certain media may be detrimental to the environment.
        iv. Require the permittee with identification and disclosure of root cause of the release and the planned measures to correct the issue. TCEQ should also establish timeliness to correct the issues.
        v. Require post-clean up inspections to document that that all plastics have been removed and that the corrective actions have been fully implemented.
    d. All other requirements as stated in the multi-sector and individual permits including but not limited to
        i. Facility map indicating runoff patterns, stormwater infrastructure, controls and outfalls
        ii. Routine facility inspections (maintain documentation)
        iii. Training on personnel on stormwater good housekeeping practices, spill prevention and control, operation and maintenance of stormwater controls, and other necessary training to prevent unauthorized releases of plastics
        iv. Either rain logs or discharge flow rates
        v. Notification to receiving MS4, etc.

5. *TCEQ is requesting stakeholder input regarding additional time to comply with the prohibition on the discharge of plastic. The Texas Surface Water Quality Standards allow up to a three-year compliance period. TCEQ is proposing that requests for a compliance period must justify the*

need for additional time including a construction schedule to install new control structures or retrofitting existing systems to achieve compliance. If approved, the compliance period will include submission of quarterly progress reports.

Timeframe for compliance must be proportional to the level of effort generally expected to achieve compliance accordingly to the revised regulations. Permittees with multi sector permit and individual permits were likely required to prevent releases from plastics to the environment (discharge of floatables are regulated in their permits). Therefore, it is expected that the new regulation may require upgrades to already existing controls.

WEAT recommends that TCEQ requires permittees to justify timelines and allow a maximum of three-year compliance period to require implementation of monitoring and BMPs to address treating plastics as a pollutant. However, the ultimate appropriate compliance period should be informed by the further development of regulatory language in order to better identify required investments to comply with such standards.

Thank you for the opportunity to provide feedback. Please contact Julie Nahrgang at 210.325.3087, Gian Villarreal at 210.446.6865, or Aiza Jose at 214.9868745 with any questions.

Sincerely,

Aiza Jose

Stormwater/Watershed Protection Committee Co-Chair,

Gian Villarreal

Stormwater/Watershed Protection Committee Co-Chair

Julie Nahrgang

WEAT/TACWA Executive Director

Cc: Rick Hidalgo, WEAT President
Ron Patel, TACWA President

REFRENCES

Operation Clean Sweep, Plastics Industry Association (PLASTICS) and American Chemistry Council®, 2017 https://www.opcleansweep.org/

Microplastics in Drinking Water, World Health Organization (WHO), 2019 https://www.who.int/water_sanitation_health/publications/microplastics-in-drinking-water/en/

Background document on pre-production Plastic Pellets, The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), 2018 https://www.ospar.org/documents?v=39764

Scientific Perspective on Microplastics in Nature and Society , Science Advice for Policy by European Academies (SAPEA) consortium, 2019 https://www.sapea.info/wp-content/uploads/report.pdf

Size matters more than shape: Ingestion of primary and secondary microplastics by small predators, Lehtiniemi, M; Hartikainen, S.; et. al. (2018); https://doi.org/10.1016/j.fooweb.2018.e00097

CEFIC/ECTA and Plastics Europe reference documents for plastics materials handling practices https://www.ecta.com/resources/Documents/Best%20Practices%20Guidelines/Guidelines-Safety-Quality-Guidelines-for-Unloading-Polymers-in-Bulk-1-September-2016.pdf

Safety and Quality Best Practice Guidelines for unloading polymers in bulk, 2016

Best Practice Guidelines for the safe working at height in the logistics supply chain and allied sectors

Best Practice Guidelines for safe (Un)Loading of Road Freight Vehicles, covering Technical, Behavioral and Organizational aspects

Best Practice Guidelines for Cleanliness of Rotary Valve and Unloading equipment for Bulk deliveries

Best Practice Guidelines for the safe tipping of Silo trucks/ Trailers/ silo Containers and Bag-In- Box containers

Best Practice Guidelines for the Safe Use of “Lined” Iso Box Containers for Movement of Dry Bulk Product