



Composting Facilities: The Management of Effluent

Presented by

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Presented to

Cré

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Summary of Presentation

- Effluents generated
- Effluent Composition
- Treatment Options
- Combined in-vessel/ASP facility example

Effluent Types

- Primary Leachate
- Secondary Leachate
- Wash-down
- Condensates
- Clean storm water
- Contaminated storm water

Effluent Composition

Constituent	Mixed Facilities* (Ranges mg/L unless noted)
Ammonia	32-1,900
Biochemical Oxygen Demand (BOD ₅)	20-46,000
Chloride	52-2,100
Color	1,000-70,000 color units
Conductivity	887-16,500
Copper (total)	0.033-0.82
Faecal coliforms	200-2.4x10 ⁷ MPN/100mL
Nitrate+nitrite N	0-8
Ortho Phosphate	0-90
pH	6.7-9.5
Phosphorus (total)	4-170
Potassium	170-4,600
Total Kjeldahl Nitrogen (TKN)	14-3,000
Total Suspended Solids (TSS)	1,100-20,000
Zinc (total)	0.1-1.5

Variability

Date Sampled	pH (S.U)	TSS (mg/L)	O&G (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)	E. Coli (counts/100mL)	Total P (mg/L)	BOD ₅ (mg/L)
December 13, 2000	8.2	34	3.6	0.023	0.022	0.050	ND	NT	39
November 28, 2001	6.5	650	ND	0.056	0.14	0.39	400,000	4.6	120
December 13, 2001	8	240	5.9	0.065	0.21	0.39	960	0.76	5.0
December 13, 2001	6.5	260	4.9	0.072	0.40	0.38	960	1.0	940
March 19, 2002	8.0	18	ND	ND	0.030	ND	12	0.99	4.0
March 19, 2002	6.6	530	4.9	0.097	0.31	0.42	>2,400	1.3	18
December 11, 2002	6.7	500	ND	0.058	0.02	0.47	>16,000	0.57	67
March 6, 2003	7.2	520	ND	0.062	0.15	0.34	>16,000	2.1	32
April 23, 2003	5.3	5,000	23	0.450	0.53	2.4	>240,000	250.00	250

Discharge issue?



EPA Discharge Requirements

- pH 6-9
- BOD <20 ppm
- Suspended Solids <30 ppm
- Total Nitrogen <15 ppm
- Ortho-Phosphorus <1 ppm
- Temperature < 23°C

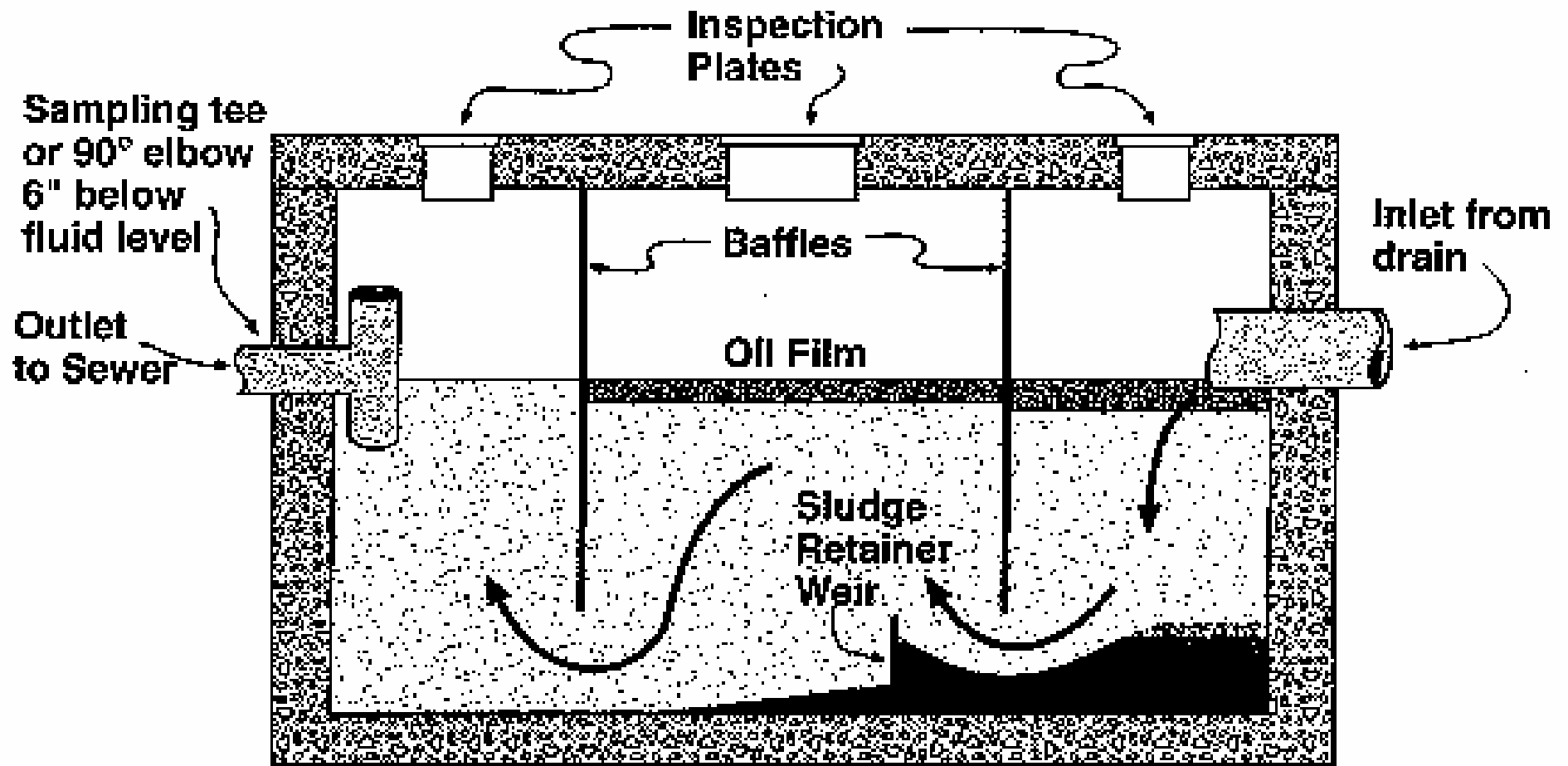
Pavement



Sediment Basin



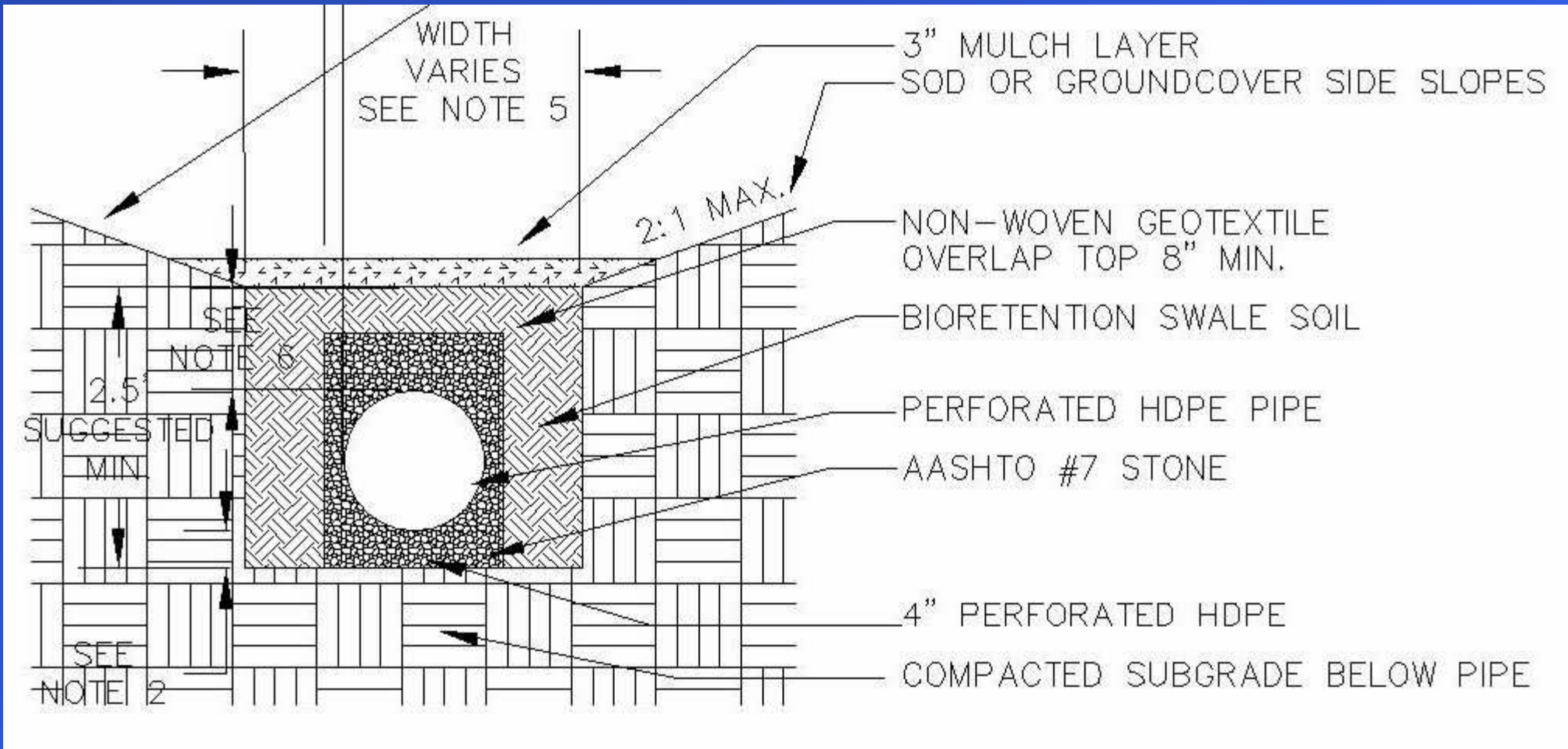
Grease traps / Septic tanks



Wetlands & Bioswales



Bioswale



Compost Filter Berm



Holding Pond



Biological treatment



Practical Effluent Options

Full enclosure



Roofing

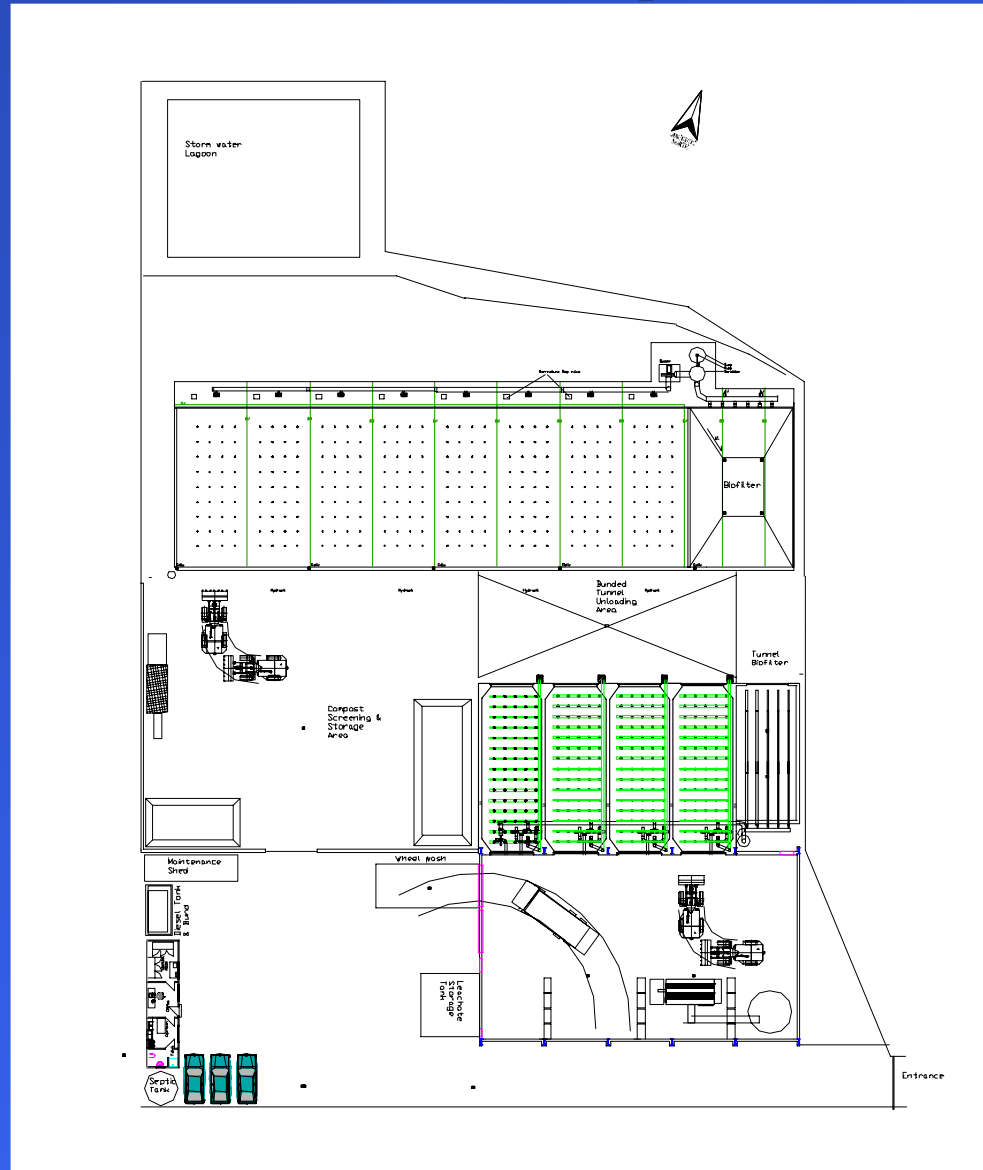


Collection and Reuse

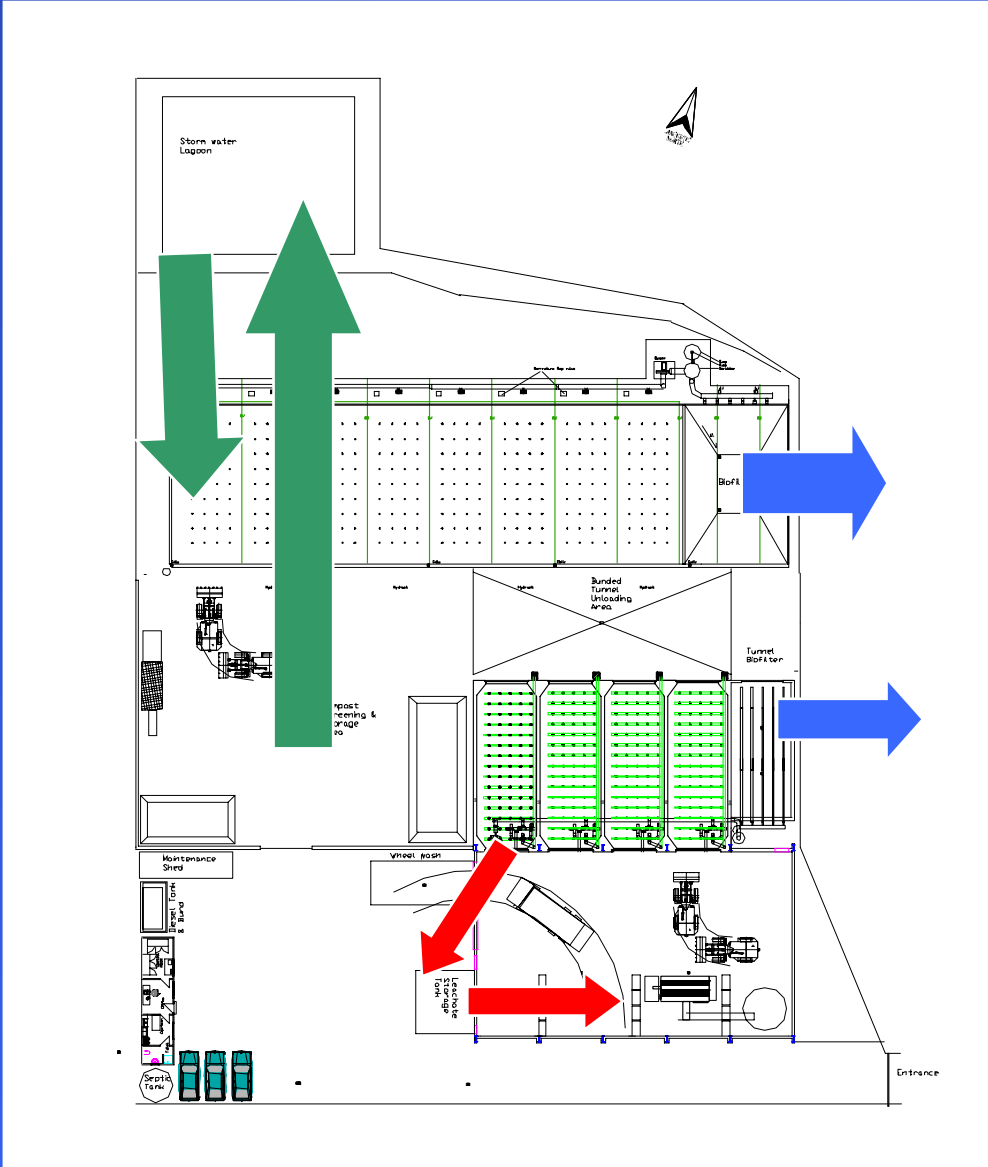


**Practical Example:
In-vessel Facility with Outdoor Curing
(Maximizing Effluent Re-use)**

Broadpath In-vessel Compost Facility



Effluent Cycles



Primary Leachate Recirculation



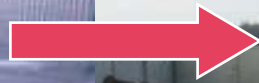
Harnessing Evaporation



Aerated “Dynamic” Pile



Storm-water



Bio-drying

- Forced aeration encourages vigorous aerobic microbial activity
- Moisture content can subsequently fall by 10% in 14 days
- 1,000 m³ plies can consequently consume in excess of 50 m³/week to maintain moisture balance
- Facilities can be designed to harness these “evaporative engines” in the management of effluents.