MERRILLVILLE

RECYCLED PIPE PROGRAM FOR STORMWATER INFRASTRUCTURE

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Executive Director

New Recycled Pipe Standards

- The Merrillville Stormwater Utility implemented a new standard for town-owned stormwater infrastructure projects by incorporating pipe that contains at least 40% recycled high-density polyethylene (HDPE)

- Designed to meet 100+ year service


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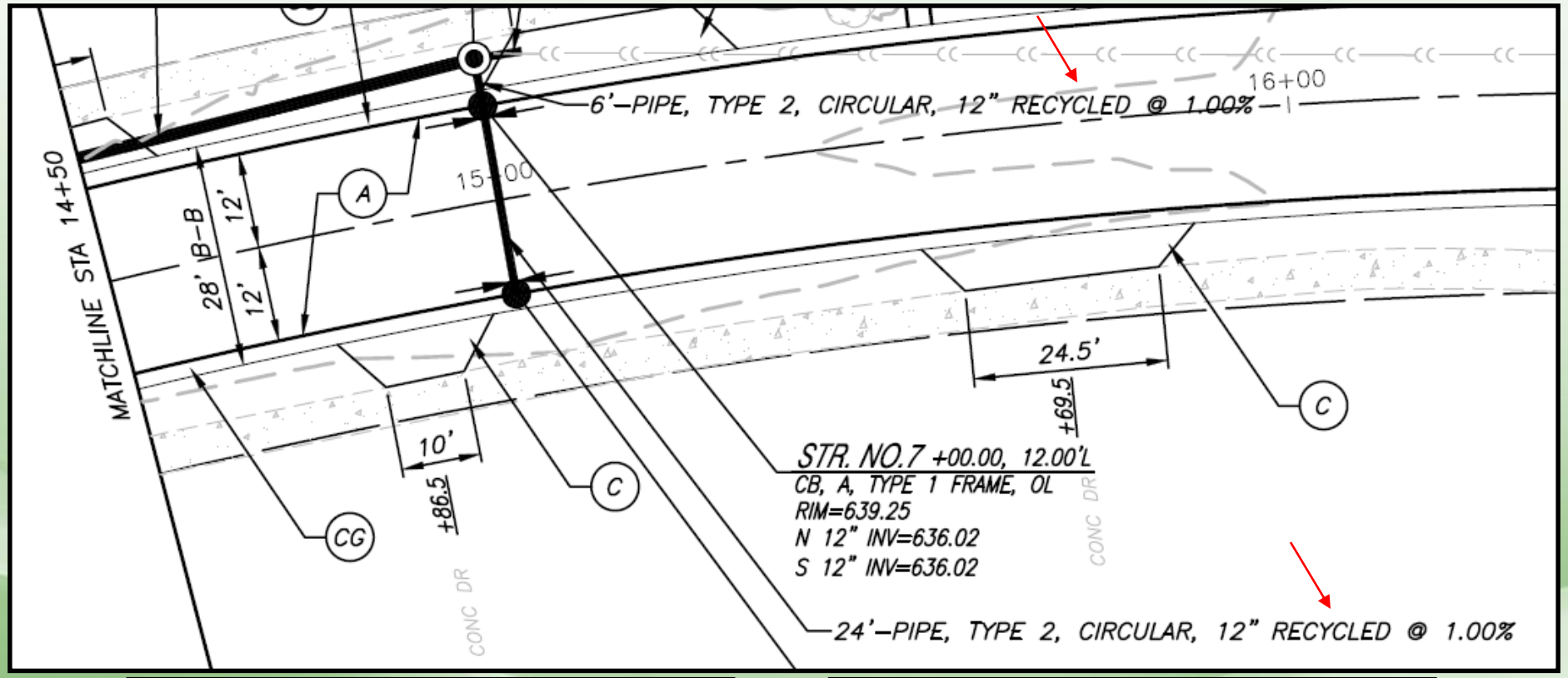
Revised Standards for Town Stormwater Infrastructure Projects

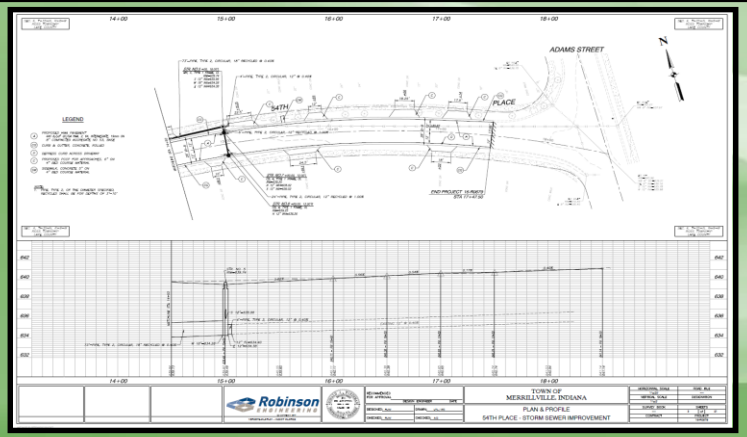
PIPE, TYPE 3, CIRCULAR, OF THE DIAMETER SPECIFIED

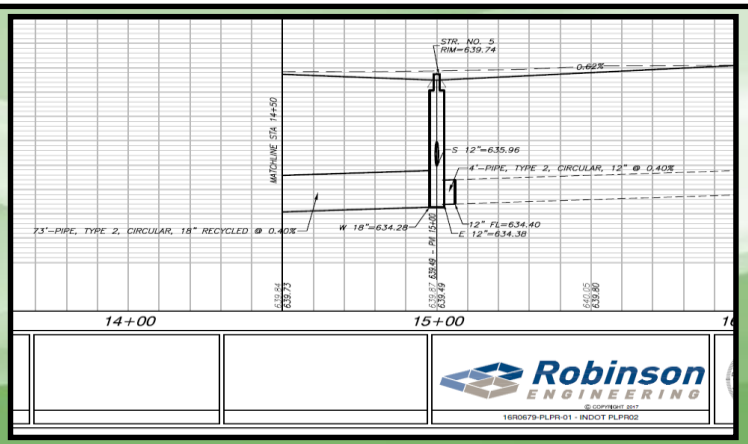
Description. This work shall include all labor, materials and equipment to install storm sewer pipe. This work will be completed according to Section 715 of the Standard Specifications and as modified below.

Corrugated High Density Polyethylene Pipe – Recycled. Pipe manufactured for this specification shall be ECOFLO 100 or approved equivalent containing a minimum of 40% recycled HDPE and shall be designed to meet 100-year service life protocol. The pipe shall comply with the requirements for test methods, dimensions, and markings found in AASHTO M252 Type S for 4" – 10" diameters and AASHTO M294 Type S or ASTM F2306 for 12" – 60" diameters. As further defined and described in AASHTO M252, AASHTO M294 and ASTM F2306, the prescribed sizes of pipe are nominal inside diameters. Pipe, 4" – 60", shall be manufactured using compounded HDPE with a minimum recycled content of 40% meeting minimum cell classification requirements of 435400C or 435400E as defined and described in ASTM D3350, except the carbon black content shall not exceed 4%. The HDPE pipe material shall be tested for slow crack growth resistance using the notched constant ligament-stress (NCLS) test as specified in sections 9.4 and 5.1 of AASHTO M294 and ASTM F2306, respectively. Average failure time of the five test specimens shall not be less than 32 hours.

Engineering Plans







Recycled Material for HDPE Pipe

Post Consumer Recycled Materials

- Materials From Products that Have Served a Previous Consumer Purpose
- Can Be Provided in Flake or Reprocessed Pellets

Infrastructure Improvements

- **Merrillville has over 6,000 inlets and over 800,000 feet of storm drains that are continuously maintained.**
- **We continue to invest in new infrastructure throughout the town to manage stormwater quantity & quality.**

Stormwater Master Plan

- Stormwater 20-Year Master Plan
- Conducted drainage studies for each sub-watershed area
- Identified and prioritized capital improvement projects estimated **over 24 million dollars that will utilize recycled pipe**

- Meadowdale Lateral Subwatershed - $3,887,694.60
- Kaiser Ditch Subwatershed - $8,357,638.80
- Chapel Manor Subwatershed - $8,674,335.00
- North Central Turkey Creek Subwatershed - $1,662,824.10
- Northeast Turkey Creek Subwatershed - $2,328,060.00
- **TOTAL - $24,910,552.50**

Land Use	TSS	TP	TKN	NH3-N	BOD	COD	Lead	Zinc	Cu
Commercial	1000	1.5	6.7	1.9	62	420	2.7	2.1	0.4
Parking Lot	400	0.7	5.1	2.0	47	270	0.8	0.8	0.04
High Density Residential	420	1.0	4.2	0.8	27	170	0.8	0.7	0.03
Medium Density Residential	190	0.5	2.5	0.5	13	72	0.2	0.2	0.14
Low Density Residential	10	0.04	0.03	0.02	NA	NA	0.01	0.04	0.01
Freeway/Interstate	880	0.9	7.9	1.5	NA	NA	4.5	2.1	0.37
Industrial	860	1.3	3.8	0.2	NA	NA	2.4	7.3	0.50
Park/Open Space	3	0.03	1.5	NA	NA	2.0	0.0	NA	NA
Construction	6000	80	NA	NA	NA	NA	NA	NA	NA

Table 5. Typical Pollutant Loadings from Runoff by Urban Land Use (lbs/acre-yr). *EPA, Honer et al, 1994*

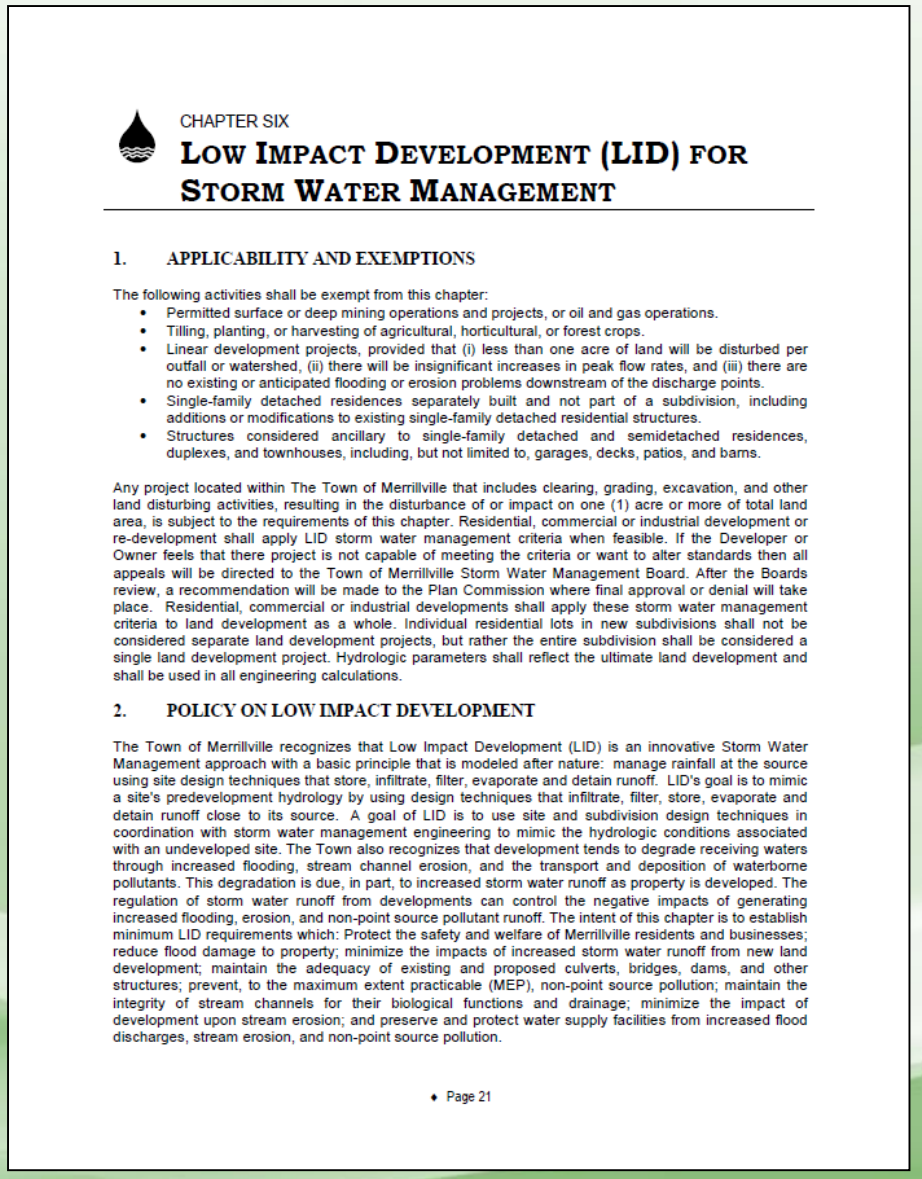
Merrillville Low Impact Development Standards

- First Community in NW Indiana to develop and implement Low Impact Development Standards
- LID was added intentionally as a separate chapter so it's not overlooked
- LID implementation is required to get a Stormwater Permit
- Recycled pipe is now accepted for compliance
- Often results in meetings with developers and engineers prior to detailed site design

LID Chapter

Added Chapter 6 - Low Impact Development for Storm Water Management

- Establishes additional BMP criteria for development and redevelopment projects
- Innovative SW management approach modeled after nature and incorporation of infiltration
- Improved Site Design + Storm Water Management Engineering = mimic pre-development hydrologic conditions



CHAPTER SIX

LOW IMPACT DEVELOPMENT (LID) FOR STORM WATER MANAGEMENT

1. APPLICABILITY AND EXEMPTIONS

The following activities shall be exempt from this chapter:

- Permitted surface or deep mining operations and projects, or oil and gas operations.
- Tilling, planting, or harvesting of agricultural, horticultural, or forest crops.
- Linear development projects, provided that (i) less than one acre of land will be disturbed per outfall or watershed, (ii) there will be insignificant increases in peak flow rates, and (iii) there are no existing or anticipated flooding or erosion problems downstream of the discharge points.
- Single-family detached residences separately built and not part of a subdivision, including additions or modifications to existing single-family detached residential structures.
- Structures considered ancillary to single-family detached and semidetached residences, duplexes, and townhouses, including, but not limited to, garages, decks, patios, and barns.

Any project located within The Town of Merrillville that includes clearing, grading, excavation, and other land disturbing activities, resulting in the disturbance of or impact on one (1) acre or more of total land area, is subject to the requirements of this chapter. Residential, commercial or industrial development or re-development shall apply LID storm water management criteria when feasible. If the Developer or Owner feels that there project is not capable of meeting the criteria or want to alter standards then all appeals will be directed to the Town of Merrillville Storm Water Management Board. After the Boards review, a recommendation will be made to the Plan Commission where final approval or denial will take place. Residential, commercial or industrial developments shall apply these storm water management criteria to land development as a whole. Individual residential lots in new subdivisions shall not be considered separate land development projects, but rather the entire subdivision shall be considered a single land development project. Hydrologic parameters shall reflect the ultimate land development and shall be used in all engineering calculations.

2. POLICY ON LOW IMPACT DEVELOPMENT

The Town of Merrillville recognizes that Low Impact Development (LID) is an innovative Storm Water Management approach with a basic principle that is modeled after nature: manage rainfall at the source using site design techniques that store, infiltrate, filter, evaporate and detain runoff. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate and detain runoff close to its source. A goal of LID is to use site and subdivision design techniques in coordination with storm water management engineering to mimic the hydrologic conditions associated with an undeveloped site. The Town also recognizes that development tends to degrade receiving waters through increased flooding, stream channel erosion, and the transport and deposition of waterborne pollutants. This degradation is due, in part, to increased storm water runoff as property is developed. The regulation of storm water runoff from developments can control the negative impacts of generating increased flooding, erosion, and non-point source pollutant runoff. The intent of this chapter is to establish minimum LID requirements which: Protect the safety and welfare of Merrillville residents and businesses; reduce flood damage to property; minimize the impacts of increased storm water runoff from new land development; maintain the adequacy of existing and proposed culverts, bridges, dams, and other structures; prevent, to the maximum extent practicable (MEP), non-point source pollution; maintain the integrity of stream channels for their biological functions and drainage; minimize the impact of development upon stream erosion; and preserve and protect water supply facilities from increased flood discharges, stream erosion, and non-point source pollution.

Points System for LID

- Each BMP has a point value based on quantity
- A score of 100 LID Points must be achieved for every acre of land disturbance
- Projects not capable of meeting criteria can appeal to SWMB

Table 6-1: LID Point System for evaluating acceptable water quality BMPs

Factsheet #	LOW IMPACT DEVELOPMENT BMP	Quantity	LID Points
PC-101	Bio-Retention Facility (Rain Garden)	100sf	20
PC-102	Catch Basin Inserts	1ea	10
PC-103	Cistern / Dry Well	1ea	10
PC-104	Constructed Wetland	100sf	20
PC-105	Dry Extended Detention Basins	100sf	20
PC-106	Infiltration Basin	100sf	10
PC-107	Infiltration Trench	100sf	10
PC-108	Media Filtration	1ea	10
PC-109	Storm Drain Inserts/ Hydrocarbon Filter	1ea	10
PC-110	Vegetated Filter Strips	100sf	10
PC-111	Vegetated Swales	100 linear ft.	10
PC-112	Wet Ponds / Retention Basins	100sf	20
LID-101	Pervious Pavement With Infiltration Bed	100sf	10
LID-102	Vegetated Roof	100sf	15
LID-103	Level Spreaders	100 linear ft	15
LID-104	Hydrodynamic Separator	1ea	50
LID-105	Two Stage Ditch	100 linear ft	15
LID-106	Riparian Buffer Restoration	100sf	5
LID-107	Wetland Restoration/Creation	100sf	20
LID-108	Cluster Design	1ac	10
LID-109	Open Space Conservation	100sf	10
LID-110	Sensitive Area Protection	100sf	10
LID-111	Design for LEED Certification	1ac	20
LID-112	Native Revegetation	100sf	10
LID-113	Stormwater Disconnectivity	1ea	5-commercial 1-residential
LID-114	Additional Tree Installation	1ea	5
LID-115	Soft Armoring	100sf	20
N/A	Emerging Technology	variable	variable

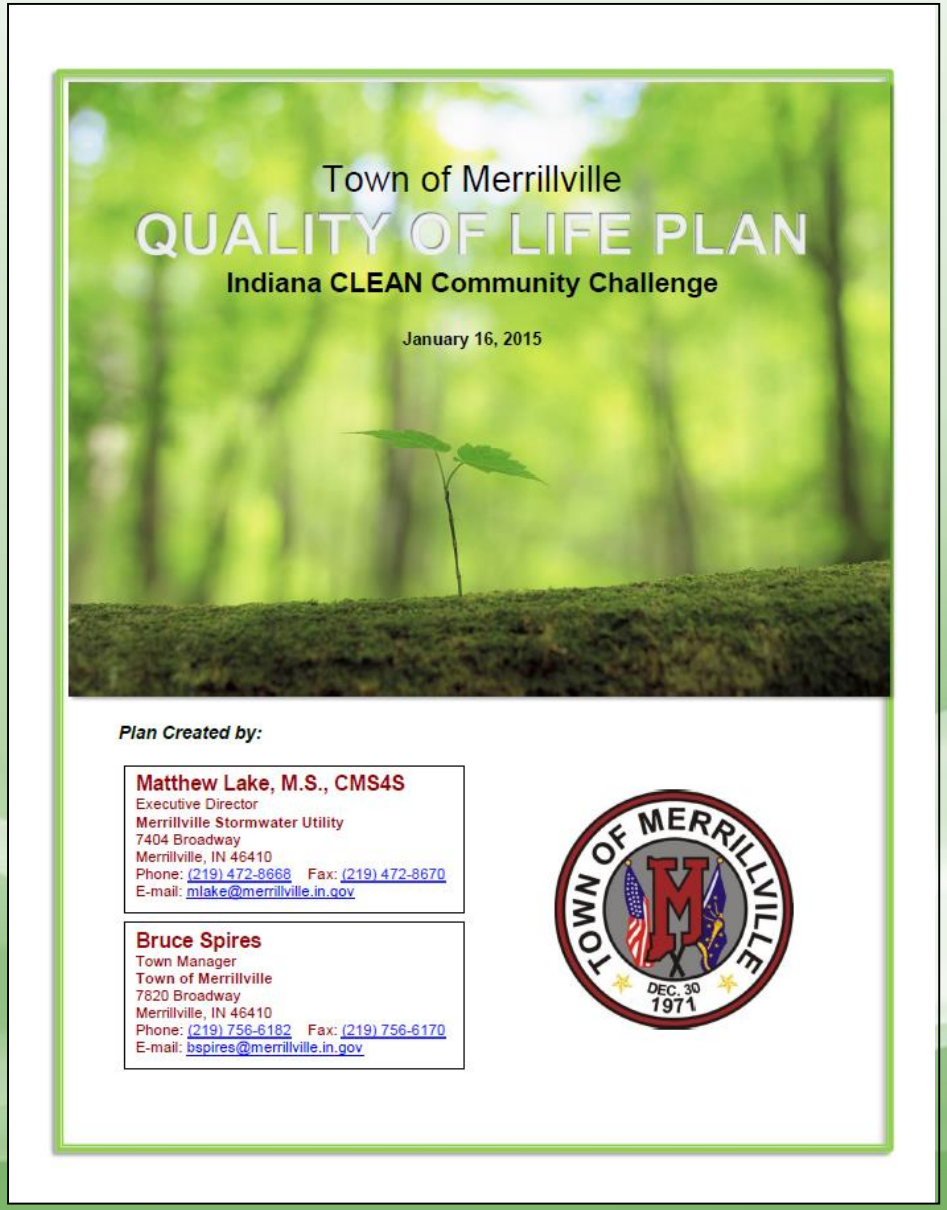
LID Stormwater Plan Reviews

- All plans for new development are reviewed for stormwater quantity and quality requirements

- Meetings with the engineer and developer to validate all requirements including LID **(100 LID Points for each disturbed Acre)** which includes opportunities to incorporate recycled pipe

IDEM Clean Community

- Merrillville is a designated IDEM Clean Community
- Meet goals to improve the quality of life (new goal will include recycle pipe quantities)
- Voluntary recognition program that recognizes and rewards Indiana communities for proactively managing environmental impacts associated with governmental operations



Sustainable Solutions

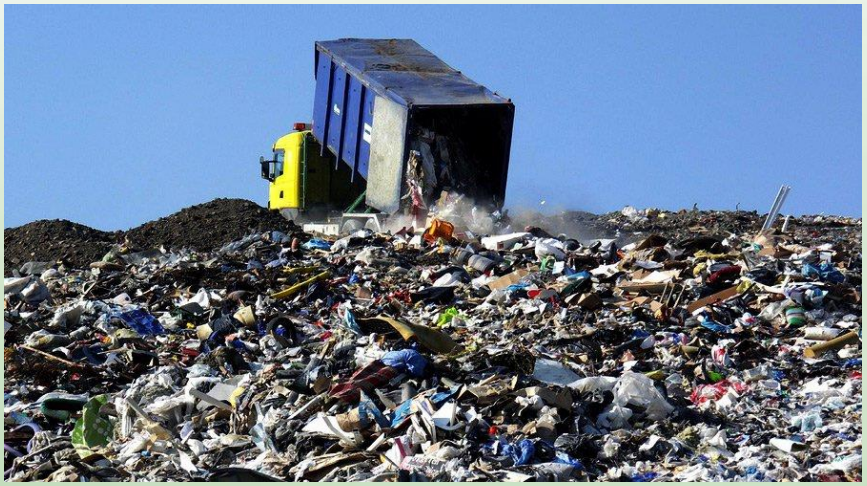
Service Life

Milk Jug = less than 6 Months

Service Life

HDPE Pipe = more than100 years

Reduce Waste in Landfills



One 20’ section of 48” ECOFLO100 Pipe

- **Uses over 240 lbs of <u>recycled</u> HDPE**
- **3.6 cubic yards of landfill space!**

Lower Dependence on Foreign Oil

One 20’ section of 48” ECOFLO100 Pipe

- **Conserves over 82 gallons of oil!**

Let’s not bury problems in landfills but create solutions!

Thank You

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