Stormwater BMP Literature Search

For Compost Facilities

Environmental Assistance Office

Infrastructure, Design, Environment, and Sustainability (IDEAS) Center

UNC Charlotte

Submitted to

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Introduction

The Infrastructure, Design, Environment, and Sustainability (IDEAS) Center and Environmental Assistance Office (EAO) was contacted by the Mecklenburg County Solid Waste Department to research the fecal content of runoff from composting sites and different BMP's most effective in the removal of fecal content from stormwater runoff. Below is the information compiled during research.

Research Results:

Composting Site Information

http://books.google.com/books?id=ycIlZZC6FDsC&pg=PA68&lpg=PA68&dq=municipal+compost+site+runoff&source=bl&ots=qrv-On0zkn&sig=CHNQCOVMG-YgFochgd3E64c5zAA&hl=en&ei=GCChSuPUKJmy8QbG2-H0Dw&sa=X&oi=book_result&ct=result&resnum=7#v=onepage&q=municipal%20compost%20site%20runoff&f=false

This is chapter 6 of the EPA guidebook which deals with runoff from municipal composting sites and the different ways to maintain water quality of the surrounding area. The link shows good graphics regarding management of runoff from composting sites. It does not refer to fecal matter content directly but the principles are the same for the BMP's.

http://www.cwc.org/organics/organic_htms/cm002rpt.htm

This is a link to a research report regarding the treatment of runoff from two different composting sites. The first composting site was a Zoo which had very high fecal matter content in their runoff, so they treated the runoff by pasteurizing it and selling it as a fertilizer to local gardeners. This was a very interesting and sustainable way to treatment runoff from a composting site. The report also goes into BMP's that are useful in reducing runoff, mainly diverting as much runoff around the site as possible so the least amount of rainfall hits composting material.

http://www.epa.gov/nrmrl/pubs/625r92013/625R92013chap7.pdf

This is an EPA report that goes over the proper way to compost to remove as much fecal matter as possible to reduce any runoff threats. It reviews the techniques and process that will eliminate the most fecal content possible so runoff contains the lowest amount of fecal content possible.

http://compost.css.cornell.edu/waterqual.html

This website goes over the best way to protect water from composting sites. It is research done by Cornell University so information should be very accurate. From the report it suggests that runoff be treated with rain gardens and infiltration berms. Using infiltration BMP's is the most effective way in treating runoff from composting sites.

http://www.bmpdatabase.org/BMPPerformance.htm

This website has all the data needed for evaluating BMP's and their performance in removing different pollutants and bacteria's from storm water runoff.

- BMP efficiency in removing bacteria from Stormwater runoff
- BMP removal efficiency of common pollutants from Stormwater runoff
- 20 page report summarizing the performance of different BMP's
- Summary of cost for different BMP's

http://www.bae.ncsu.edu/stormwater/PublicationFiles/PathogensSW.2008.pdf

Great research report on studies being conducted now on how to remove pathogens from Stormwater runoff and the research that still needs to be done. It is pretty inconclusive due a need for more research and understanding the best ways to treat storm water runoff for pathogens.

BMP Information

Storm water BMPs (Best Management Practices) can be utilized to detoxify water runoff from storms otherwise hazardous to the local ecosystem. As storm water rolls down hills, streets, crops, animal habitats and other biologically concentrated environments, chemical residues and microbial bacteria accumulate, polluting that water which eventually seeps into soil causing contamination. BMPs help control the direction of water runoff and can store that water in a closed system. The removal of each contaminant is then evaluated on an individual basis for proper steps to eradicate those substances from the water.

http://www.ncstormwater.org/pages/stormwater_faqspage.html

This website is a copulation of different stormwater facts and why the treatment and control of runoff is important for water quality and a healthy community.

http://www.stormwatercenter.net/

This website provides a detailed explanation of everything from planning to methods of dealing with stormwater. Entering the library reference section allows access for very thorough research however there is a fee for each article.

http://www.charmeck.org/Departments/StormWater/Projects/Torrence+Creek+BMP+Project.htm

This website gives some local insight to runoff practices. Torrence Creek uses three "rain gardens" to capture runoff. That water is then allowed to seep into special soils built to handle this runoff. Total cost for Torrence Creek BMP: $289,000.

http://www.eng.uci.edu/files/06-2Cris%20et%20.pdf

This report is a comprehensive study on fingerprinting flow of fecal bacteria to assess where most fecal contamination is originating from.

http://cws.msu.edu/documents/MicrobialSourceTrackingWhitePaper.pdf

The methods of sourcing microbes are given in this study.

http://www.udfcd.org/downloads/pdf/tech_papers/Can%20Stormwater%20BMPs%20Remove%20Bacteria.pdf

This study deals with BMP's removing bacteria from runoff.

http://wms.geonorth.com/library/Documents/PublicEducation/03_coliform_doc2.pdf

A wealth of information is provided here via water runoff in Anchorage, Alaska and techniques used to identify and treat contamination.

http://www.hanesgeo.com/files/documents/doc65.pdf

This report is on a study of the commercial product the Smart Sponge, a product that extracts hydrocarbons from water. The Smart Sponge Plus has antimicrobials anchored to it that can recognize and bind with E. coli, fecal coliform, and other harmful bacteria.

Additional Literature Attachments:

Managing Storm Water. *BioCycle*. February 2008 (See Attachment)

The article discusses how storm and waste waters are handled at a large scale composting facility. The author highlights the difficulties of handling and evaluating such water, including testing and sampling the water, legal categories involved in handling the water, and the contamination of materials being used in the compost. The author also presents the science and statistical methodology involved in computing quantities of water runoff from the soil of the facility and attaining a representative sample from the runoff.

STORM WATER MANAGEMENT REGULATIONS. *BioCycle* May 2008 (See Attachment)

The article focuses on U.S. regulations concerning storm water management. Similarities between storm water permits and permits granted through the National Pollutant Discharge Elimination System (NPDES), created by the Clean Water Act of 1972, are discussed. Particular focus is given to challenges faced by composting facilities that do not fall under government regulated industry categories. Storm water regulations governing the compost industry from several states are examined, including regulations from Kansas, Missouri, North Carolina, and Oregon.

CONTROLLING STORMWATER RUNOFF FROM COMPOSTING SITE. *BioCycle*. June 2001. (See Attachment)

This article discusses the acceptable options for controlling stormwater runoff from composting sites. Provisions of a typical runoff control system; Options for diversion of clean runoff; Methods for collecting dirty runoff.

`Leachate tea' from yard trimmings improves plant growth. *BioCycle*. September 1996 (See Attachment)

Reports on the beneficial use of runoff from yard trimmings compost facilities as plant fertilizer. Comparison of effects of leachate and commercial fertilizer of the growth of marigolds and radishes; testing on vegetables.