

REMEDICATION, REJUVENATION,
REHABILITATION, RECOVERY OF EDAs in NH

- Lots of terms used
- Generally means to add life to the EDA
- Or to “bring the EDA back to life”
- I’ll call the process “R&R” (you choose the r’s)

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- PROBLEM: EDA not accepting all the flow from source
- MOST OBVIOUS SYMPTOM IS SURFACING
- OR, BACKING UP into served structure

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- **NOT**, REPEAT **NOT** INTENDED TO APPLY TO AN EDA WHICH IS IN THE WATER TABLE
- OR WHICH IS IN ACUTE HYDRAULIC FAILURE (HAPPENED SOON AFTER STARTUP)
- OR, PROBLEMS WITH “BASAL FAILURE”, WHERE THE ORIGINAL SOIL CANNOT ACCEPT THE LOAD

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- LET'S ADDRESS RULE FIRST.
- RULES do NOT directly address R/R
- Do address failure, as defined by statute

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- 485-A:2 Definitions. – IV. "Failure" means the condition produced when a subsurface sewage or waste disposal system does not properly contain or treat sewage or causes the discharge of sewage on the ground surface or directly into surface waters, or the effluent disposal area is located in the seasonal high groundwater table.

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- Sounds simple, right?
- NOT!!!
- Leaving aside EDAs in the water table, or failing to treat...

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- “Failure to contain” implies effluent breakout, directly from the EDA
- Echoed by the seemingly redundant “causes the **discharge of sewage** on the ground surface or directly into surface waters”
- What about backup into the tub?

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- Does one event of breakout constitute failure?
- If not, how many?
- What about effects of high water use, leaking fixtures, houseguests, laundry day, or other factors which may be corrected?

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- IF AN EDA **WAS** IN FAILURE, BUT IS NOT NOW FAILING **MUST** IT BE REPLACED BY RULE?

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- I raise this because when we sought guidance from SSB, we got the reply that “failed systems MUST be replaced”.
- No provision in rule for R/R...
- To quote,

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- *As I was explaining to Tom the other day, **if a system is failed, it must be replaced.** There are no provisions in rule or law that allows for the “rejuvenation” of a failed system. If the system is not failed, and as we all know that determination can be somewhat discretionary, the system may be rejuvenated by any means that have been approved by the department (e.g., Terralift, Enviro-Septic’s rejuvenation method approved in its manual, SoilAir).*

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- To repeat: ... **if a system is failed, it must be replaced.**
- *BUT if it is not now failed, because of reduced use or other corrections, such as correcting flow imbalances...must it be replaced?*

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- Rule does not seem to MANDATE replacement
- BUT is possibly more severe
- In part:

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- FROM RULE:
- (a) The owner of an ISDS in failure as defined in
- RSA 485-A:2, IV shall **CEASE USING THE EDA** so as to:
- prevent any wastewater from flowing onto or into the ground or to the EDA, either by **VACATING THE PREMISES SERVED BY THE ISDS OR BY HAVING A LICENSED SEPTAGE HAULER PUMP OUT THE SEPTIC TANK** at sufficient frequencies to prevent wastewater from otherwise exiting the septic tank.

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- Out in the real world, we seldom see anyone forced to vacate, although pump orders do happen. If an EDA is not surfacing, or breaking out, and is not “failing to treat” or is not in the water table, such action may be unlikely.

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- So, if some action may provide relief, R/R efforts may proceed (in our opinion).
- Bets may be off if the EDA has been OFFICIALLY deemed in failure.

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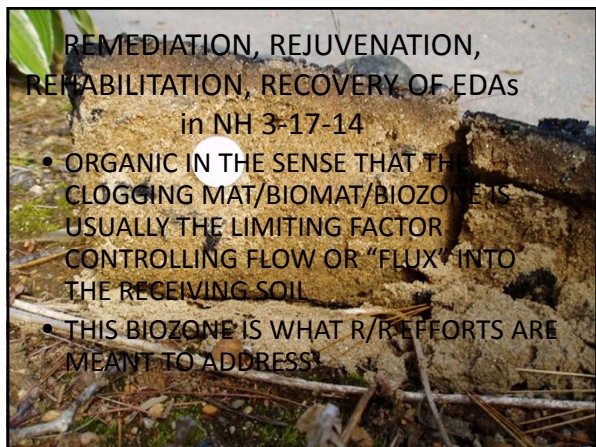
- LETS MOVE ON! BUT, THIS DISCUSSION SHOULD NOT BE OVER...

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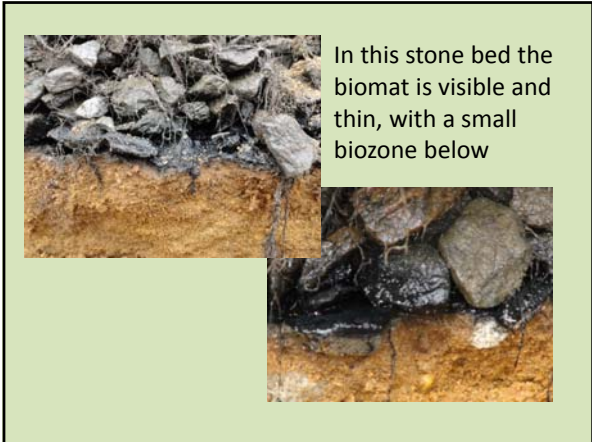
- WHEN AN EDA IS UNABLE TO HANDLE ITS INFLOW VOLUME
- THE PROBLEM IS BOTH HYDRAULIC AND ORGANIC

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- HYDRAULIC IN THE SENSE THAT LESS LOAD MIGHT ALLEVIATE THE PROBLEM
- LESS WATER! UNUSED SYSTEMS SELDOM FAIL...







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- Initial EDA capacity is hydraulic before any clogging develops-that is, capacity is basically how much water the EDA can accept
- This initial capacity is MANY times the "Long Term Acceptance Rate", the LTAR, of the EDA biozone

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- MOST OF US KNOW EDAs CAN RECOVER CAPACITY
- VACATION HOMES ARE A GREAT EXAMPLE

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- RESTING ALLOWS THE ACCEPTING SURFACE TO DRY OUT AND CLOGGING FACTORS TO BIODEGRADE
- RESTING CAN BE DESIGNED IN
- MULTIPLE EDAs MAY BE RESTED AND LOADED

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- IN 1970s I BEGAN TO DESIGN SOME EDAs WITH TWO, HALF-SIZE BEDS OR OTHER EDAs (Dry wells, trenches, chamber areas)
- Designed second beds to take over load from "stressed" beds
- AND DID SOME RELIEF AREAS IN MHPs (shhhh)
- ALSO SAW THE RAPID LOSS IN COLOR OF BED BOTTOMS WHEN EFFLUENT LOAD ENDED

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- As time went on I focused more on improved media, SAND SAND SAND!
- And passive treatment -2 tanks, filters
- Pressure distribution

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- Report in about 1998 on recovering failing systems with treated effluent, "secondary treatment"
- 13 of 15 systems reported "fixed"
- Other 2 deemed inadequate to begin with

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- Led to my early efforts in 1999 to recover a flooded bed
- Homemade ATU- drained down stone bed-still working
- Despite aerator not in place since about 2006

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- several other efforts, mixed success

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- AS WITH ANY “R”, INCLUDING REPLACEMENT, BEING SURE OF THE PROBLEM IS KEY TO SUCCESS

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- IGNORING OR MISSING MORE BASIC ISSUES SUCH AS:
 - HYDRAULIC OVERLOAD, OR
 - MOUNDING, OR
 - RESTRICTIVE ZONE OR LAYER BELOW LEADS TO FAILED EFFORTS

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- BASAL OR “BED BOTTOM” PROBLEMS ARE REALLY DIFFICULT AND SELDOM GOOD CANDIDATES FOR ANY R/R/R/R

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- MAY LEAD TO A QUICK SECOND FAILURE
- AND I MAY GET A CALL...or, Gary may get called

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- So, what is a good candidate for R/R?
- An EDA with good initial life, 10+ years for conventional EDAs
- Not in the water table
- Built on a sand bed or in a sand mound improves chances

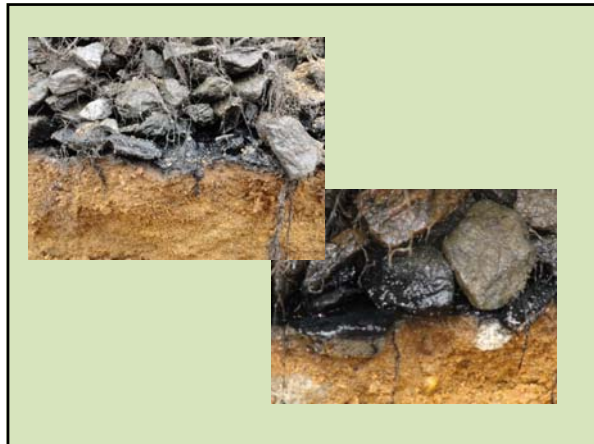




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- A GROWING LOCAL AND NATIONAL
TREND, IS REMEDIATION USING
SECONDARY EFFLUENT FROM ONE OF
THE MANY AVAILABLE ONSITE
TREATMENT UNITS

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Questions to Evaluate before Rejuvenation

Gathering Information

System Type

- Residential
 - Full Time Occupancy
 - Number of People in Home
- Age of system
- Type of System
 - Chamber (type)
 - GEO -Flow or Enviro Septic
 - Eljen In-Drain
 - Stone & Pipe
 - Design Flow

Questions to Evaluate before Rejuvenation

Gathering Information

- System approved by DES / DEP
 - Approval Date
 - Do owners have Plans
- Number of Bedrooms
 - Living Units (2 family)
- Home Business
- Fixtures Connected
 - Garbage disposal
 - Water treatment system
 - Soaking Tubes
 - Washing Machines
 - Dishwasher

Questions to Evaluate before Rejuvenation

Gathering Information

- **Maintenance Records**
 - Last Pumped
 - Repairs Made
- **Malfunction:**
 - Sewer back in House
 - Slow Draining
 - Surface Breakout
 - Odors
- **Water Supply**
 - Well
 - Municipal

Questions to Evaluate before Rejuvenation

Gathering Information

- **Soils Information**
 - Soil Types
 - Test pit Logs
- **Question Cause of Failure / When**
 - Leaking Toilet
 - Heavy Weekend Use
 - Spring
 - Rain events

Questions to Evaluate before Rejuvenation

Site Evaluation:

- Site Grading around EDA
- Roof Runoff
- Recent Construction Activity

- **Soils Information**
 - Soil Types
 - Test pit Log
- **EDA**
 - Gravity
 - Pumped
 - Vented

Questions to Evaluate before Rejuvenation

Site Evaluation:

- **Inspect System Components**
 - Septic Tanks
 - Size
 - Pump Chamber
 - Dose volume
 - D-Box
 - Level
 - Groundwater leaks

Questions to Evaluate before Rejuvenation

Site Evaluation:

- **Soils Probes into existing EDA**
 - Find Edge of Beds
 - Confirm Size shown on Plans
 - Depth of cover
 - Soil Type
 - Texture
 -
 - Ponding
 - Biomat
 - Thickness
 - Perc test of natural material

Questions to Evaluate before Rejuvenation

Site Evaluation:

Summary of Findings

- Cause of problem
 - Hydraulic overloading
 - Change of Use
 - Exceeds Design
 - Leaking Toilets / Facuets
 - Groundwater Leaks
 - Runoff
- Organic Overloading
- Soils
- Construction Related

Questions to Evaluate before Rejuvenation

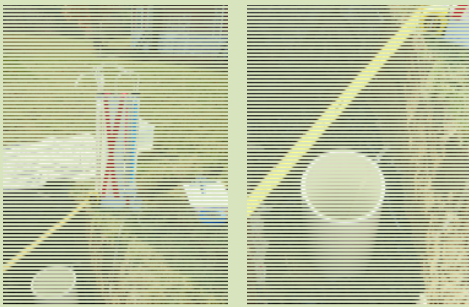
Site Evaluation:

Rejuvenation Yes / No

- Is it Feasible based on Observations
- Product Recommendations
- Water Conservation Plan

When is Rejuvenation not feasible?

- Hydraulic Overloading caused by
- Increase in use beyond design
- Groundwater Leaks
- Change in Groundwater Elevations
- Poor Construction



Modified perc. tests to look at hydraulic loading rates at opposite ends of the leach field.



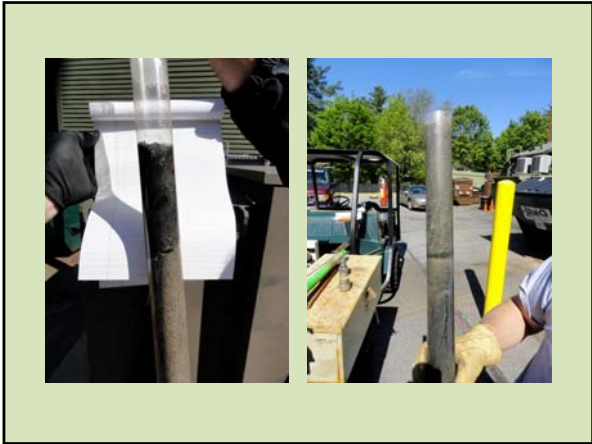
Based on the test conducted the loading rates were calculated at 2.0 gpd/sq.ft in Area 1 and 0.5 gpd/sq.ft in Area 2.

The leach field the system was designed base on a loading rate of 2.8 gpd/sq.ft.



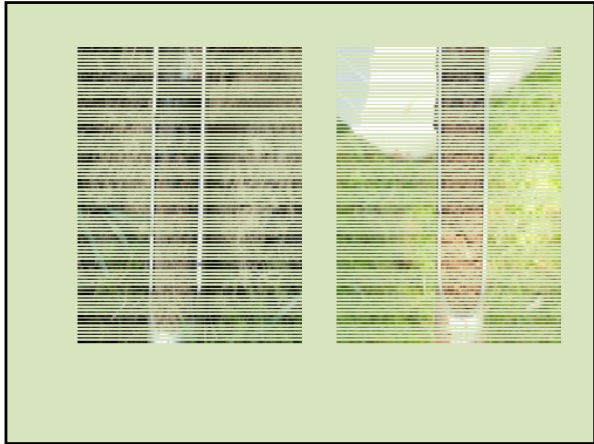




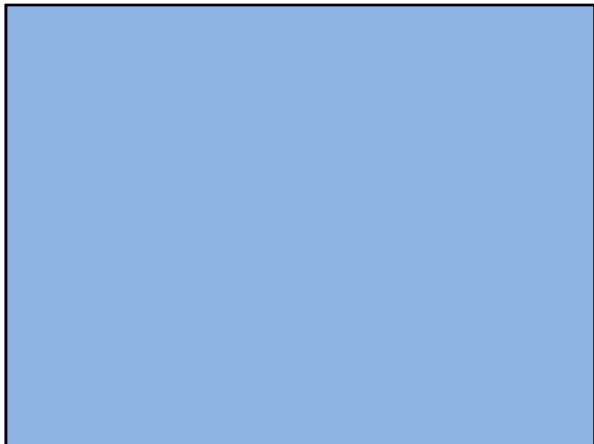












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- Approaches for “proprietary” EDAs may include:
- “drain and air” per the PEI manual
- Developing a resting and loading scheme for non-serial EDAs

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- A recent pair of apartment Enviro-Septic EDAs was chosen for this approach
- Two EDAs in failure
- Each EDA a “combination” with multiple sections of five serially connected runs
- Open, drain, air (for a LONG time)

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- PEI came down and performed their evaluation procedures
- After some time of research, decision was to correct the venting, add more
- Replace d-boxes with surface-accessible boxes
- Install monitoring





















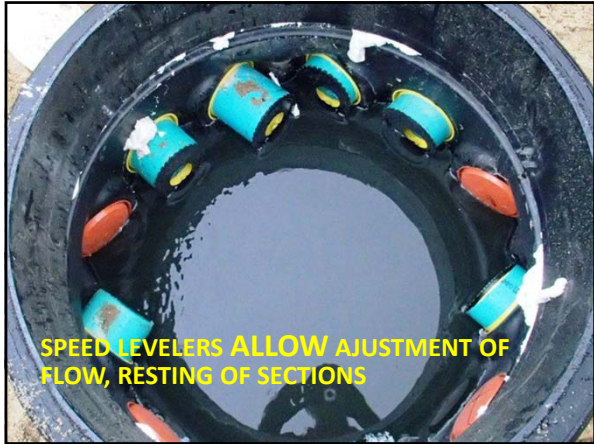








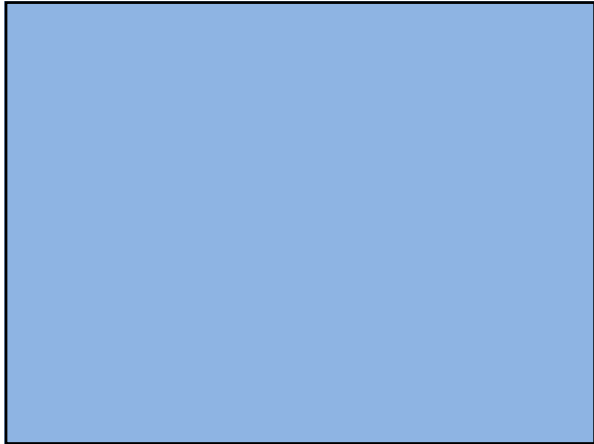




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- HOW LONG RESTING?
- OLD INFO WAS ONE YEAR OR MORE
- PEI SAYS 72 HOURS PLUS
- NEW INFO INDICATE ONE TO THREE MONTHS MAY BE VERY EFFECTIVE IN AN AGGRESSIVE RESTING-LOADING PROGRAM

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- 3-13
- Env-Wq 1003.12 When Installation of Replacement ISDS Required
- (a) If approval of a replacement ISDS is obtained pursuant to Env-Wq 1003.22 relative to systems in failure, the replacement ISDS shall be installed prior to the expiration of the approval, specified in Env-Wq 1003.22(c).
- (b) If approval of a replacement ISDS has been obtained pursuant to these rules for any reason other than to address a system in failure as covered by (a), above, the replacement ISDS shall be installed if the existing ISDS fails or otherwise needs to be repaired or replaced.

- Env-Wq 1003.22 Replacement of Systems in Failure;
- Pumping Required
- .(a) The owner of an ISDS in failure as defined in
- RSA 485-A:2, IV shall cease using the EDA so as to
- prevent any wastewater from flowing onto or into the ground or to the EDA, either by vacating the premises served by the ISDS or by having a licensed septage hauler pump out the septic tank at sufficient frequencies to prevent wastewater from otherwise exiting the septic tank. If the owner elects to pump the tank in lieu of vacating the premises, the owner shall so notify the department and the local health officer and retain all pumping receipts for inspection by department staff or the health officer.

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- (b) All applications submitted for the purpose of correcting an ISDS in failure shall be accompanied by a written statement from the town health officer or a permitted designer confirming that the existing ISDS is in fact in failure.
- (c) Construction approvals granted for replacement of an ISDS in failure shall be valid for a period of 90 days, except that the department shall grant one 90-day extension if circumstances beyond the control of
- the owner have prevented the ISDS from being completely installed. Failure to complete construction within the approval period shall result in the invalidation of the approval.

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- 34.0
- System Bacteria Rejuvenation and Expansion
- This section covers procedures for bacteria rejuvenation and explains how to expand existing systems.
- Note:
- Presby Environmental, Inc. must be contacted for technical assistance prior to attempting rejuvenation procedures.
- Only Advanced EnviroSeptic® and Enviro-Septic®
- are likely to be rejuvenated (not Simple-Septic®)

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- Why would System Bacteria Rejuvenation be Needed?
- Bacteria rejuvenation is the return of bacteria to an aerobic state. Flooding, improper venting, alteration or improper depth of soil material cover, use of incorrect sand, sudden use changes, introduction of chemicals or medicines, and a variety of other conditions can contribute to converting bacteria in any system from an aerobic to an anaerobic state. This conversion severely limits the bacteria's ability to effectively treat effluent, as well as limiting liquids from passing through. A unique feature of the
- AES or ES System(not SS) is its ability to be rejuvenated in place.

- 34.2
- How to Rejuvenate Advanced Enviro-Septic® and Enviro-Septic® Bacteria
- System bacteria are "rejuvenated" when they return to an aerobic state. By using the following procedure, this can be accomplished in most AES
- and ES Systems without costly removal and replacement.

