**Pumper – Need to Know**

1. **The professional will understand the various techniques and responsibilities for performing tank maintenance.**
	1. Underground Tank Locating Techniques
		1. Ardy Eff
		2. Probe
		3. Geophysical
		4. Plumber’s Snake
		5. Witching
		6. Records
		7. Electronics and Camera
	2. Removing the Maintenance Hole Cover
		1. Buried Lid – Must pump through manhole and not inspection hole
		2. Landscape Protection
		3. Safety Concerns - Gopher One
			1. Tools Needed
		4. Above Ground Lid
		5. Concrete Lid
			1. With Loops
			2. Without Loops
		6. Plastic Lid
			1. Special Wrench
		7. Tools Needed
			1. Bar/hooks
			2. Pull/strap/chain
			3. Tool box with various screwdrivers
	3. Replacing and/or Adding a Manhole Lid
		1. Legal Requirement
			1. New systems
			2. Existing Systems
				1. Requirements apply to non-complying tank?
	4. Manhole and lid specifications
		1. Adding Risers
			1. Pumper’s authority to add risers
			2. Plastic Risers
				1. Advantages
				2. Disadvantages
				3. Riser Requirements – strength, height, diameter
				4. Sealing Tank Lid – Checking for Watertight Seal
			3. Concrete Risers
				1. Advantages
				2. Disadvantages
				3. Riser Requirements – strength, height, diameter
				4. Sealing Tank Lid – Checking for Watertight Seal
	5. Inspection Pipes
		1. Check for damage
		2. Replace
	6. Checking Tank Operation
		1. Checking liquid levels
			1. Low level and high levels (surging)
				1. Identification

observation of liquid level below invert of outlet

observation of liquid level above air space, into riser, or surfacing

* + - * 1. Significance

low level indicates crack

high levels indicate:

high peak instantaneous flow

blocked outlet baffle

baffle no longer in place

scum levels too thick

blocked supply pipe (solids, grease, frozen)

identification

remedy

supply pipe sloped in wrong direction

tank installed backwards

tank not level (outlet higher than inlet)

pump not operating

drainfield ponded and draining back to tank

check liquid levels in inspection pipes

* + 1. Insulate top of tank and inspection pipes
		2. Checking Stratification
			1. Identification methods
				1. Sludge judge and stick with foot
				2. Stick w/towel and stick with foot
				3. visual evidence of scum layer
				4. Identification of toxic substances (odor, color, told of discharge, factory process water connected to plumbing etc…)
			2. Significance of no stratification
				1. toxic substances
				2. recently pumped
				3. medicine
				4. leaks
				5. peak flow flushing
				6. no baffles
				7. hot water discharge
			3. Toxic/Hazardous Waste Response
		3. Checking Baffles
			1. Observation Methods
				1. Mirror
				2. manhole cover removal
				3. inspection pipe observation
			2. Significance of No Baffles
				1. Regulatory
				2. Operation
			3. Repair Baffles
				1. Pumper authorized to repair baffle - yes
				2. Permit requirements – Dependant on local ordinance
				3. Methods of Repairing Baffles
	1. Safety
		1. Electrical
			1. Hazards
			2. Precautions
		2. Pathogens
			1. Hazards
			2. Precautions
		3. Gases
			1. Poisonous
				1. Hazards
				2. Precautions
			2. Explosive
				1. Hazards
				2. Precautions
			3. Confined Space Entry
		4. Needles
			1. Hazards
			2. Precautions
		5. Chemicals
			1. Hazards
			2. Precautions
	2. Removal of Material
		1. Equipment
			1. Truck
				1. Suction/Lift Requirements

Backwash capabilities

Lift/Distance capabilities

* + - * 1. Axle Weight/Road Restrictions

What are road restrictions/why are they placed?

What roads are affected (state, county, township, city streets)

What are the typical limits

Dates typically imposed

How to calculate with the truck

* + 1. pH Testing Equipment
			1. pH Basics
				1. What is pH
				2. What does it do
				3. Units of measure
			2. Sampling and Testing
				1. Taking a sample
				2. Measurement methods
		2. Back flush/Compete Removal
			1. Significance
			2. Methods
		3. Post Cleaning
			1. Do not disinfect tank
			2. Do not add starters
		4. Dewatering and return filtered liquid to tank
		5. Spills
	1. Dosing Chamber
		1. Manhole covers
		2. Ring placement
		3. Adding Manhole
		4. Additives
		5. Pump Replacement
			1. How to determine what is broken (breaker, float, cord, pump, pipe clog)
			2. Sizing of pump
		6. Soil treatment repair (general)
		7. Steamers and Boiler Operators
		8. Pumping requirements
1. **The professional will understand the various techniques, responsibilities and requirements of septage treatment.**
	1. Treatment Options
		1. Publicly Operated Treatment Works (POTW) Disposal
			1. Agreements
			2. POTW perspective
		2. Land Application
		3. Composting
		4. Landfill [Allowed, if applicable rules are followed -**John**]
		5. Storage
		6. Incineration [Allowed, if applicable rules are followed – **John-**]
		7. Dewatering
	2. Characteristics of Septage
		1. Definition of Septage
			1. Federal Definition
			2. State Definition
			3. Grease Trap Waste
			4. Mixed wastes
		2. Septage Production
			1. Per household
			2. Accumulation rate in tank
			3. Statewide production
		3. Chemical Characteristics of Septage
		4. Biological Characteristics of Septage
	3. Land Application of Septage
		1. Land Application Regulations
			1. Federal Regulations
				1. What materials it covers
				2. What practitioners it covers
				3. Who enforces
				4. Scope of coverage
				5. Sites covered
				6. Other
			2. State Guidelines
				1. What materials it covers
				2. What practitioners it covers
				3. Who enforces
				4. Scope of coverage
				5. Sites covered
				6. Other
				7. State Licensing for Pumpers
				8. State Model Ordinance
			3. Local Ordinances
				1. What materials it covers
				2. What practitioners it covers
				3. Who enforces
				4. Scope of coverage - local
				5. Sites covered
				6. Other
		2. Site Suitability for Land Application
			1. Separation Distances
				1. Wells
				2. Residences
				3. Developments
				4. Public Contact Sites
				5. wetlands
				6. tile inlets
			2. Soils
	4. Soils
		1. Function of Soil
		2. Suitable Characteristics
			1. Surface Texture
			2. Surface Permeability
			3. Depth to Bedrock and Watertable from zone of application
			4. Flooding potential
			5. Slope / Topography
		3. Suitable Soil Determination
			1. Information Contained in Soil Survey
			2. Where to Find a Soil Survey
			3. How to Find a Specific Location in Soil Survey
			4. Evaluating Soil Series for Suitability based on Suitable Soil Characteristics
	5. Application Rates
		1. Daily Hydraulic Limit Rate
		2. Winter Hydraulic Limit Rate
		3. Annual Application Rate Limits
			1. Nitrogen based approach for determining annual crop utilization
			2. Maximum Allowable Nitrogen Application (MANA) concept
			3. Obtaining resources for crop nitrogen usage estimates
			4. Crediting Septage nitrogen contribution for annual crop requirements
			5. Recognize the importance of record keeping for responsible nutrient management
	6. Pathogen Reduction
		1. Lime Treatment
			1. Purpose of Lime
			2. Treatment levels required
			3. Suitable Lime materials
			4. Amounts needed
			5. Addition methods
			6. Sampling methods
			7. Safety (Quick Lime/Quick Lime)
		2. Monitoring of Septage pH
			1. Meters
			2. pH paper
			3. Temperature corrections
			4. Recording
		3. Incorporation / Injection
	7. Vector attraction reduction
		1. Lime treatment
		2. Incorporation/injection
	8. Recordkeeping
		1. State recordkeeping requirements
		2. Federal recording requirements
		3. Report to homeowners
		4. Report to LUG
			1. Pumper responsibility to develop and maintain record keeping system detailing land application operations
			2. Location(s) of all sites where septage applied
			3. Map of application site detailing where septage applied and where not applied
			4. Total usable acres on application sites
			5. Crop grown on sites
			6. Dated totals of all site applications
			7. Pathogen / vector reduction measures