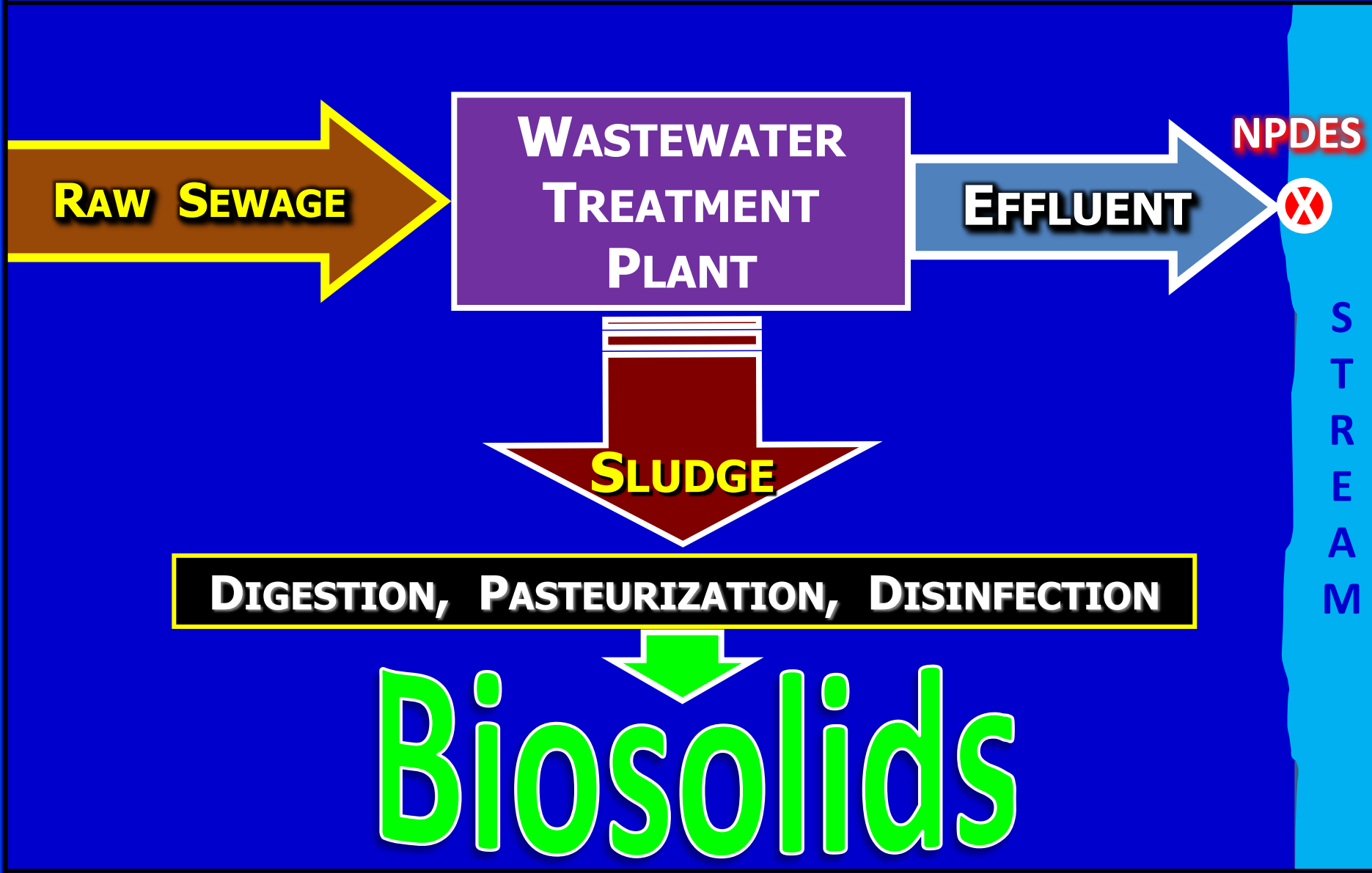
Robert G. "Bob" O'Dette, M.S., P.E.

State Biosolids Coordinator

TN Department of Environment & Conservation

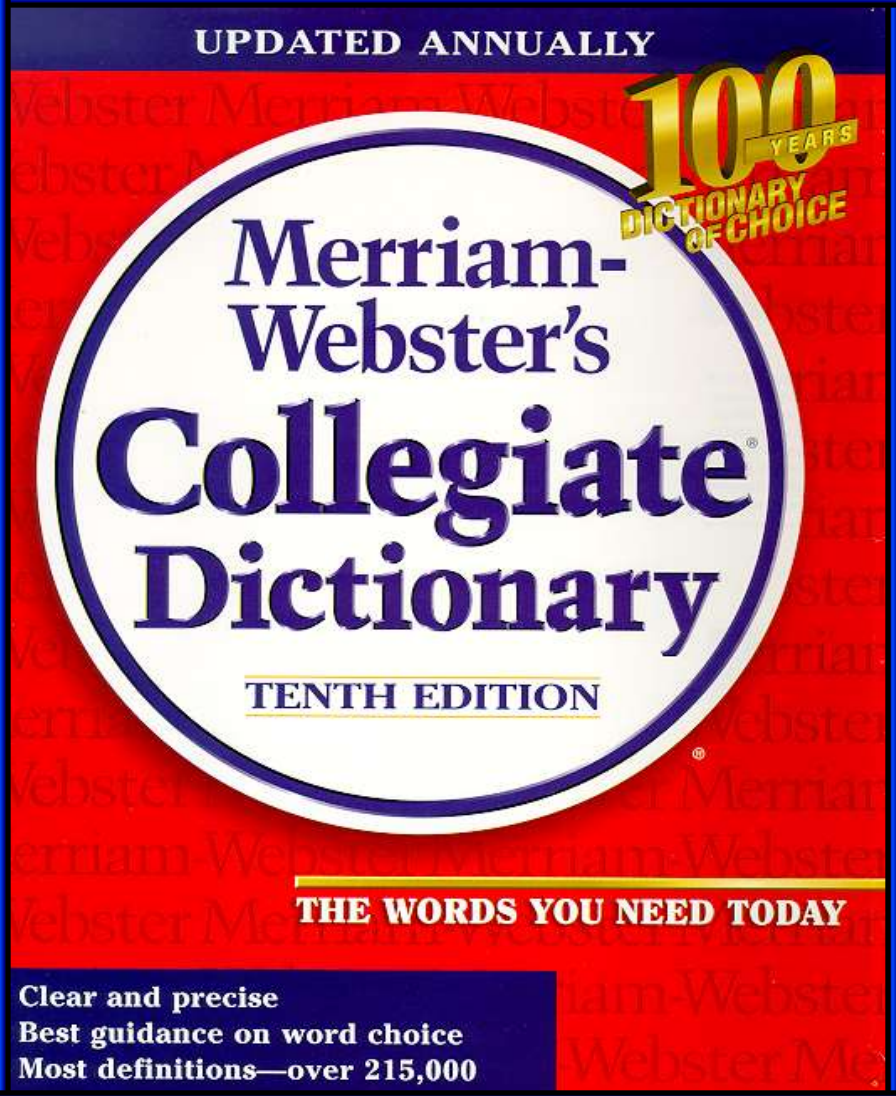
What are Biosolids ?

Typical Wastewater Treatment Plant

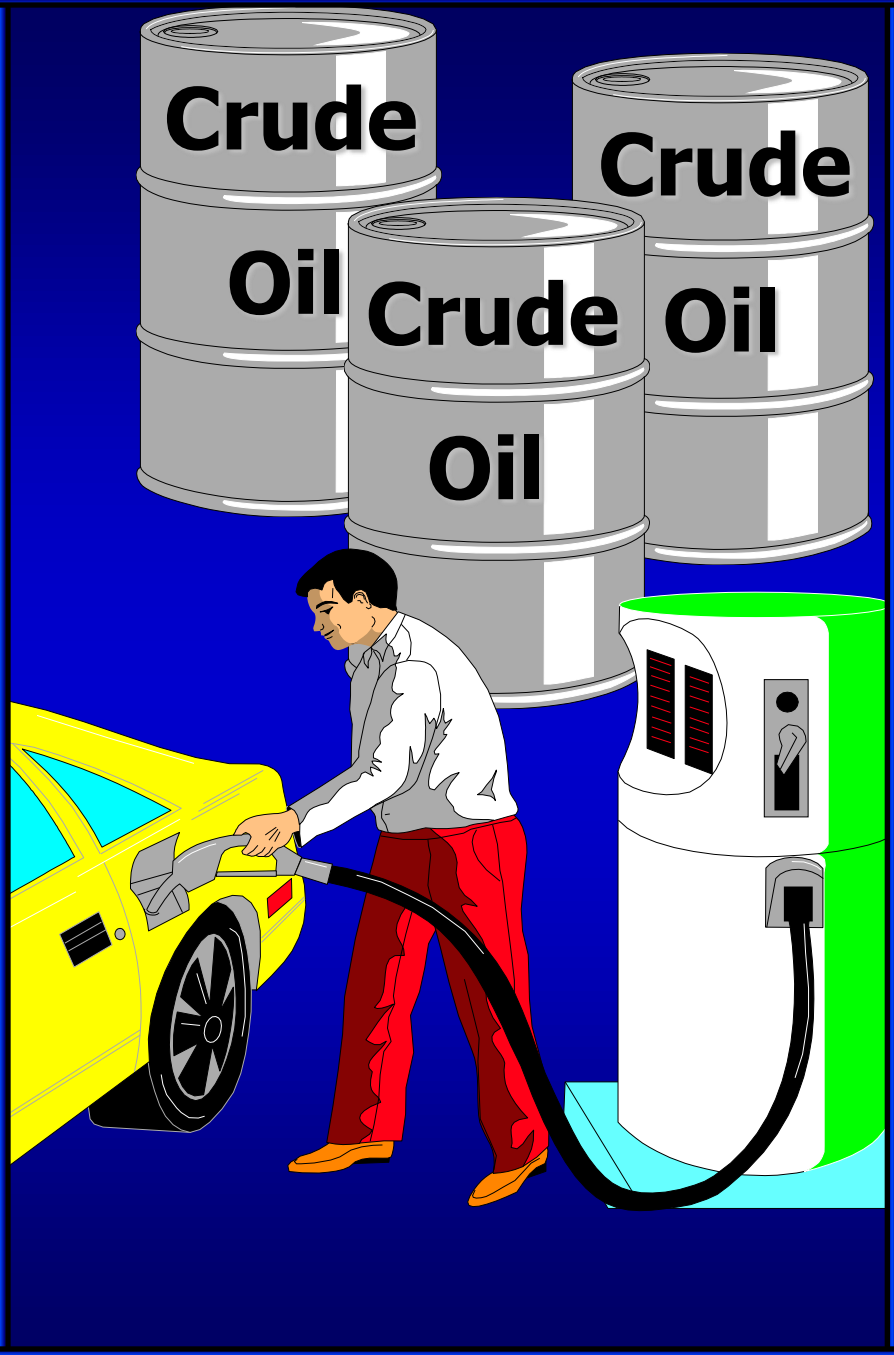


BIOSOLIDS

Biosolids



Solid Organic Matter recovered from a sewage treatment process and used **esp. as fertilizer.**



Biosolids

are no more

Sludge

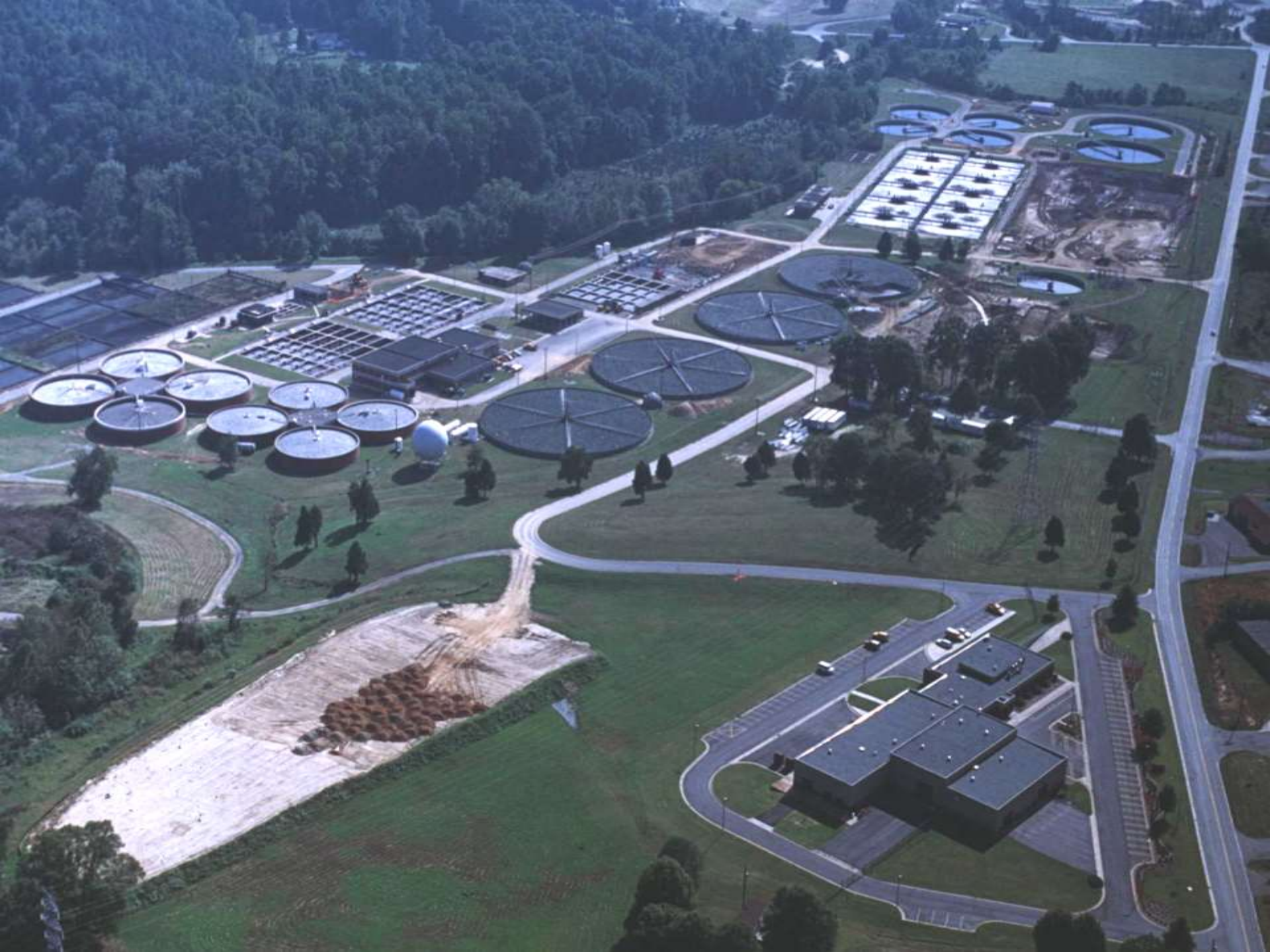
than

Gasoline

is

Crude Oil

It's Great to be in



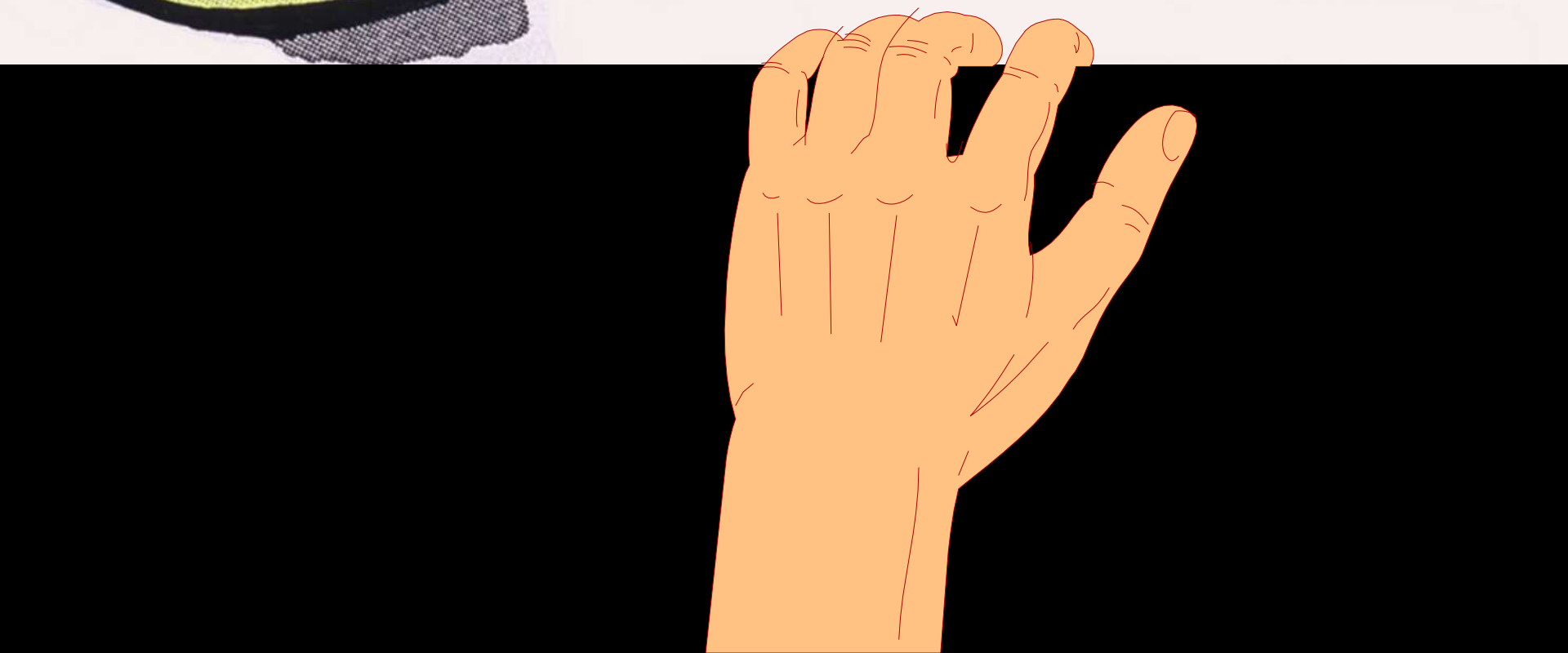
CAUTION

KNIGHT

KNIGHT

It's Starting to get Deep

In Some Places



Biosolids in Tennessee

State Rules and General Permit

For the Land Application of Biosolids

TN Department of Environment & Conservation

Tennessee Biosolids Rules
Chapter 0400-40-15

New Rules

Chapter 0400-40-15
Biosolids Management

Table of Contents

0400-40-15-.01 General Provisions
0400-40-15-.02 Land Application
0400-40-15-.03 Surface Disposal
0400-40-15-.04 Pathogens and Vector Attraction Reduction
0400-40-15-.05 Reserved
0400-40-15-.06 Permitting
0400-40-15-.07 Fees

0400-40-15-.01 General Provisions [40 CFR 503 Subpart A]

(1) Purpose and Applicability [40 CFR 503.1]

(a) Purpose

1. These Rules establish standards, which consist of general requirements, contaminant limits, management practices, and operational standards, for the final application or disposal of biosolids and sewage sludge generated during the treatment of domestic sewage in a wastewater treatment works. Standards are included in these Rules for biosolids and sewage sludge applied to the land or placed on a surface disposal site. Also included in these Rules are pathogen and alternative vector attraction reduction requirements for biosolids and sewage sludge applied to the land or placed on a surface disposal site.

Chapter 0400-40-15

JUNE 2013						
SUN	MON	TUE	WED	THU	FRI	SAT
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

Effective Date

June 30, 2013

State Rules
(0400-40-15)

are a mirror image of

Federal Regulations
(40 CFR Part 503)

federal register

Friday
February 19, 1993

Part II

Environmental Protection Agency

40 CFR Part 257 et al.
Standards for the Use or Disposal of Sewage Sludge; Final Rules

40 CFR Part 503

STANDARDS

40 CFR
Part 503

Heavy Metals

Pathogens

Vector
Attraction

Exceptional Quality (EQ) Biosolids

Meets ALL of the Highest Quality 40 CFR Part 503 Standards

EQ Biosolids

equals

Exceptional Quality (EQ) Biosolids Generators

Athens UB

Cookeville

Crossville

Gallatin

Lewisburg

Maryville

Nashville

Newport

Pulaski

Water Authority Dickson County

Biosolids Regulatory Requirements for Tennessee Municipal Utilities

STATE OF TENNESSEE
Department of Environment and Conservation
Division of Water Resources

GENERAL STATE OPERATION PERMIT FOR THE LAND APPLICATION OF NON-EXCEPTIONAL QUALITY BIOSOLIDS

PERMIT NUMBER TNB000000

PERMIT NUMBER TNB000000

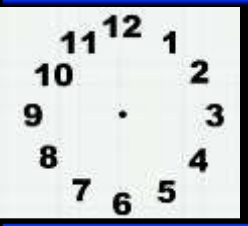
Under authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.), persons covered under this general permit are authorized to land apply non-EQ biosolids in accordance with specific limitations, monitoring requirements, management practices and other conditions set forth herein. Authorization for coverage under this general permit is limited to those facilities and/or operations identified in the notice of intent or separate permit applications that have been accepted in place of a notice of intent.

This permit is issued on: **March 31, 2014**

This permit is effective on: **May 1, 2014**

This permit expires on: **April 30, 2019**

Sandra K. Dudley, Ph.D., P.E.
Director



Biosolids GP - Time Line

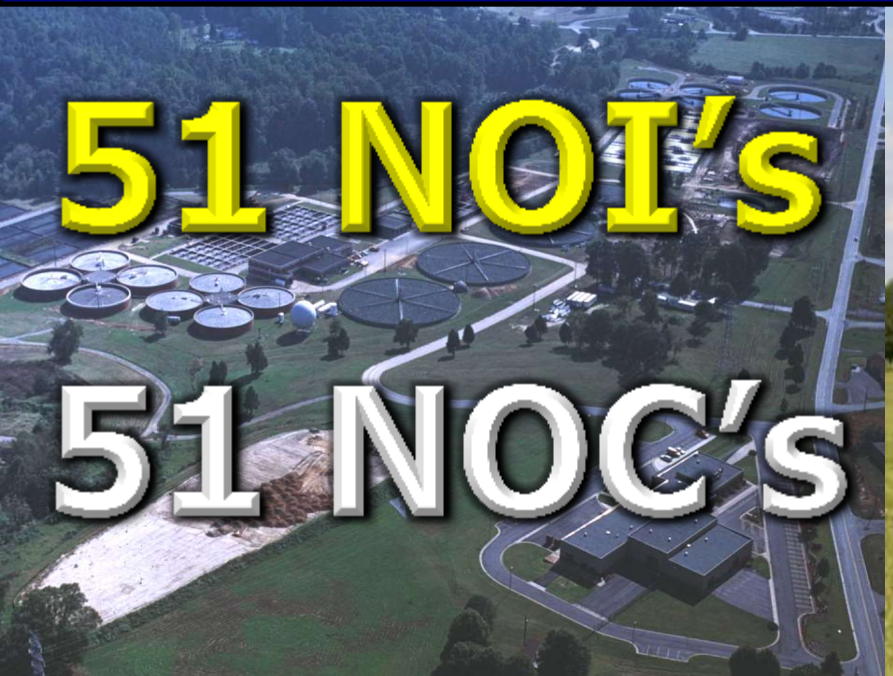
New Sites - Coverage begins 30 days from the time a complete NOI is submitted unless notified by the DWR

NOI
Submitted

+ 30 days

NOC's

WORK IN PROGRESS


51 NOI's
51 NOC's

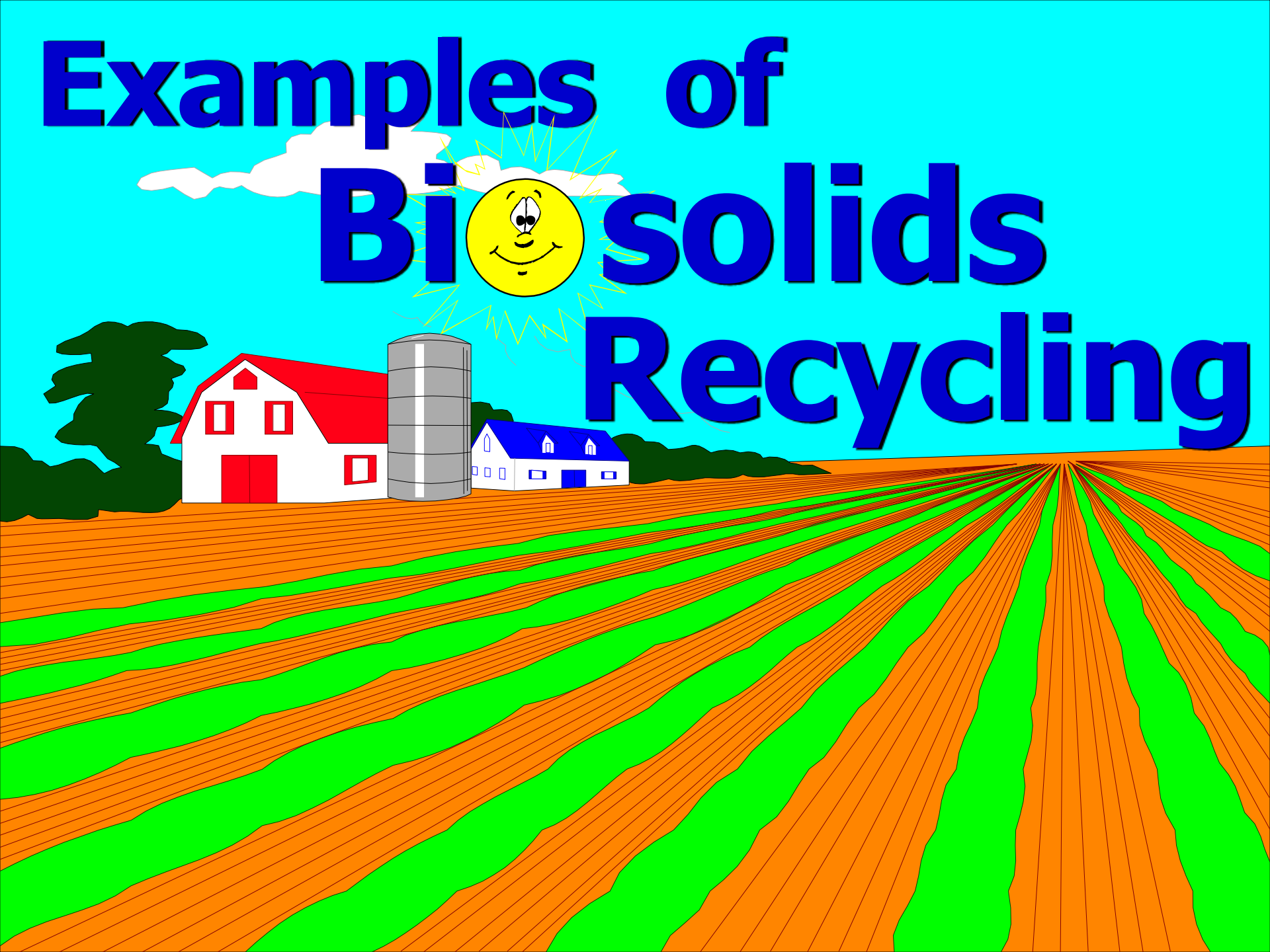
1,789
Land Application Sites
41,841 Acres

Biosolids
Land Application
Beneficial Recycling

Aluminum &
Tin Cans
Assorted Papers
(newspaper, magazines,
office paper, cereal boxes
and other food boxes)
Glass
Styrofoam
Plastics 1-7
Aluminum Foil
(Empty and rinse
containers before
recycling)
Flattened
Cardboard Boxes

~~Ocean Dumping~~
~~Landfill Dumping~~
Recycle

Examples of Biosolids Recycling



PA Strip Mine

PA Strip Mine
after Biosolids application

Vegetation on reclaimed land
5 months after
biosolids application !

A Desert Turned Into
A Land of Turf and Trees

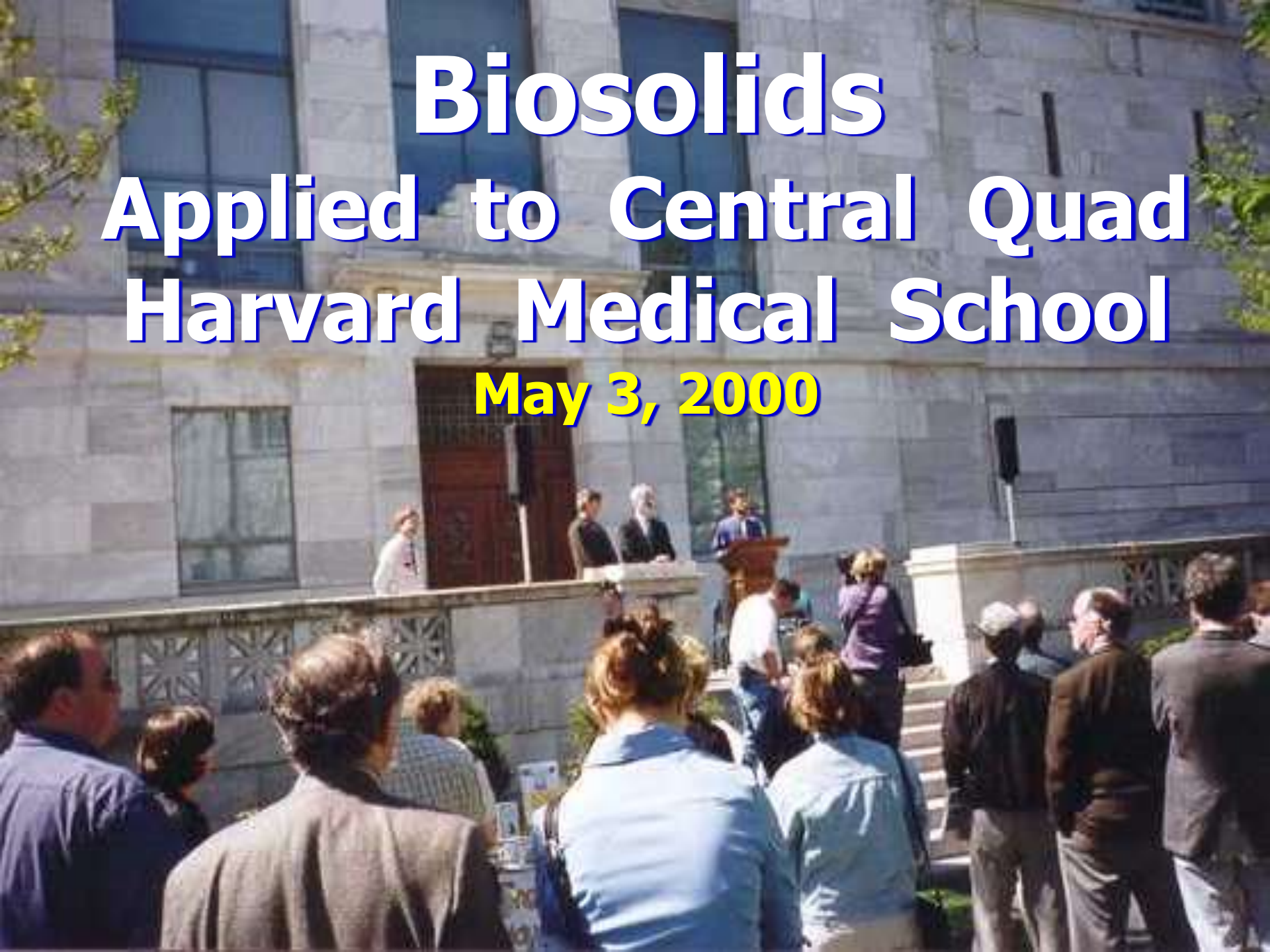
Biosolids

on White House lawn

HARVARD MEDICAL SCHOOL

One of world's preeminent institutions in medical education and research

Biosolids
Applied to Central Quad
Harvard Medical School
May 3, 2000



‘Biosolids’ get 2nd look

Sewage waste will fertilize trees, finance environmental efforts

By Heath Foster
The News Tribune

Call it the evolution of one of mankind's most basic functions.

The waste flushed down the toilets of King County residents has come a long way since the 1970s, when it pumped into Puget Sound.

Today, through a complex treatment process, it is transformed into a nutrient-rich fertilizer as different from human excrement as is the flour derived from a stalk of wheat.

Those end-kernels of sewage treatment, called biosolids, already boost the production of the fruits and grains we eat.

And because of a complex deal finalized last week, it will be used more and more to nourish the trees that fill county open spaces and build homes.

This week, the state Department of Natural Resources, Weyerhaeuser, King County Metro, and an environmental group called the Mountains to Sound Greenway finished an agreement that has been nearly a quarter-century in the making.

The agreement means that in forests of Eastern King County, trees will be growing a good deal faster.

Metro will have a much cheaper way to dispose of some of the 134,500 tons of biosolids its sewage treatment plants in Renton and Seattle produce yearly.

Environmentalists will get the resources needed to heal logging scars along Interstate 90, which connects Seattle to Eastern Washington.

And 2,400 acres of land in the Greenway will be folded into state forests.

"This is the creation of new wealth," said Jim Ellis, a Seattle civic leader who was pivotal in gaining the support of environmental and community groups for the deal. "Sometimes the best ideas are right under our noses."

The idea of spreading treated sewage in forests is not new, and it hasn't always been popular.

The University of Washington, with participation from Metro, developed the use of sewage sludge in the 1970s and 1980s in the Pack Forest in Pierce County, said Peter Machno, manager of Metro's biosolids program.

UW researchers and private companies have found that biosolids have a pretty astounding effect on tree growth. A tree that usually takes 80 years to mature can do so in 39 years with biosolids.

In the late 1980s, Metro tried to import biosolid science to a South King County forest in Cumberland. The public reacted angrily.

The sludge stank. It literally painted the forest black when it was applied, clinging to trees until the next heavy rain. And the small amounts of pathogens and trace metals like mercury, cadmium and lead in it frightened residents. They

Biosolids

Continued from B1

ly noticeable to the eye or nose.

Ellis, president of the Mountains to Sound Greenway, learned two years ago that biosolids had improved and decided it was something the public could trust.

He won the support of influential environmental and community groups – including the Washington Environmental Council, The Mountaineers, and the Sierra Club's Cascade Chapter – for the deal approved by the King County Council June 26.

The three-pronged deal will work like this:

■ Weyerhaeuser has agreed, beginning this year, to increase the amount of biosolids it uses from 5,000 tons a year to 25,000. Over a six-year period, Metro will save $1.4 million by not having to ship the biosolids to Eastern Washington farmers.

About $780,000 of the savings will go the Mountains to Sound Greenway. Greenway members, with help from the county's youth conservation corps, will apply compost to steep slopes and logging clearcuts along the I-90 corridor. About $180,000 will go to UW, whose experts will offer advice and monitor the program. The remaining $57,000 will be returned to Metro rate payers.

■ In a 50-year agreement with the county, the state DNR has agreed to take over 2,371 acres of Metro land valued at $6.5 million. Combined with $5.9 million Metro has in the bank, the bus and sewer agency will have about $12 million of bargaining resources. Machno said purchases or swaps with private companies and the DNR should allow Metro to acquire 2,400 acres in the Greenway. Those lands will then be kept in trust by the DNR.

■ Additionally, the DNR has agreed to let Metro apply biosolids to 3,600 acres of land deep in DNR forests in Eastern King County. About 60 percent of the timber rev-

Dr. Peter Machno

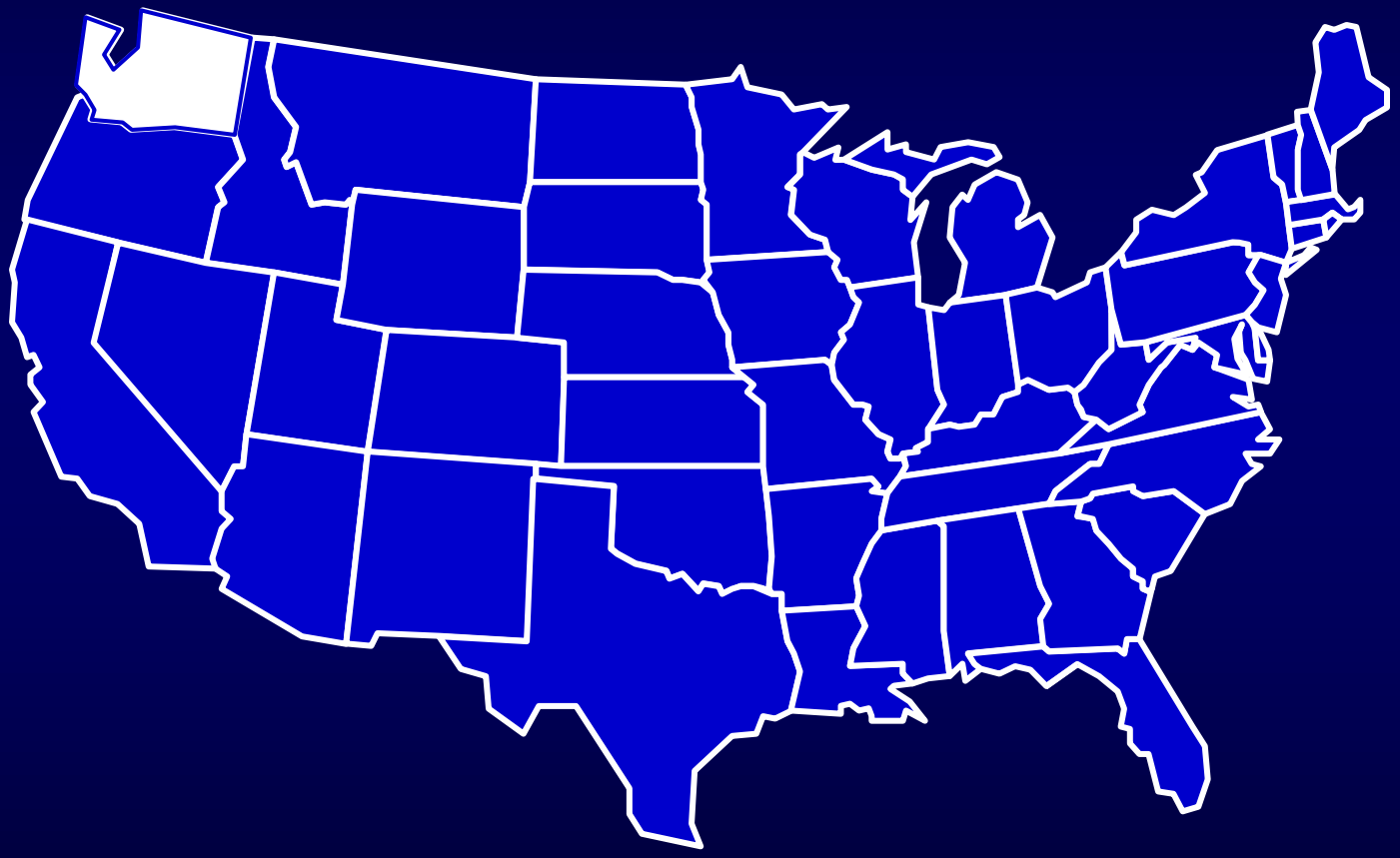
National Biosolids Partnership

formerly with

King County Department of Natural Resources

Seattle, Washington

State of Washington

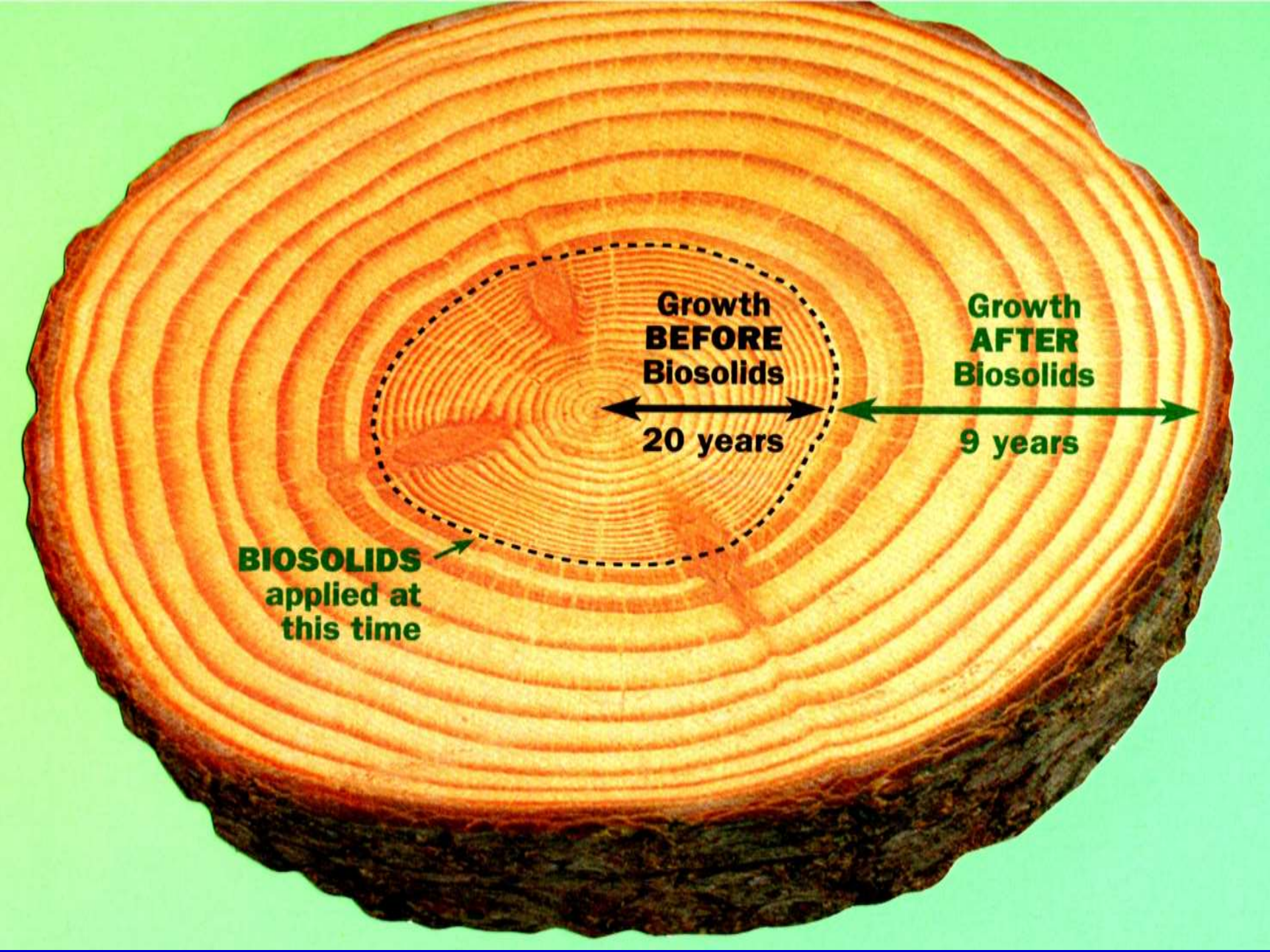


MOUNTAINS
TO·SOUND
GREENWAY

SILVI GROW

with Biosolids

without Biosolids


Growth
BEFORE
Biosolids
20 years
Growth
AFTER
Biosolids
9 years
BIOSOLIDS
applied at
this time

Live Oak Tree in Texas Planted in Biosolids

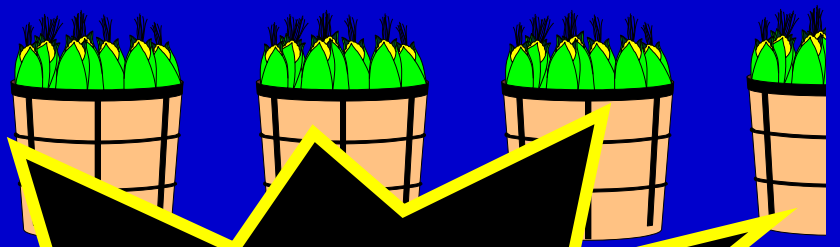
with
Commercial
Fertilizer
with
Biosolids

Corn Yield Comparison

With

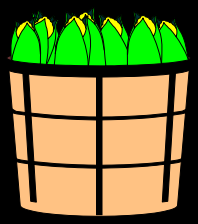
Biosolids

Neuse River
W W T P

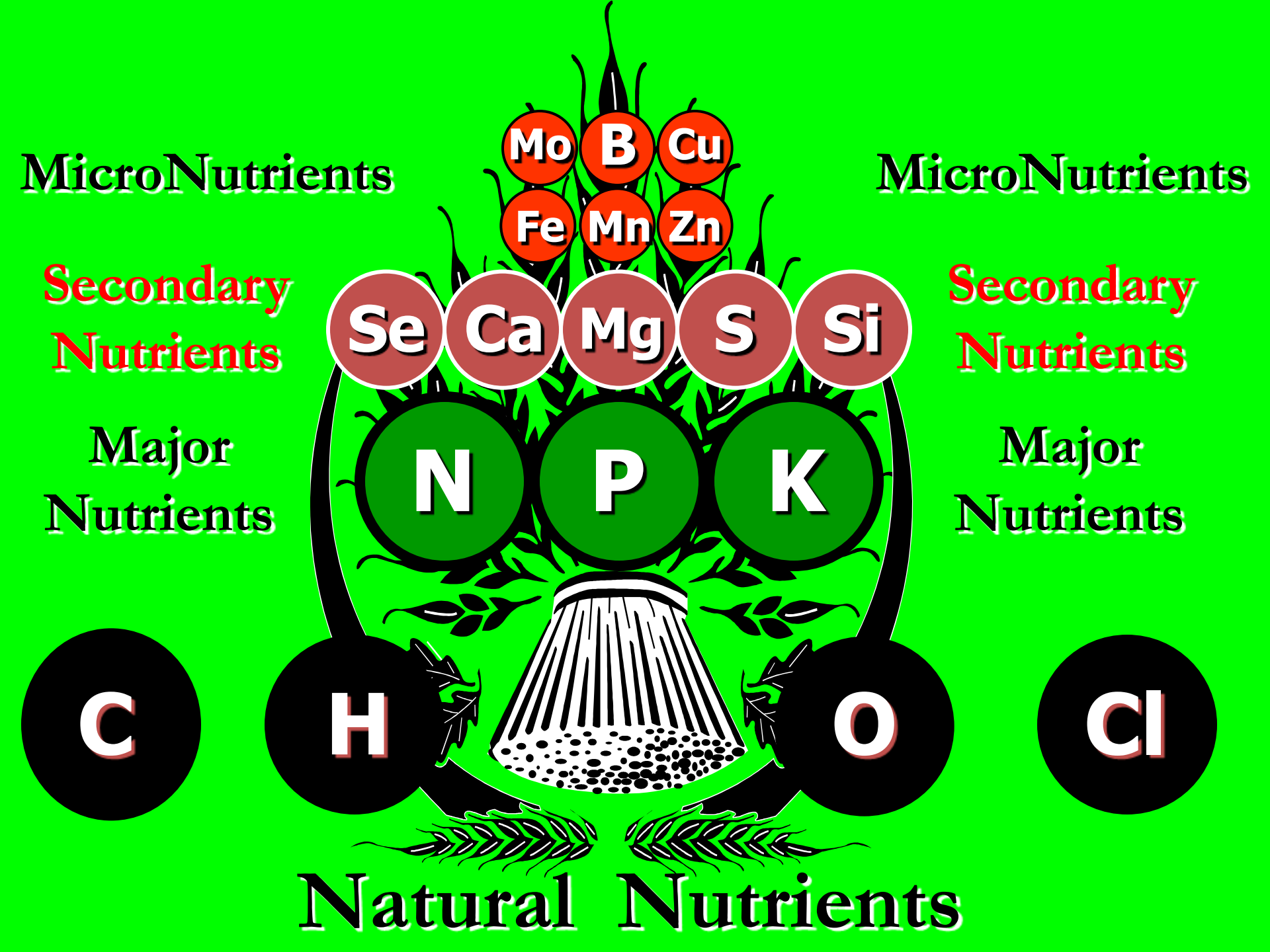


260 Bushels per Acre

North Carolina State Average



82 Bushels per Acre


MicroNutrients
MicroNutrients
Secondary Nutrients
Secondary Nutrients
Major Nutrients
Major Nutrients
Mo
B
Cu
Fe
Mn
Zn
Se
Ca
Mg
S
Si
N
P
K
C
H
O
Cl
Natural Nutrients

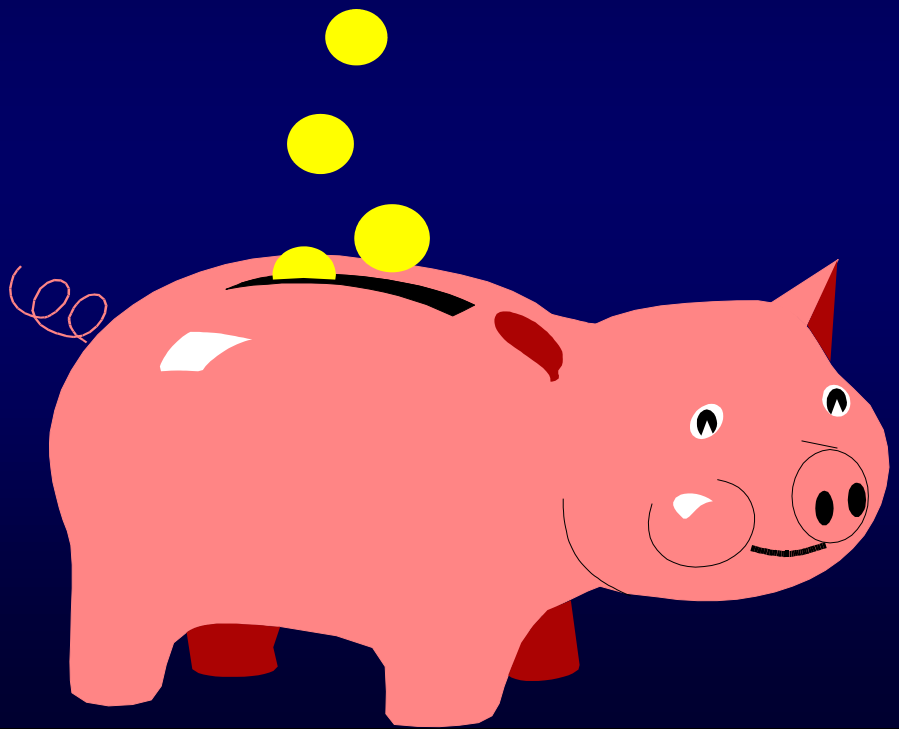
JOHN DEERE

The Case for Biosolids Recycling

Fertilizer Saving$

Increased Crop Yield$

Energy Saving$

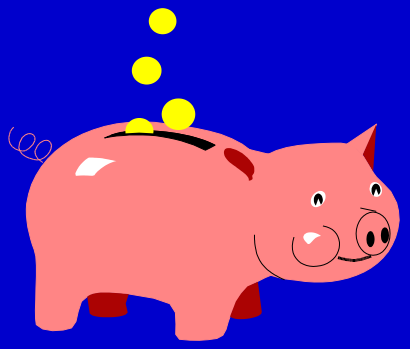


Amount of Biosolids Land Applied in Tennessee (2015)

67,921 Dry Tons

x 120

$8,000,000



N Value

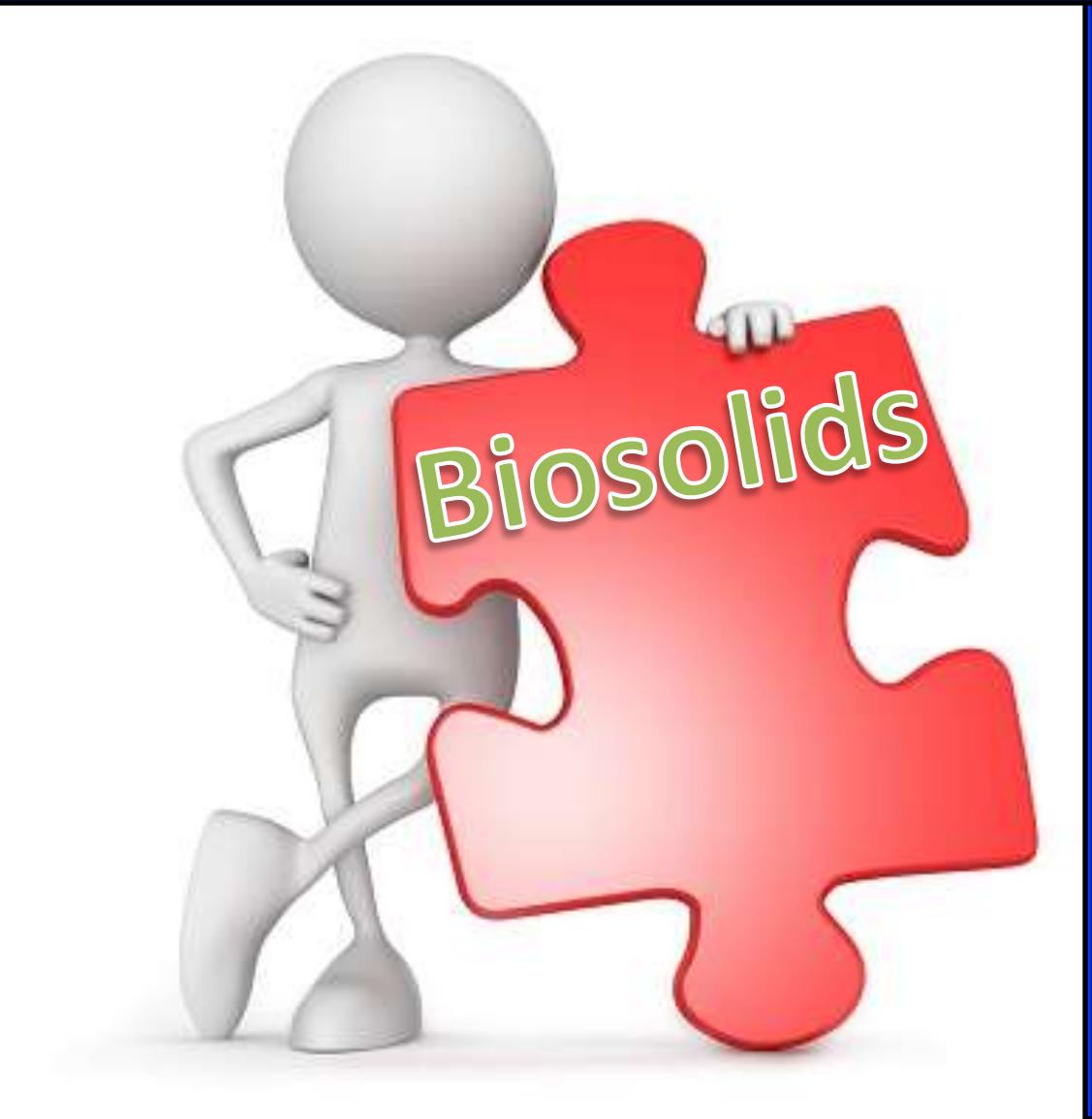
Enough Nitrogen to Fertilize ~300,000 Acres of Wheat

Biosolids Land Application

We regulate one of the largest organic recycling programs in the state.

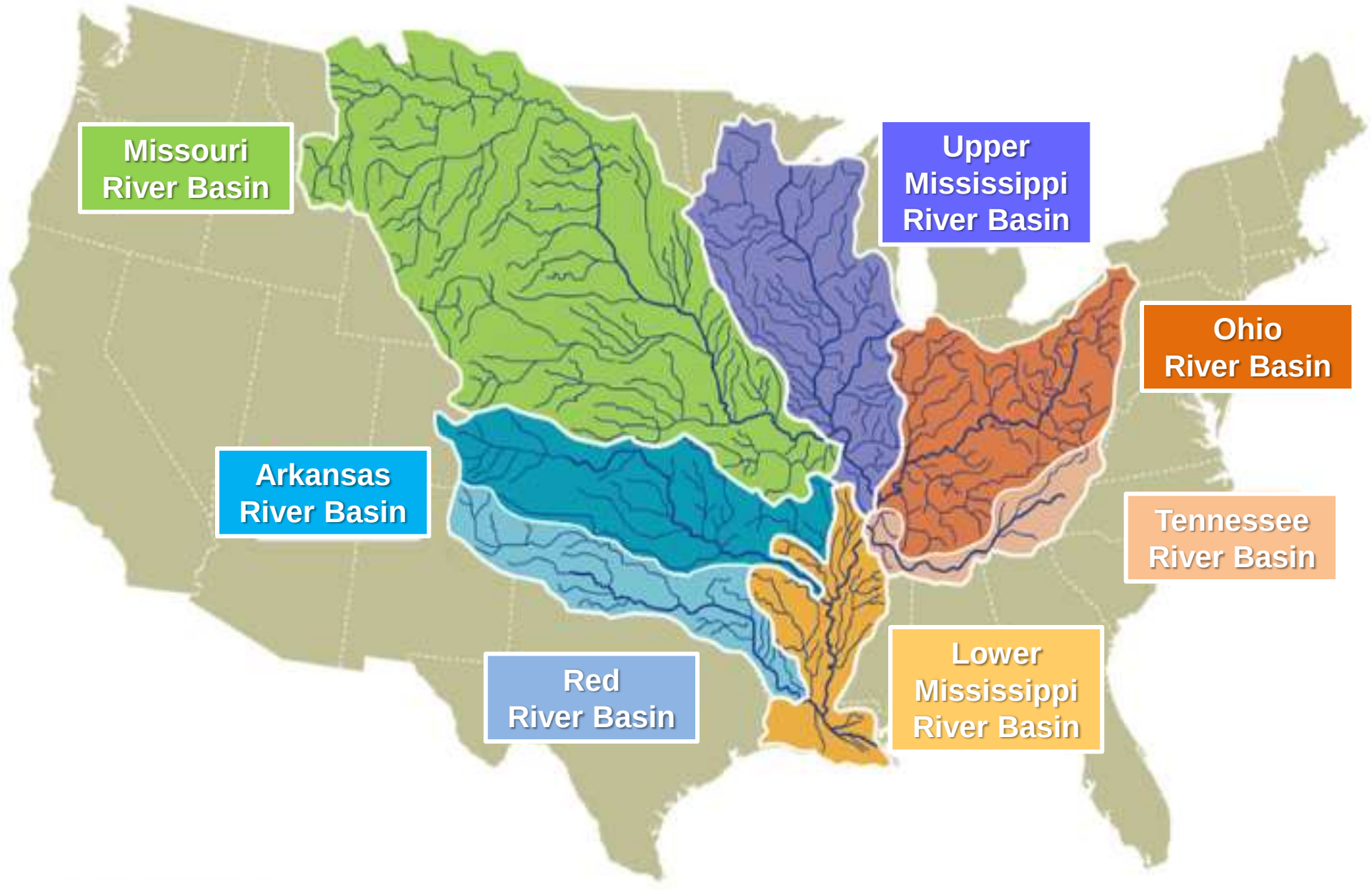
In Conclusion...

Nutrient Reduction Framework



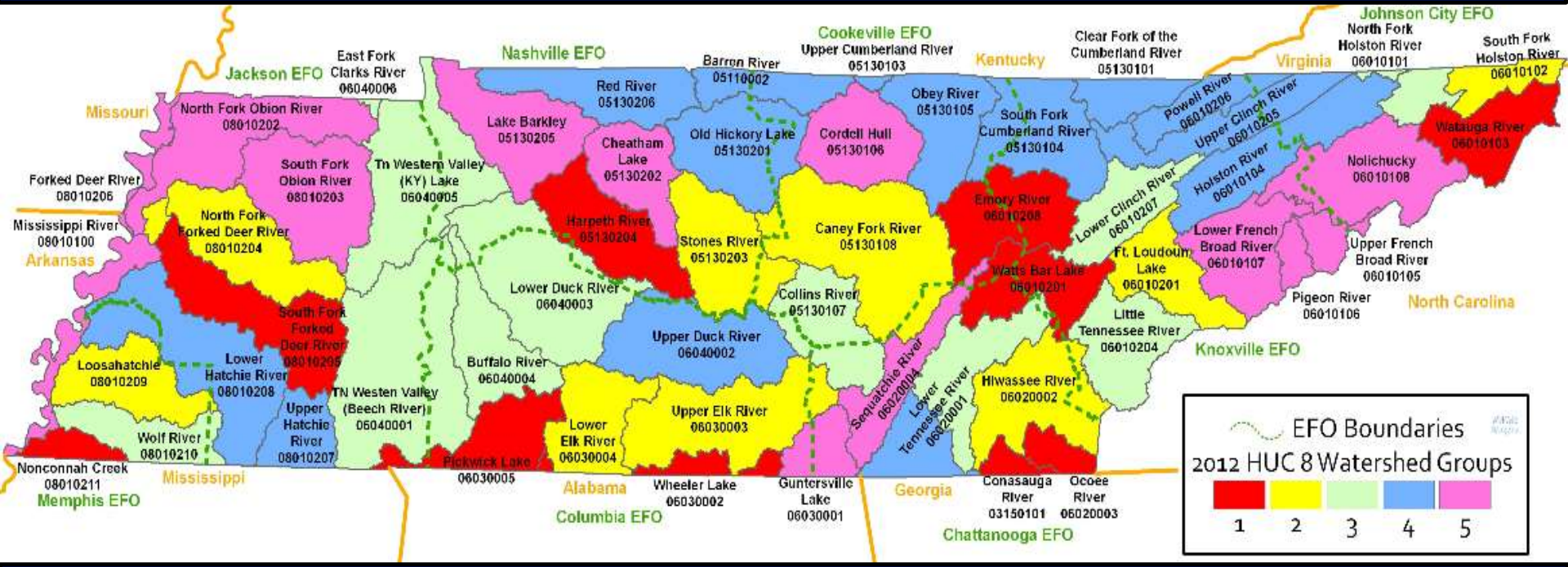
Where do Biosolids Fit in ?

Watershed Protection

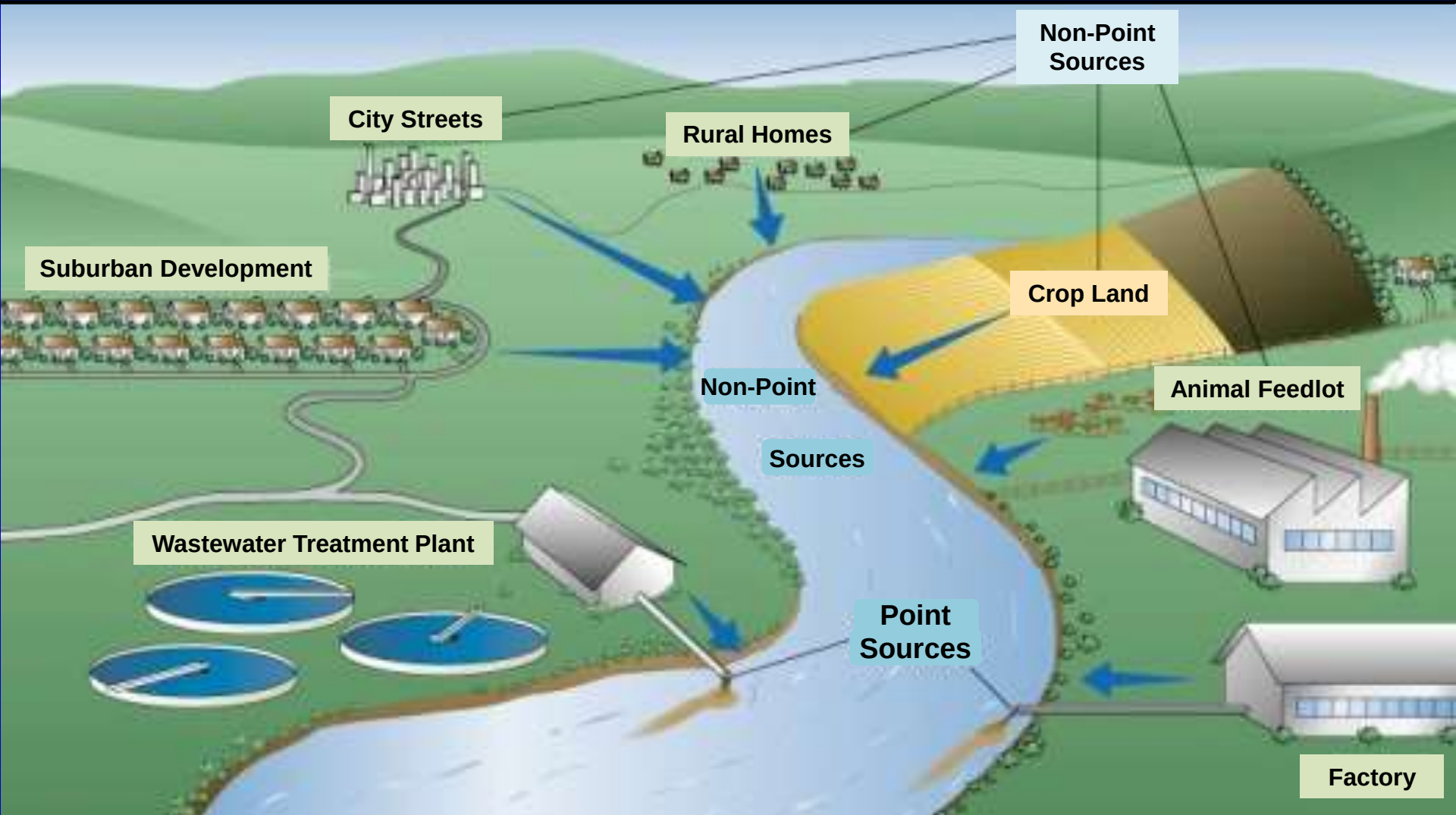


Chesapeake Bay Watershed

Tennessee Watershed Management Groups

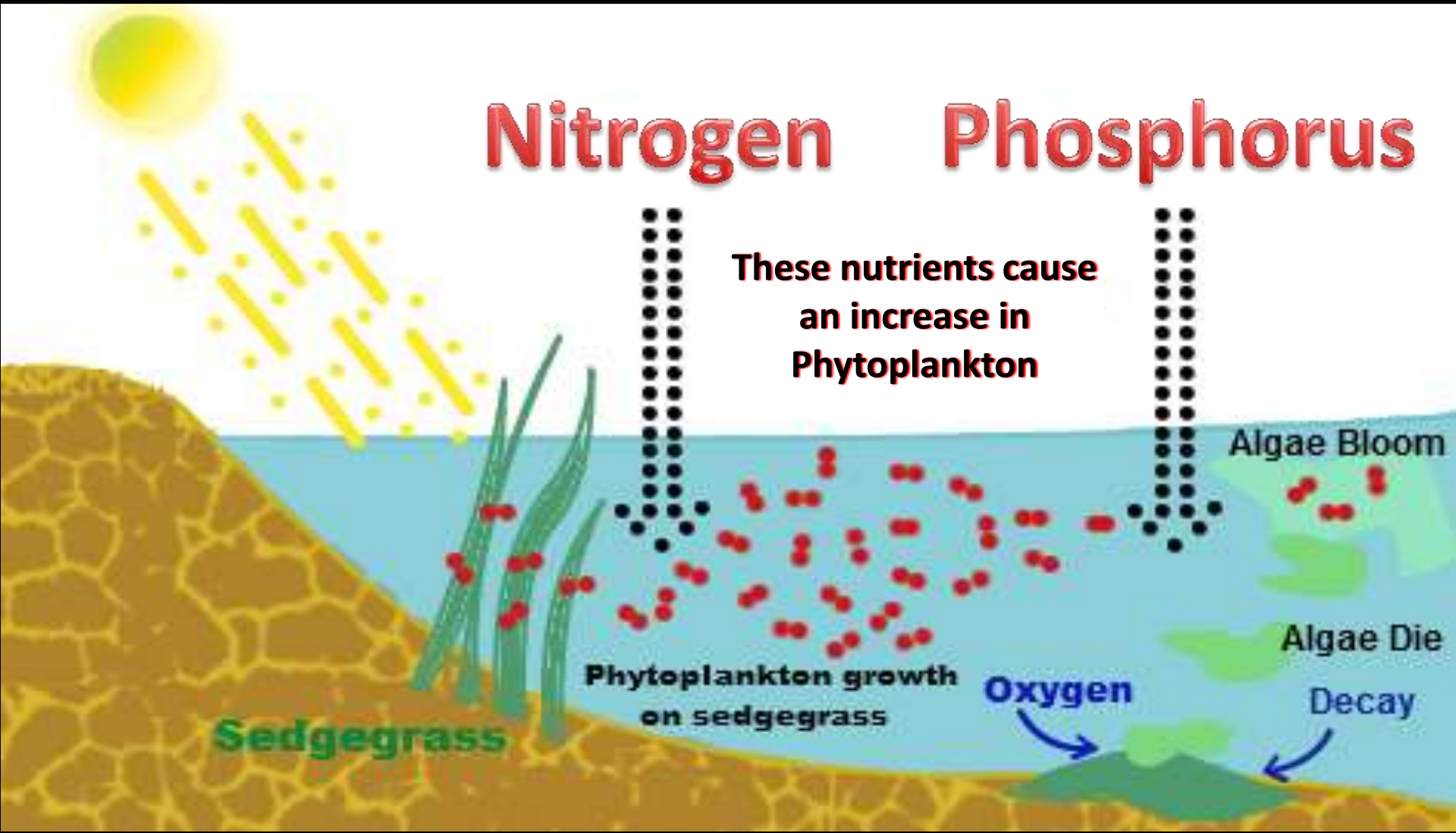


Point and Non-Point Source Discharges



Non-Point Source Pollution

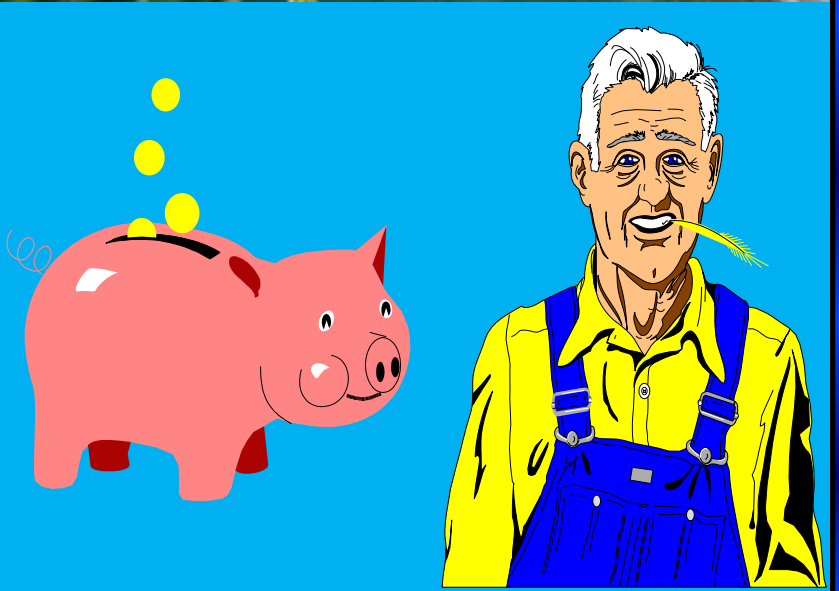
Eutrophication



Biosolids Recycling

Nutrient	Commercial Fertilizer	Animal Manure	Biosolids
N	100% Available as Nitrate	Natural Mineralization to Nitrate	Natural Mineralization to Nitrate
P	100% Available as Phosphate	70% to 90% Available as Phosphate	< 10% Available as Phosphate

Take Home Point



Remember ALL of the Benefits of Biosolids Recycling

Thank You

The End

time for questions

Bob O'Dette

Robert.Odette
@TN.GOV

(615) 253-5319

TN Department of Environment & Conservation