COUNTY HIGHWAY ENVIRONMENTAL COMPLIANCE

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ENVIRONMENTAL COMPLIANCE RESPONSIBILITIES

In the US, more than 39,000 local governments make daily decisions with environmental impact.

Examples:

- Siting Private and Public Development
- Public Infrastructure Planning and Funding
- Drinking Water and Sewer
- Waste Management
- Decisions about Land Use—

  Accommodating population growth and accompanying transportation, housing, workforce and education needs

2

HOW WILL YOUR COMMUNITY GROW?

Costs

Pollution Mitigation

- Cleanup and Development of Brownfields
- Waste Water and Solid Waste

Infrastructure Improvements

- Capital Improvements
- Development and Reuse
- Preparedness

Regulatory Compliance

Needs

Strong Economy

- Workforce and Employment Training
- Good Jobs
- Affordable Places to Live
- Stronger Communities

Cost Effective Government

- Affordable Public Works Services

Challenge to balance needs and costs– both current and future

3

CTAS CAN HELP…WE HELP COUNTIES UNDERSTAND REGULATIONS AND IMPLEMENT PROGRAMS

Departments and Programs:

- Solid Waste Departments
- Highway Departments
- Public Works Departments
- Stormwater Departments
- Planning Departments
- Regional and State Transportation Organizations

4

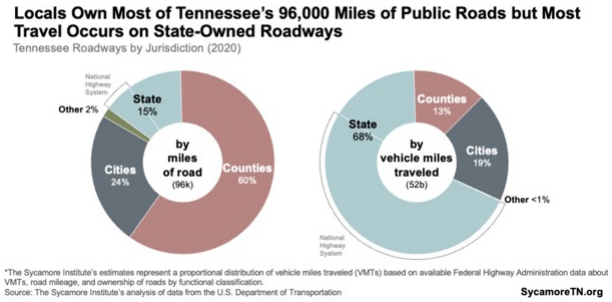
TENNESSEE ROAD STATISTICS

Tennessee has over 96,000 Miles of Roads

- **Counties own 60% of Public Roads**

Tennessee has over 20,000 bridges

- Counties own 48% of the bridges



SycamoreTN.org and https://www.tn.gov/tdot/about/transportation-system-overview.html

5

FEDERAL ACTS WITH REGULATORY AUTHORITY OVER ROAD/BRIDGE CONSTRUCTION AND MAINTENANCE

Siting Regulations/Screening

- National Environmental Policy Act (NEPA)
- Historic and Archeological Preservation

Health Regulations

- Safe Drinking Water Act
- Resource Conservation and Recovery Act (Solid and Hazardous Waste)
- FIFRA (Chemicals—application and disposal)

Land and Water Usage

- **Water Pollution Control Act (Clean Water Act)**
- **National Flood Insurance Act**
- **Endangered Species Act**

6

CLEAN WATER ACT 1972

- Administered by EPA, but day-to-day regulation **mainly carried out by states**
- EPA sets water-quality ratings, a waterbody rated less than Class B is considered "Impaired"
- EPA also establishes water quality standards, such as swimmable and fishable (Class A and B)
- Requires states to list the designated uses of a water body
- In Tennessee, TN Department of Environment and Conservation (TDEC) has this task

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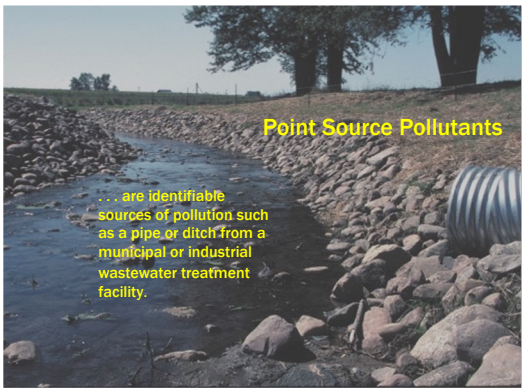
CLEAN WATER ACT ORIGIN

In 1972, most water pollution originated from what was called "**point sources**".

The Act required improvement to sewage treatment plants and issuing of "pollution permits" or NPDES permits (National Pollutant Discharge Elimination System) for industries.

This regulated the source of the discharge.



COUNTY OFFICIALS ORIENTATION PROGRAM 2024

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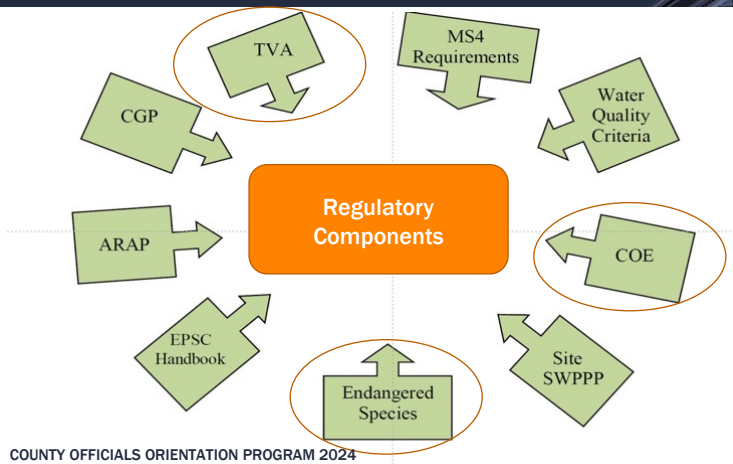
8

WATER POLLUTION CAUSES/SOURCES EXPANDED OVER TIME

Overtime, more focus on the "Cause" of Water Pollution

9

SITE SUITABILITY/FEDERAL CONSTRUCTION SECTIONS



Corp of Engineers, Endangered Species, TVA Shorelines

10

MOST RULES ADMINISTERED BY STATE AGENCIES

> *The Commissioner shall have the power, duty, and responsibility to…post or cause to be posted such signs as required to give notice to the public of the potential or actual dangers of specific uses of such waters.*
> Tennessee Water Quality Control Act

EPA **allows states** to set standards for use other than drinking.

- Must have a plan to maintain water quality
- Protect against the degradation of high-quality waters and water bodies that already meet the fishable/swimmable standards
- Clean up polluted or impaired waterways

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DESIGNATED WATER USE

Highest designation: 'fishable and swimmable'

Most sensitive use takes precedence

Economic and social effects of designating the water body maybe considered

- Drinking water
- Industrial
- Agricultural
- Human Contact
- Swimming
- Fish for eating

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WATER QUALITY

- At least 50 percent of America's waterways are not fit for swimming or fishing.
- Bacteria and sediment are the most common pollutants in rivers and streams.
- Water Pollution comes from Point sources: Stationary and easily identified. "End of pipe"
- Water Pollution also comes from Nonpoint Sources: Dispersed and not in a fixed location. Harder to identify, measure, control.

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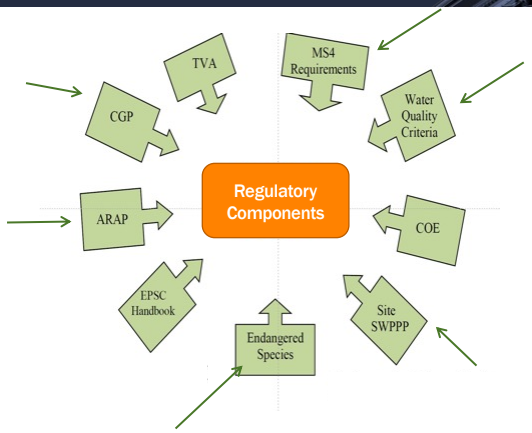
CWA PROGRAMS IMPACTING LOCAL GOVERNMENTS

There are multiple programs within the Clean Water Act

- Section 201—Construction of Public **Sewage Treatment** Plants
- Section 208—Standards and plans for controlling pollution
- Section 303(d)—Allowed ***Total Maximum Daily Loads for pollutants**
- Section 319—**Grants** for control of nonpoint pollution
- Section 402—**Stormwater** and **NPDES** Permits
- Section 404--**Wetlands**



Most areas of concern for Highway Departments are related to "discharge" and Erosion and Sediment Control

Regulatory Agencies-TDEC, TVA, Corps of Engineers, Dept of Agriculture, MS4's

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STORMWATER RUNOFF—NONPOINT "DISCHARGE"

Between 70-80 percent of water pollution comes from nonpoint sources.

Examples:

Agricultural practices	Forestry practices	Road building and construction	Runoff from impervious services	Onsite septic systems	Lawns and golf courses	Motor vehicles	Mines

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NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)--PERMITS FOR STORMWATER DISCHARGE

Phase I of this federal program was implemented in 1990.

Phase I used a permit system to **regulate storm water discharges from larger cities** and construction projects.

In 2000, TDEC expanded Phase I by requiring counties, cities, and additional other parties to implement programs and practices to **control stormwater runoff (Phase II).**

This primarily **applies to the ~20 larger counties and cities within**. If you are named, you need a Permit and Plan.

The MS4 Permit as it's known, effectively creates a local utility to manage stormwater and the impacts of land clearing.

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MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4'S)

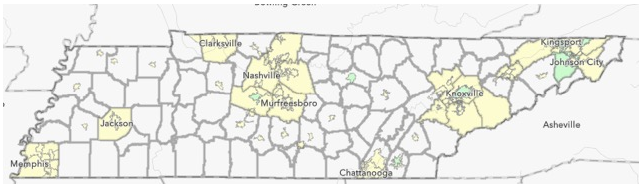
Modern systems are Separate, meaning Sewage is collected separate from Stormwater.

Areas covered by SSS's often have a municipal separate storm sewer system (MS4) to collect and convey runoff from rainfall.

The stormwater is typically untreated and directed back to waterways. Nationwide, there are almost 16,000 systems.

MS4 operators must obtain a NPDES permit.

CSO's and SSO's are permitted as point sources of water pollution.



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WHO NEEDS AN NPDES STORMWATER CONSTRUCTION PERMIT?

Operators of construction sites involving clearing, grading or excavation that result in an area of disturbance of one or more acres, and activities that result in the disturbance of less than one acre if it is part of a larger common plan of development or sale.

Permitted activities have included housing subdivisions, commercial and industrial buildings, golf courses, utility lines, sewage treatment plants, and roads. Various land clearing activities such as borrow pits for fill material have also been covered under this general permit.

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STORMWATER POLLUTION PREVENTION PLAN (SWPPP) COVERAGE

Your local MS4 (Stormwater Program) likely has the authority to inspect your facility as part of their permit requirement.

Under this coverage, Highway Departments will need to obtain and follow the terms of a SWPP plan.

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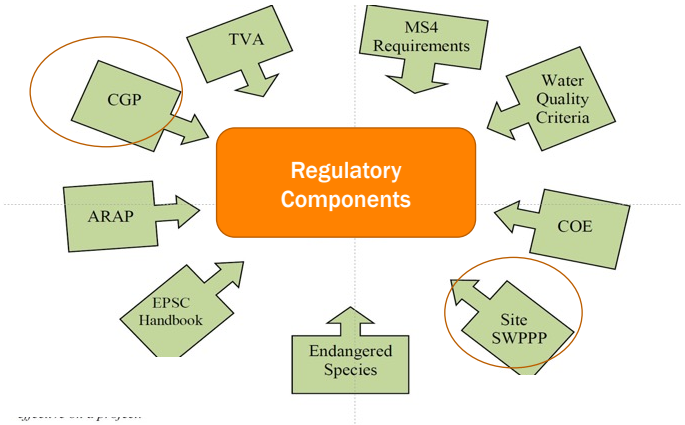
CONSTRUCTION GENERAL PERMIT AND SITE SWPPP



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NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT (CGP)

NPDES permits are required by the U.S. Environmental Protection Agency, but are administered within this state by TDEC, or by a Qualified Local Program (QLP).

A construction permit is necessary for all construction activity that involves the grubbing, clearing, grading or excavation of 1 acre or more.

Even if the construction activity is less than 1 acre, a NPDES construction permit is still required if the overall project development site includes over 1 acre.

The applicant must fill out a Notice of Intent (NOI) form and also submit a Stormwater Pollution Prevention Plan (SWPPP). Application fees typically range from $250 up to $7500, depending on the amount of acreage developed.

Two options for obtaining authorization to discharge or "permit coverage": general permits and individual permits.

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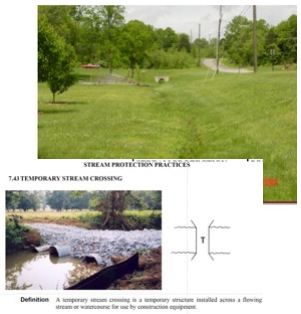
CLEAN WATER ACT SECTION: NPDES COVERAGE FOR COUNTY PUBLIC WORKS PROGRAMS

Construction, Conveyances, and Stream Alteration

To obtain authorization to discharge under a construction general permit, a discharger submits to the permitting authority a **Notice of Intent** (NOI) to be covered under the general permit.

An NOI is **not a permit** or a permit application, but by submitting the NOI, the discharger acknowledges that it is **eligible for coverage** under the general permit and that it **agrees to the conditions** in the published general permit.

Discharges associated with the construction activity are **authorized consistent with the terms** and conditions established in the general permit.



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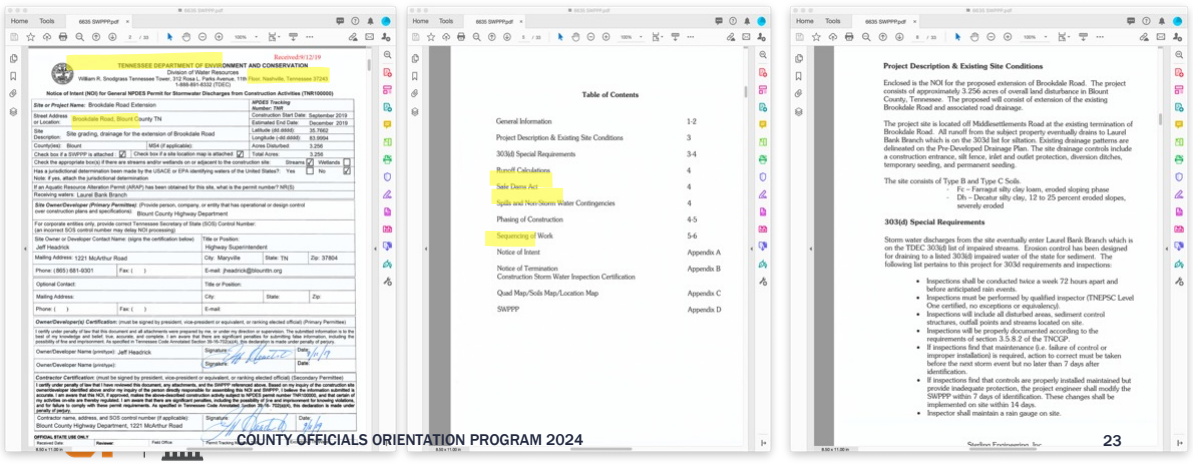
CONSTRUCTION GENERAL PERMIT WITH "SWPPP"



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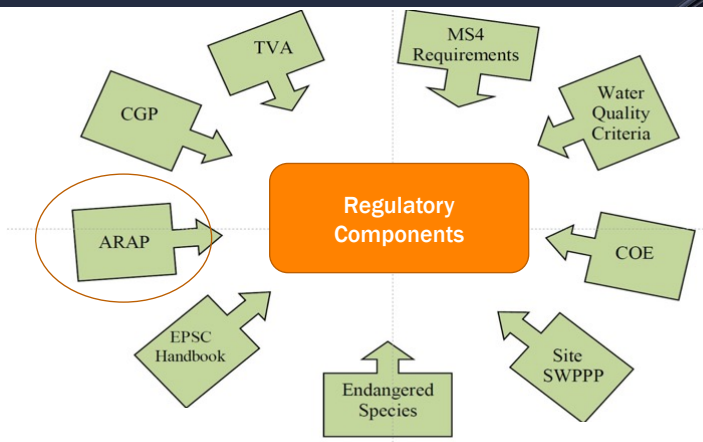
STREAM ALTERATION PERMIT-ARAP



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AQUATIC RESOURCE ALTERATION PERMIT (ARAP)

This permit is necessary for any alteration, modification or impact within or adjacent to waters of the state, which also includes wetlands and sinkholes.

Waters of the state are normally defined as any blue-line stream shown on a USGS quadrangle map, or any point adjacent or downstream from the start of a blue-line stream shown on a USGS quadrangle map.

State of Tennessee requires that an ARAP must be submitted and approved prior to any activity which could potentially damage or degrade waters of the state.

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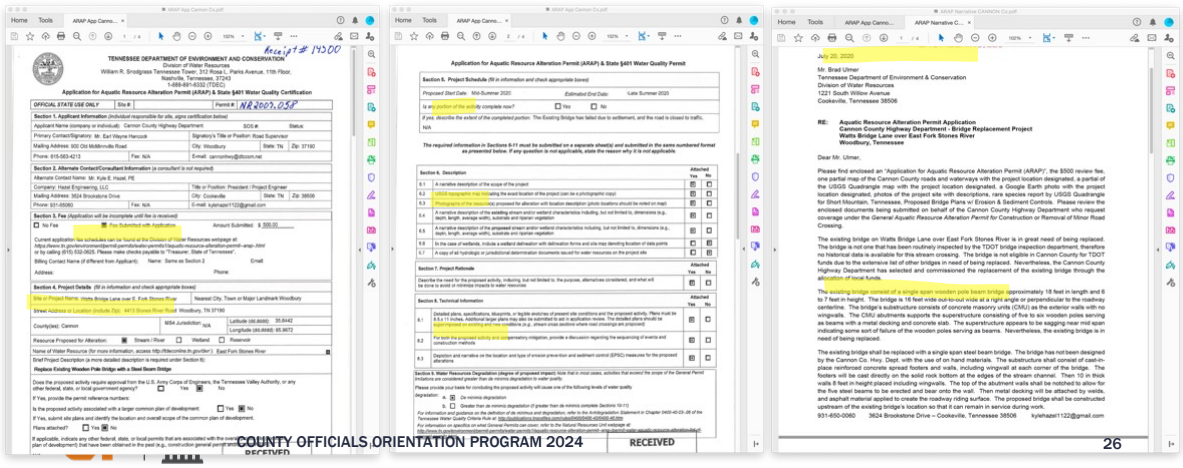
APPLICATION FOR "ARAP" PERMIT



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WATER PERMIT (ARAP) FOR THE ALTERATION OF WET WEATHER CONVEYANCES

Conveyances: "Man-made or natural watercourses, including natural watercourses that have been modified by channelization, that flow only in direct response to precipitation runoff in their immediate locality, whose channels are above the groundwater table, and in which hydrological and biological analysis indicate that, under normal weather conditions, …there is not sufficient water to support fish, or…organisms whose life cycle includes an aquatic phase of at least two months."

TDEC-WPC Hydrological Determination Guidance

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ALTERATIONS OF WET WEATHER CONVEYANCES

Alterations to wet weather conveyances do not require submittal of an application or written authorization prior to commencement of work provided the alteration is performed in accordance with the terms and conditions:

The fine print!

1) No **discharge** of waste
2) Placement of materials will not impair surface water
3) **Sediment** shall be prevented from entering waters of the state
4) Erosion and sediment **control measures** shall be designed according to the size and slope of the disturbed drainage area
5) Erosion and sediment control measures shall be **in place** and functional before operations begin
6) Check dams utilized where runoff is concentrated
7) Appropriate steps taken to ensure **petroleum products** or other chemicals are prevented from entering waters of the state.
8) Work shall not commence until the permittee has obtained all necessary authorizations
9) Permit does not authorize impacts to cultural, historic or archeologic features or sites.
10) Permit does not authorize access to private property.
11) Permit does not authorize adverse impact to formally listed state or federal threatened endangered species or their critical habitat.
12) The permittee is responsible for obtaining coverage under NPDES General Permit for Storm Water Discharges from Construction Activities where clearing, grading or excavation results in an area of disturbance of one or more acres, or activities that result in the disturbance of less than one acre if it is part of a larger common plan of development or sale.

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WATER PERMIT (ARAP) FOR CONSTRUCTION OR REMOVAL OF MINOR ROAD CROSSINGS

Coverage: This general permit authorizes the construction and/or removal of minor road crossings of streams, via bridge, culvert, pipe, or fords.

This permit also authorizes other similar transportation crossings such as railroads and linear crossings of greenway trails.

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"SPECIAL CONDITIONS"

1) Road crossings, including transition channels, endwalls, aprons, or rip rap, that either individually or cumulatively exceed a total length of 200 feet of impact in the same water body are not covered.

2) Non-linear crossings such as vehicle maintenance or storage building, parking lots, cul-de-sacs and turn arounds are not covered.

3) Riprap areas must mimic the existing/proposed contours of the stream channel

4) Road crossing that may significantly alter the hydraulics of the stream (under-sizing or over widening) not covered.

5) Bottom of culverts shall be constructed below the stream bed elevation.

6) The crossing shall be culverted, bridged or otherwise designed to prevent the impoundment of normal or base flows on the upstream side, and not result in a disruption or barrier to the movement of fish or other aquatic life.

7) The Width of the fill shall be limited to the minimum necessary for the crossing.

8) Where a crossing is removed, natural channel characteristics shall be replicated and stabilized using clean rock, riprap anchored trees or other non-erodible materials.

Read the fine print!

30

GENERAL AQUATIC RESOURCE ALTERATION PERMIT FOR MAINTENANCE ACTIVITIES

This general permit authorizes the maintenance of existing, currently serviceable structures or fills, such as dams, intake and outfall structures, utilities, culverts, and bridges in waters of the state. “

Currently serviceable" means useable as is or with some maintenance, but-not so degraded as to essentially require reconstruction.

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“SPECIAL CONDITIONS”

- The length of the pipe or culvert structure may not be increased.
- The capacity or diameter of the pipe or culvert may be increased during replacement, providing it does not result in channel widening or other channel destabilization.
- Increasing dam height, resulting in increased impoundment footprint or change in downstream water quality is not covered.
- Dewatering of impoundments to conduct dam maintenance must be performed in a controlled manner designed to minimize the release of accumulated sediments into downstream waters.

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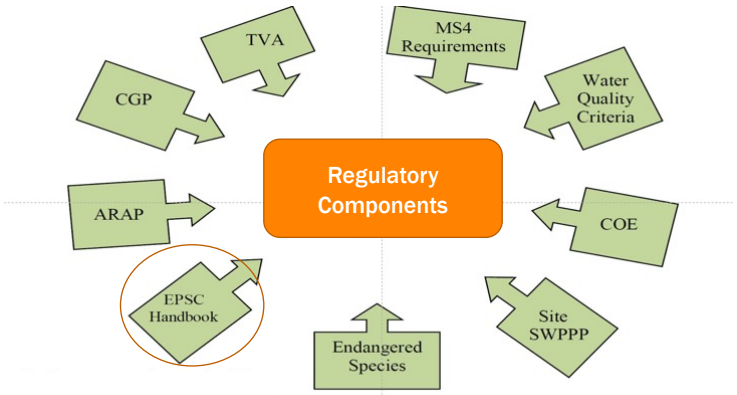
SEDIMENT AND EROSION CONTROL



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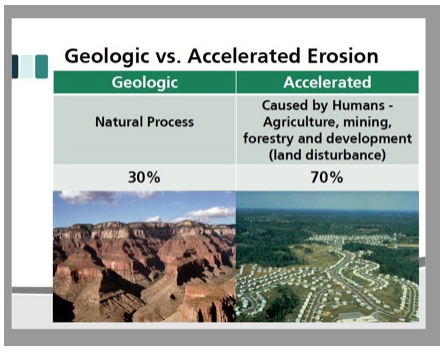
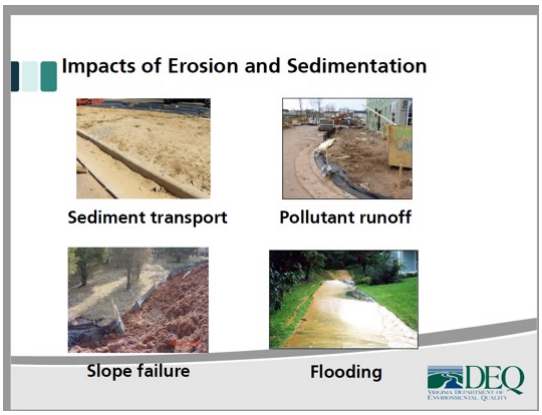
EROSION PROCESSES





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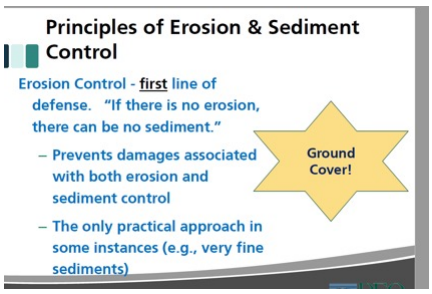
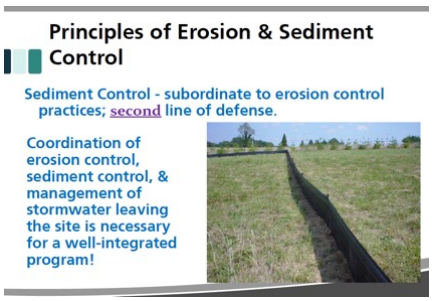
CONTROL MEASURES





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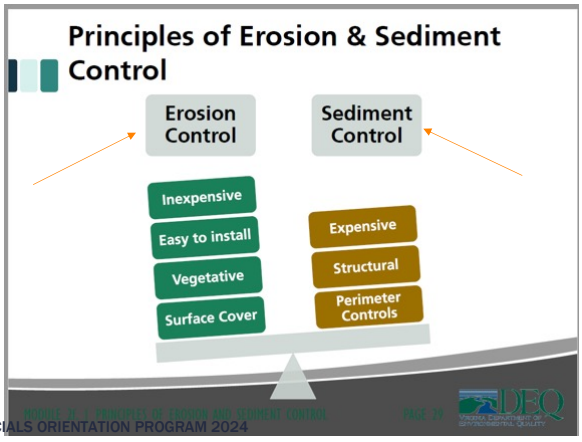
PAY NOW OR PAY LATER?



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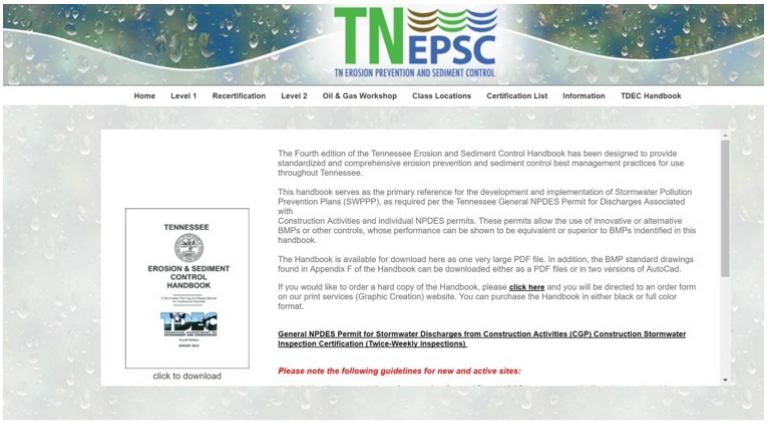
TN EROSION PREVENTION AND SEDIMENT CONTROL PROGRAM

https://tnepsc.org/handbook.asp



Training for Workers who are engaged in Dirt Moving or Construction Activities

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BEST MANAGEMENT PRACTICES (BMP'S)

STREAM PROTECTION PRACTICES		POLLUTION PREVENTION PRACTICES	
STREAM BUFFER DO NOT DISTURB	7.41 Stream Buffers	CONCRETE WASHOUT	7.16 Concrete washout
	Stream Diversion Channel	VEHICLE MAINTENANCE	7.17 Vehicle maintenance
T	7.43 Temporary Stream Crossing	CHEMICAL STORAGE	7.18 Chemical storage
S	7.44 Bioengineered Stream Bank Stabilization	DEBRIS MANAGEMENT	7.19 Trash and debris

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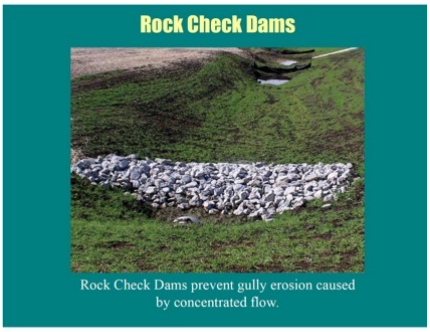
BEST MANAGEMENT PRACTICES (BMP'S)



RUNOFF CONTROL PRACTICES	
	7.20 Check Dam
	7.21 Dewatering Treatment Practice
	7.23 Outlet Protection

	7.24 Slope Drain
	7.25 Tubes and Wattles
	7.26 Level Spreader
	7.27 Channels

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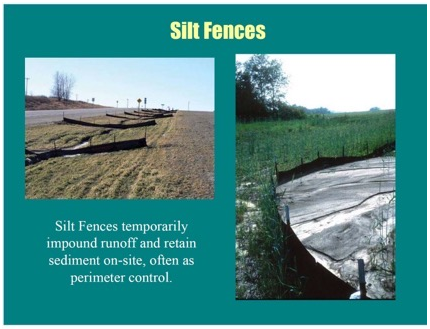
Best Management Practices (BMP's)



SEDIMENT CONTROL PRACTICES
7.28 Construction Exit
7.29 Tire washing facility
7.30 Filter Ring
7.31 Sediment Basin
7.32 Sediment Trap
7.33 Baffles
7.34 Silt Fence
7.35 Inlet Protection

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SUMMARY: HOW COUNTIES IMPLEMENT WATER QUALITY STANDARDS

Through **MS4's and Stormwater** Ordinances

Through **Zoning and Zoning Overlays**: local requirements for development to locate away from high-quality water bodies, impaired waterways, or wellhead protection areas.

- Restrictions on steep slopes, away from septic drain locations, utilization of setbacks and other siting criteria.

Through **Subdivision Regulations**: During and Post Construction Developers are required to have Stormwater management and Erosion and Sediment Controls.

Through **Public Works Best Practices**: Erosion Control and Pollution Prevention Measures, SWPPP, ARAP

Through **Development Permitting**: Required Construction and Post Construction Practices (CGP)

Through **Rural County Conservation Districts** and Natural Resources Conservation Service (NRCS): Best Management Practices ("BMP's") for Agriculture

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USING UAV'S (DRONES) IN PUBLIC WORKS APPLICATIONS

Unmanned aerial vehicles (UAVs) can survey and measure and provide detailed visual insight including

- Topographic maps
- Orthomosaic maps
- Corridor maps
- Earthwork surveys

Earthwork surveys can measure cut and fill and stockpiles

Can aid in planning for vegetation, debris, or other obstruction clearing

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BENEFITS--IMPROVED DECISION MAKING

- Faster Data Collection
- Real-time Site Monitoring
- Historical Project Review
- Legal and Safety Documentation
- Improved Worker and Site Safety

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USE CASES

ACCURATE AND COMPREHENSIVE DATA

COST AND TIME-SAVING

MAINTENANCE AND ASSET INSPECTION

POST PROJECT DOCUMENTATION

HIGHWAY INFRASTRUCTURE MANAGEMENT

BRIDGE INSPECTION

PAVEMENT CONDITIONS AND ROAD DISTRESS MONITORING

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FLY
UPLOAD
EXPLORE
REPORT
Start
Flight Planning Tool. This is the flight plan for the lower section. Mapping 15 acres. The image resolution is estimated to be .5 in/pixel with flight mapped from 200 ft.
AUGUST 2024
COUNTY OFFICIALS ORIENTATION PROGRAM 2024
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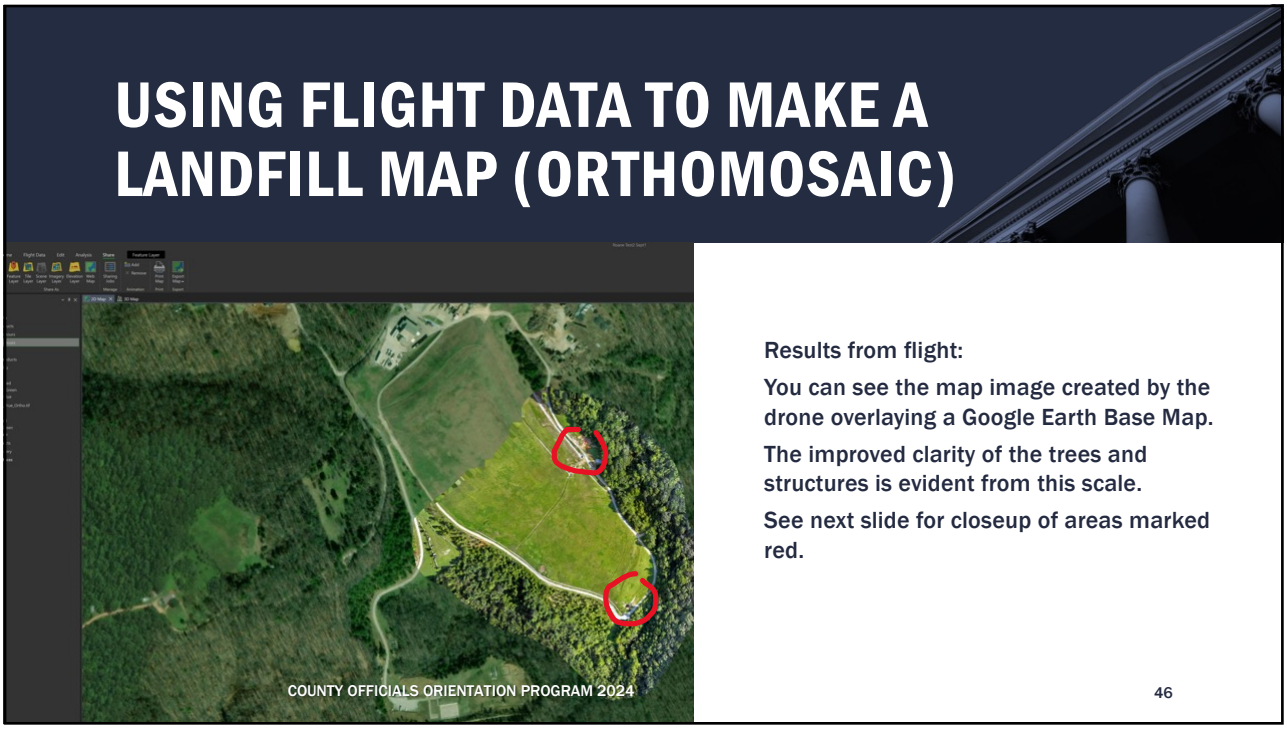
USING FLIGHT DATA TO MAKE A LANDFILL MAP (ORTHOMOSAIC)
COUNTY OFFICIALS ORIENTATION PROGRAM 2024
Results from flight:
You can see the map image created by the drone overlaying a Google Earth Base Map.
The improved clarity of the trees and structures is evident from this scale.
See next slide for closeup of areas marked red.
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THESE IMAGES ARE TAKEN FROM 200 FT ABOVE GROUND IN FLIGHT PATH WHILE THE DRONE IS MOVING AS FAST AS 31 MPH.

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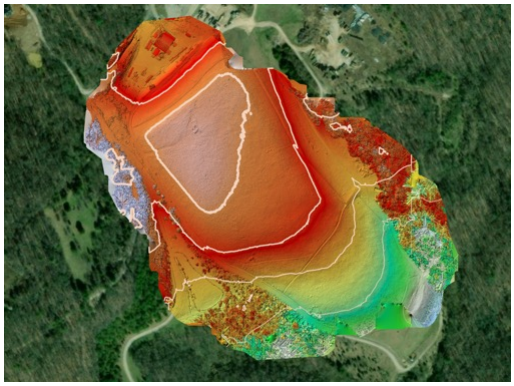
POST PROCESS-ELEVATION MODEL (DEM)



Other Options:

- Digital Surface Models
- Digital Terrain Models
- Videos
- 3D MODELS
- (Mesh)Thermal Imaging

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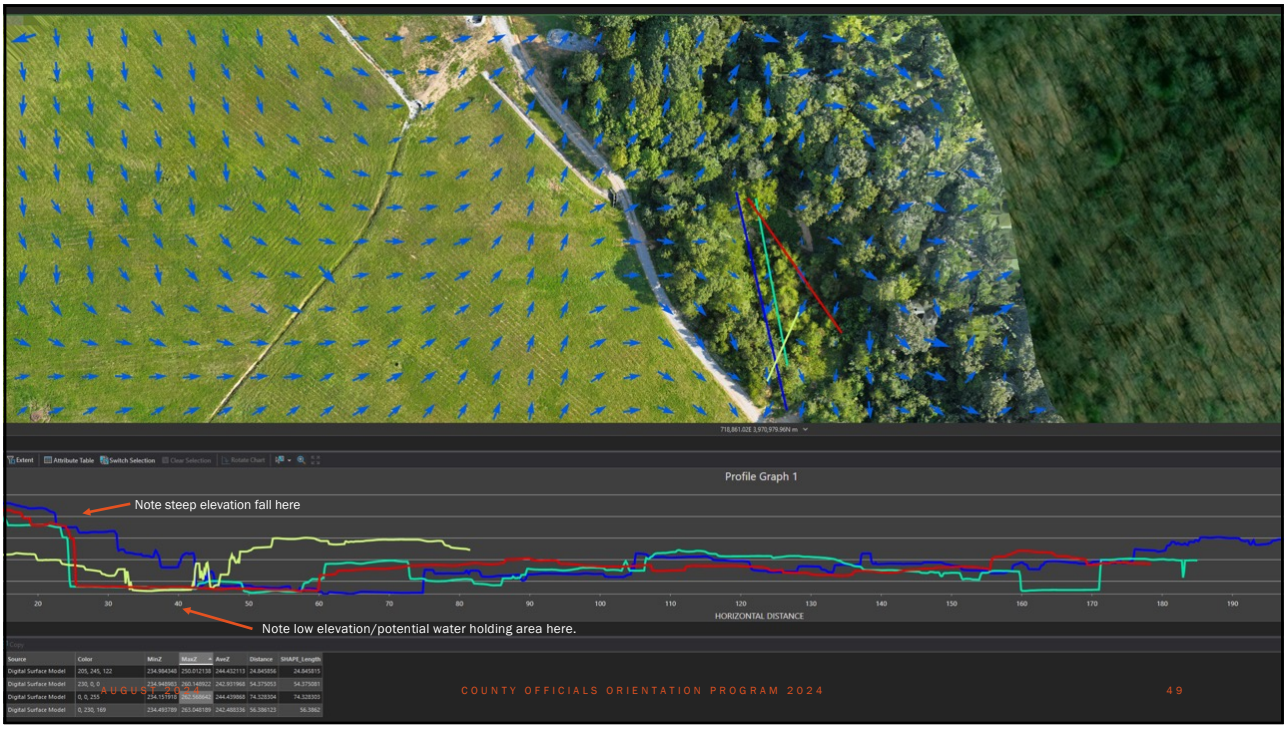
Profile Graph 1
Note steep elevation fall here
Note low elevation/potential water holding area here.
HORIZONTAL DISTANCE
COUNTY OFFICIALS ORIENTATION PROGRAM 2024
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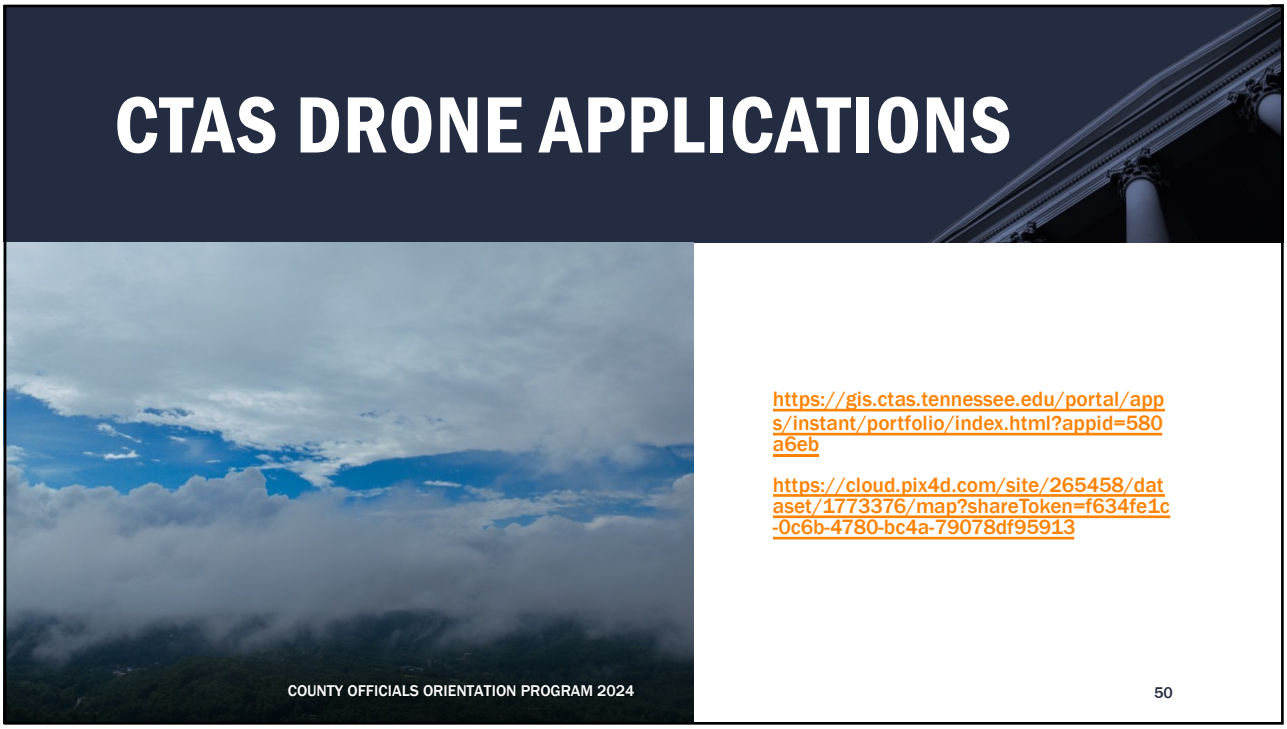
CTAS DRONE APPLICATIONS
https://gis.ctas.tennessee.edu/portal/apps/instant/portfolio/index.html?appid=580a6eb
https://cloud.pix4d.com/site/265458/dataset/1773376/map?shareToken=f634fe1c-0c6b-4780-bc4a-79078df95913
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CONGRATULATIONS ON YOUR ELECTION!

We are here for you.

How can we help?

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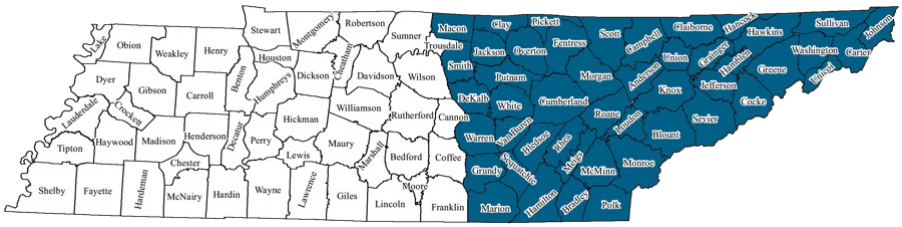
ENVIRONMENTAL SERVICES



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