Land-Based Treatment

An Innovative Approach to Waste Management

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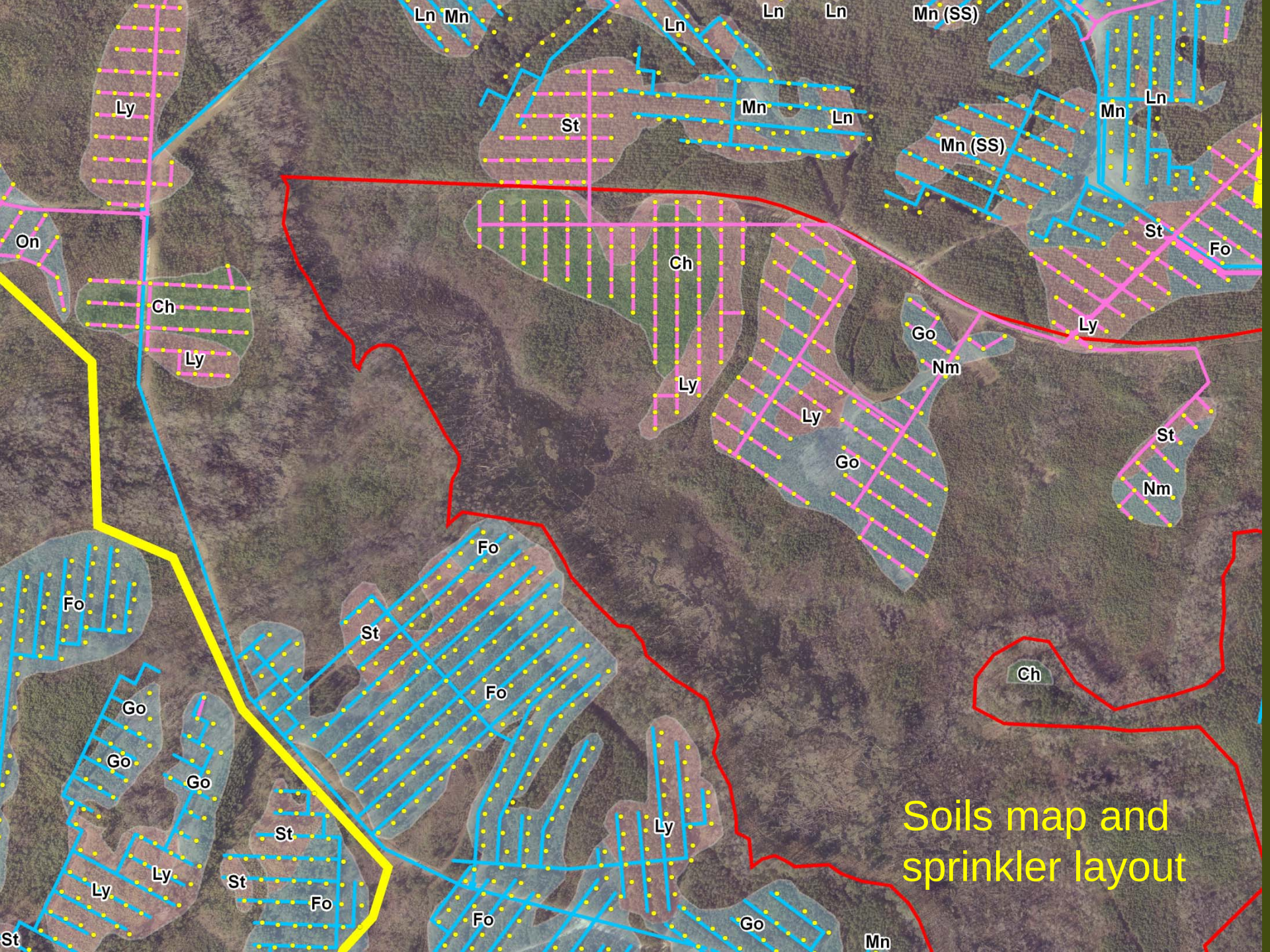
Is it Really Innovative?

- Practiced for over 300 years
- Replaced by new technology in late 1800s (new concrete and steel technology)
- ‘Rediscovered’ in 1970s
- Proven – uses natural ecosystem processes
- Soil and vegetation achieves better the same biological and chemical processes
- Can be cheaper on a net present value basis (capital and operating costs)

A Living Filter



Soils map and sprinkler layout

Irrigated 1,000 ha Watershed and Drinking Water Recycling

Why Land Apply Effluent

- Resource recovery
  - Recharge ground water
  - Utilize nutrients
- Clean up streams; maintain natural habitat
- Increase crop production
- Not high tech – uses well known technology
- Could be cheaper
- Utilize unproductive land
- Better public perception of waste management

Green Technology

How Technical is it?

- Uses basic in-plant treatment technology
  - Nutrient removal not necessary
- Simple, proven agricultural technology
- Standard agricultural management techniques
- Adaptable to small and large systems

Simple and Proven

Land Treatment Concept Defined

Land treatment is the application of partially treated wastes to vegetation and soil systems to achieve further treatment and/or renovation, to utilize and recycle nutrients, to reduce or eliminate surface water discharges, and to provide long term protection of the receiving environment.

Land Treatment
Non-degradation Constraint

No land is irreversibly removed from any future potential use

Where?

- Existing land use base or new dedicated land
- Biomass production (woody energy plantations)
- Forage crops (also energy potential)
- Golf courses, roadsides, parks (requires a higher degree of initial treatment)
- Highly suited for dispersed systems instead of larger, centralized systems

Adaptable to any climate and location

Other Factors to Consider

- Degree of treatment required, e.g., biomass plantations, crops or golf course (separate treatment streams?)
- Distributed treatment works closer to irrigation sites instead of large centralized works
- Winter storage held for summer irrigation
- Is winter discharge during higher stream flow possible?

Essential Elements

First

- Multi-disciplinary team (engineers, agriculture and forest scientists, hydrologists, etc.)
- Clear statement of objectives
- Evaluation of alternatives (Capital cost should not be only determining factor?)
- Environmental impacts (or lack thereof)

Then

- Site evaluation
- Design
- Construction and implementation
- Operation and management
- Monitoring

Overcoming Objections

- Bring public on board early in the alternatives evaluation
- Educate public and regulatory authorities
- Work with regulators to update regulations to recognize world-wide experience and adaptability to local conditions
- Can be an add-on to existing waste treatment facilities
- Emphasize long-term investment costs, not initial capital costs
- Public health not compromised
- Ecosystem and habitat recovery and/or maintenance

Bottom Line

- Practiced for many years in many locations and climates
- Proven to be cost-effective
- Natural processes – a Living Filter
- Adaptable to existing treatment systems
- Replaces need for advanced waste treatment processes
- Does not employ untested technology
- Applicable to large or small systems
- Does not require large centralized treatment systems
- Site specific design – not cookbook