Plastics Recycling Facilities
Waste Water Treatment

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PASSION FOR CHEMISTRY

Plastics Recycling Basics

- After sorting, PRF's have various processing lines that de-label, shred, hot water wash and create recycled plastic pellets that are sold as raw materials for plastics packaging manufacturers.
- The Wash water needs to be soft but not too soft otherwise the surfactants won't rinse off.
- The heat is generated by boilers that need demin water
- PP, PE, HDPE and PET are some of the plastics that are normally recycled
- High pH chemicals are used and surfactants for washing/delabeling
- The Waste water produced is high in pH, sediments, organics, microplastics
- Many times after pH correction with H_2SO_4 or HCl the waste water becomes high in Sulphates or Chlorides
- Quality control labs in the PRF's ensure that the plastic pellets generated are of the proper quality.

Plastics Recycling Basics

- A good site waste water drainage/management plan is needed as PRF's are fill of debris and it gathers with the rain/surface run off
- Some PRF's are attached to EfW sites that burn municipal waste or their own plastic recycling processing waste.

Site Pics

Waste Water Treatment

- pH correction (pH lowering is needed): H_2SO_4 and HCl are cheap but harsh chemicals that add anions to the water
- CO_2 dosing is environmentally friendly but has expensive OPEX and CAPEX.
- Screening us used to remove plastic fines
- DAF/Coagulation-Flocculation-Settling is used to remove suspended solids and settle grit
- Biological processes are used to lower the BOD which comes from food contaminants in various food packaging
- UF or some kind or MMF/UF is needed before the desalination phase
- RO Technology is used to recover pure water from the wastewater

Biological Processes

- ASP, SBR, MBBR or MBR can be used
- The basic principle is to use aerobic bacterial biomass to break down the BOD into CO2 and water.
- COD is more difficult to treat and might require anaerobic treatment or dosing of GAC/PAC. Some suppliers offer Electro-Oxidation (EAOP)

RO Reject or Brine Management

- The reject from the RO process contains all the rejected concentrated ions
- Depending on the recovery rate the concentration is doubled or quadrupled. With a 10% rejection rate, concetration is increased Tenfold
- If the ionic concentration in the brine are above discharge limits, it needs to be taken off site or treated/concentrated further
- Brine treatment with RO is possible or Evaporation/Crystallization can be used to recover even more water.
- HIGH-PRESSURE RO is new in the market and can concentrate RO reject further.

Sludge Dewatering/Washing Line Reject

- DAF's and Washing Lines produce a lot of plastic/paper waste that needs to be dewatered to save disposal costs. Presses/Centrifuges and used.

Suppliers of Waste Water Treatment Systems/Chemicals/Chemical Dosing

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