ADEQ Arizona Department of Environmental Quality Meeting Agenda/Summary

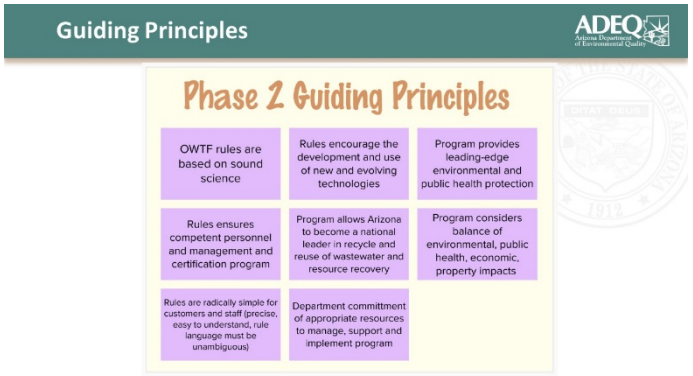
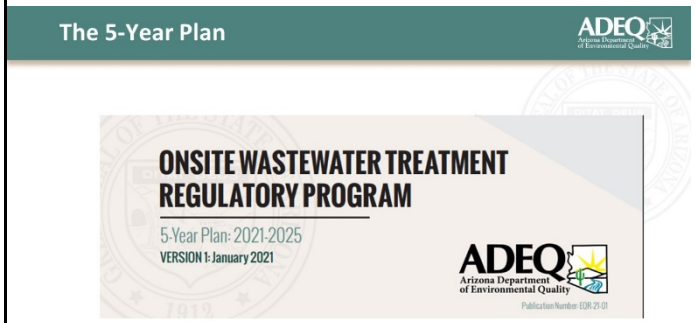
Meeting	Joint Onsite Wastewater Technical Work Groups Meeting
Date	September 20, 2022
Start / End Time	8:30 am – 4:30 pm
Meeting Location	Arizona Virtual Meeting Site, 1400 W Washington, Phoenix AZ (Large Training Room – 1st Floor)
Virtual Meeting Link (Zoom)	Register in advance for this meeting: https://us02web.zoom.us/meeting/register/tZwrfumgrzkiEtYniv3Fj5hWbeTIiWOzaQFL After registering, you will receive a confirmation email containing information about joining the meeting.
Documents	Located in ShareFile https://azdeq.sharefile.com/f/fo1adffe-846a-4431-8902-abb44ee4bdca

Meeting Purpose: To restart the technical work groups to continue development of the Phase 2 program.

Meeting Attendees:

- Trevor Baggiore, ADEQ
- David Bartholomew, Bartholomew Wastewater Services
- Colin Bishop, Anua
- Susan Brenton, MHCA
- Bryan Chiordi, Orenco
- Doug Disbrow, AZ Wastewater Services
- Sheryl Ervin, Infiltrator
- Jake Garrett, Gila County
- Theresa Gunn, ADEQ
- Matt Ivers, ADEQ
- Alex Kendrick, Gila County
- Jim King, Eljen
- Brian Kingsley, Maricopa County
- Karthik Kumarasamy, ADEQ
- David Lentz, Infiltrator
- Linneth Lopez, ADEQ
- Mike Madrid, Apache County
- Kathy Mills, Mills Engineering
- David Monihan, Coconino County
- Ray Morgan, ADEQ
- Nick Noble, Orenco
- Luke Peterson, AZDEQ
- Kitt Farrell Poe, UofA
- Naveen Savarirayan, ADEQ
- Mark Schaffer, Orenco
- Kevin Sherman, SeptiTech, Inc.
- Michael Stidham, EZ Treat
- Jenny Vitale
- Heidi Welborn, ADEQ contractor
- Joelle Wirth, Summit Environmental
- Scott Yarosh, Apache County

ADEQ Arizona Department of Environmental Quality Meeting Agenda/Summary

Agenda Topic	Notes
Welcome Jake Garrett, OWAC Chair	Jake welcomed the participants and thanked them for their time. He asked the group to remain courteous and focus on making progress.
Today's Meeting Theresa Gunn, Facilitator	Theresa asked group to introduce themselves. She also reviewed the ground rules, agenda and guiding principles. The guiding principles were agreed upon at the February 2022 joint TWG meeting. The group agreed for the purposes of making decisions today they would take votes and majority would pass the recommendation forward. Minority opinions can be submitted in writing to ADEQ. 
ADEQ Report Trevor Baggiore, ADEQ Water Quality Division Director	 Trevor reported on the progress ADEQ made during the summer break. He began with an overview on the progress we have made in implementing the 5-Year plan. He stated that the team met with leadership to gain further direction. Although more information is needed, leadership is generally supportive of the elements currently under discussion. A rulemaking exemption memo for Phase 2 rulemaking has been drafted and being reviewed by leadership. He also discussed the external ecosystem which could impact the agency and its direction. Theresa discussed the proposed timeline for the work groups to finish recommendations by May so that ADEQ can prepare for any legislative agenda items for the 2024 session. (See image below)

ADEQ Arizona Department of Environmental Quality Meeting Agenda/Summary

Agenda Topic	Notes

Living Up to Our Commitments

Januarv 2021: 5 Year Plan

Task 1: Initial Rulemaking
The goal of Task 1 is to complete rulemaking to make needed fixes to the existing rule as expeditiously as possible. The type of rule changes to be made in this phase are identified below.
→ Phase 1 NPRM Hearing: October 13, 1 pm, ADEQ

Task 2: Ongoing Process Improvements
The following are projects currently underway. ADEQ will provide OWAC with regular updates on the status of these activities.
→
- Improved OWAC
- Ongoing Development of SPS
- Mapping of Onsite Systems
- Infield Testing

Task 3: Technical Work Groups
Task 3 will involve more in depth research, discussion, and identification of potential alternatives on the issues, which will not be addressed during the initial rulemaking in Task 1. Both OWAC and the WDAC have identified issues, which may need research and/or resolution. See Section 3: Technical Work Groups for more information.
→ Began Meeting in June 2021

Task 4: Additional Rulemaking
If the workgroups identify further rule changes, a second rulemaking is being considered in 2024.
→ Phase 2 Exemption Memo under review to allow for 2024 rulemaking

Phase 2 Direction

You wanted to know if agency was committed ……

We shared with leadership ……

Permit Structure Change

Today:

- Permits are by technology
- 22 Permits
- Difficult to permit new technology
- Focus is on the technology

Proposed:

- 5 Permits
  - Residential
  - Multi-Family
  - Non-Residential
  - Repair
  - Provisional
- Focus on effluent quality

Ideas Under Discussion

Certified Personnel

- Designers
- Installers
- Soil Investigators
- Service Providers (Operators)
- Pumpers

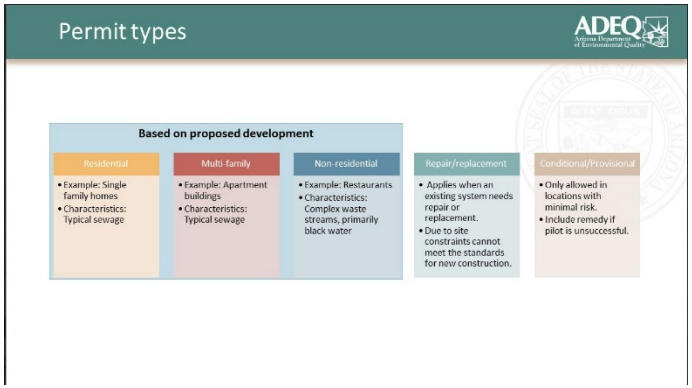
Potential requirements:

- Renewable Operating Permit (OP)
  - Requires inspection and pumping prior to renewal
- Monitoring and maintenance requirements: Multi-Family and Commercial
- Debate: What is the appropriate oversight for residential

ADEQ Arizona Department of Environmental Quality Meeting Agenda/Summary

Agenda Topic	Notes
	Additional Items in Discussion More rigorous Notice of Transfer process A statewide database Nitrogen management areas ADEQ monitoring and compliance Ability to delegate program  **Phase 2 Direction** Leadership felt the Key Elements were viable BUT…. • Will need to show data of a causation relationship • Use caution when regulating single family homeowner  **Ecosystem Changes Coming** New Governor May result in new ADEQ leadership  **TENTATIVE SCHEDULE** TWG Recommendations to OWAC • May 2023 OWAC Recommendations to ADEQ • August 2023 ADEQ Decisions • October 2023 Rulemaking • 2024 

ADEQ Arizona Department of Environmental Quality Meeting Agenda/Summary

Agenda Topic	Notes
Proposed Permit Framework Karthik Kumarasamy, ADEQ	Karthik presented the proposed permit framework which changes from permit by type of technology to permit by structure type. The proposed framework developed earlier this year reduces the number of general permits from 23 to 5. **The group approved the permit structure with the request that the PPL TWG consider the best name for the conditional/provisional permit.** 
Proposed Treatment Levels Karthik Kumarasamy, ADEQ and Nick Noble, Orenco	Karthik and Nick presented the proposed treatment levels developed by the PPL TWG. After discussion, **the members voted to move this information forward to OWAC with the caveat that the levels for conventional systems be added.** |	BOD5 (mg/L)	TSS (mg/L) | |---|---|---| | TL 1 | 25 | 30 | | TL 2 | 15 | 15 | | TL 3 | 10 | 10 | | TL 4 | 5 | 5 | | | Fecal (#/100mL) | |---|---| | TL 1 | <1,000/100 | | TL 2 | <500/100 | | TL 3 | <200/100 | | TL 4 | <50/100 | | | TN mg/L) | |---|---| | TN 1 | <30 | | TN 2 | <20 | | TN 3 | <10 | | TN 4 | <5 | | | P (mg/L) | |---|---| | TP 1 | 15 | | TP 2 | 10 | | TP 3 | 5 | | TP 4 | 2 |

ADEQ Arizona Department of Environmental Quality

Meeting Agenda/Summary

Agenda Topic	Notes
Sizing Drain Fields Karthik Kumarasamy, P.E., ADEQ Principal Engineer	Karthik presented research into how Arizona sizes drain fields compared to other states. See attached presentation. Each member was asked to write a recommendation on how fields should be sized in the phase 2 rule. See attached photos. After discussion the group did not feel they could make a recommendation until they had a side by side comparison of the options.
Statewide Database	The group brainstormed the functions and end users of a new statewide database. See attached comments. A sub group was formed to review the input and put a plan together on how evaluate potential options for the new database.
Upcoming TWG Meetings	Each of the TWG groups discussed the issues they are working on. Other members asked questions and added items they would like to have the groups consider. All of the issues/tasks have been consolidated into the Onsite Wastewater Task Assignment Google Sheet.
Closing Remarks Jake Garrett, OWAC Chair	Jake thanked the members for their participation and successful meeting.

ADEQ Arizona Department of Environmental Quality Meeting Agenda/Summary

Guiding Principles

ADEQ Arizona Department of Environmental Quality

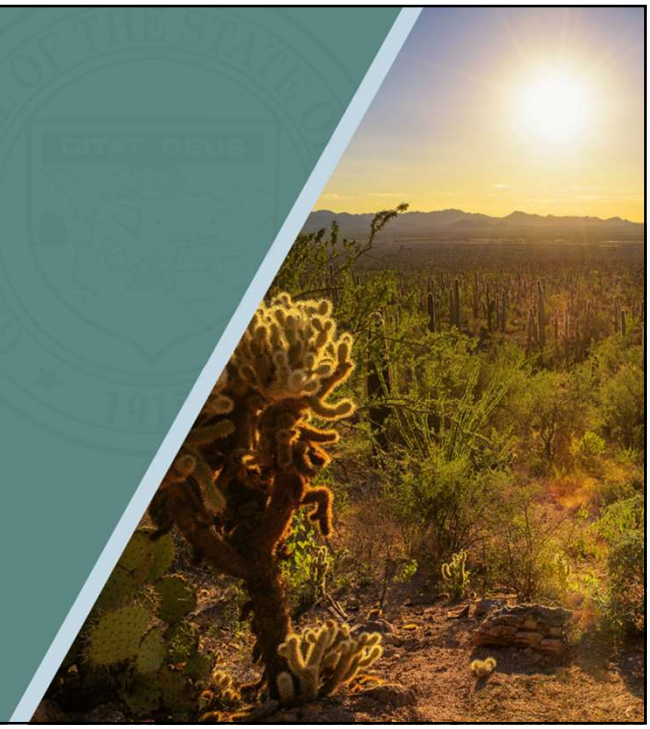
Phase 2 Guiding Principles

OWTF rules are based on sound science	Rules encourage the development and use of new and evolving technologies	Program provides leading-edge environmental and public health protection
Rules ensures competent personnel and management and certification program	Program allows Arizona to become a national leader in recycle and reuse of wastewater and resource recovery	Program considers balance of environmental, public health, economic, property impacts
Rules are radically simple for customers and staff (precise, easy to understand, rule language must be unambiguous)	Department committment of appropriate resources to manage, support and implement program	

Sizing Drainfields

Karthik Kumarasamy | PhD, PE
Principal Engineer

ADEQ Arizona Department of Environmental Quality



SAR for septic tank effluent

ADEQ Arizona Department of Environmental Quality

Percolation Rate from Percolation Test (minutes per inch)	SAR, Trench, Chamber, and Pit (gal/day/ft^2)	SAR, Bed (gal/day/ft^2)
Less than 1.00	A site-specific SAR is required	A site-specific SAR is required
1.00 to less than 3.00	1.20	0.93
3.00	1.10	0.73
4.00	1.00	0.67
5.00	0.90	0.60
7.00	0.75	0.50
10.0	0.63	0.42
15.0	0.50	0.33
20.0	0.44	0.29
25.0	0.40	0.27
30.0	0.36	0.24
35.0	0.33	0.22
40.0	0.31	0.21
45.0	0.29	0.20
50.0	0.28	0.19
55.0	0.27	0.18
55.0+ to 60.0	0.25	0.17
60.0+ to 120	0.20	0.13
Greater than 120	A site-specific SAR is required	A site-specific SAR is required

G. Is the texture of the horizon loam or sandy loam and the structure massive?	0.20	0.13
H. Is the texture sandy clay, clay, or silty clay of low clay content and the structure moderate or strong?	0.20	0.13
I. Is the texture sandy clay loam, clay loam, or silty clay loam and the structure weak?	0.20	0.13
J. Is the texture sandy clay loam, clay loam, or silty clay loam and the structure moderate or strong?	0.40	0.27
K. Is the texture sandy loam, loam, or silty loam and the structure weak?	0.40	0.27
L. Is the texture sandy loam, loam, or silt loam and the structure moderate or strong?	0.60	0.40
M. Is the texture fine sand, very fine sand, loamy fine sand, or loamy very fine sand?	0.40	0.27
N. Is the texture loamy sand or sand?	0.80	0.53
O. Is the texture coarse sand?	1.20	A site-specific SAR is required

SARa – Cleaner effluent

One quantity (SAR_a) varies as a power of another (SAR).
For a product, TSS and BOD are constant.

constant

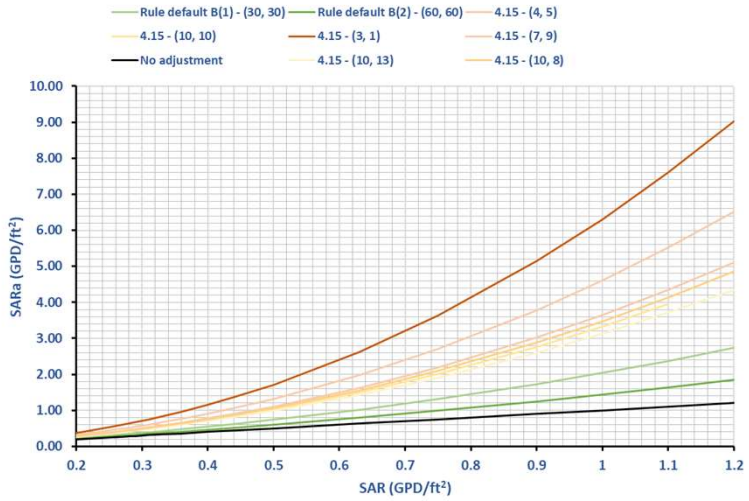
Moves it in the vertical axis

$$SAR_a = \left[\left(\frac{11.39}{\sqrt[3]{TSS + BOD_5}} - 1.87\right) SAR^{1.13} + 1\right] SAR$$

a. "SAR_a" is the adjusted soil absorption rate for disposal works design in gallons per day per square foot,
b. "TSS" is the total suspended solids in wastewater delivered to the disposal works in milligrams per liter,
c. "BOD_5" is the five-day biochemical oxygen demand of wastewater delivered to the disposal works in milligrams per liter, and
d. "SAR" is the soil absorption rate for septic tank effluent determined by the subsurface characterization method described in R18-9-A310.

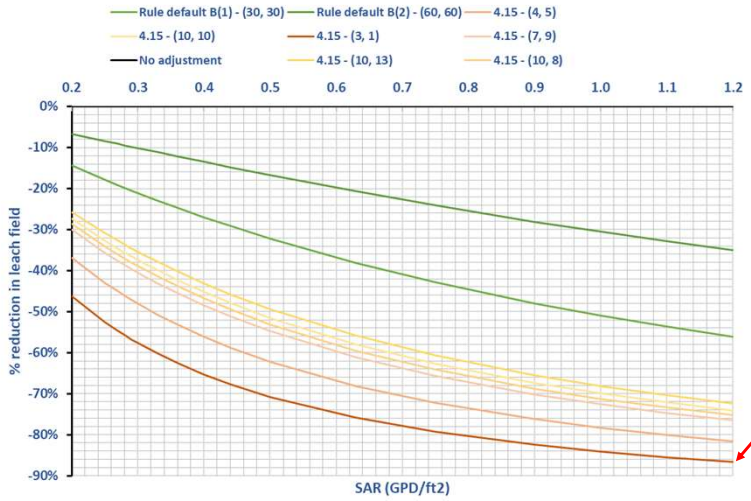
Effect of adjustment

Absolute



Effect of adjustment

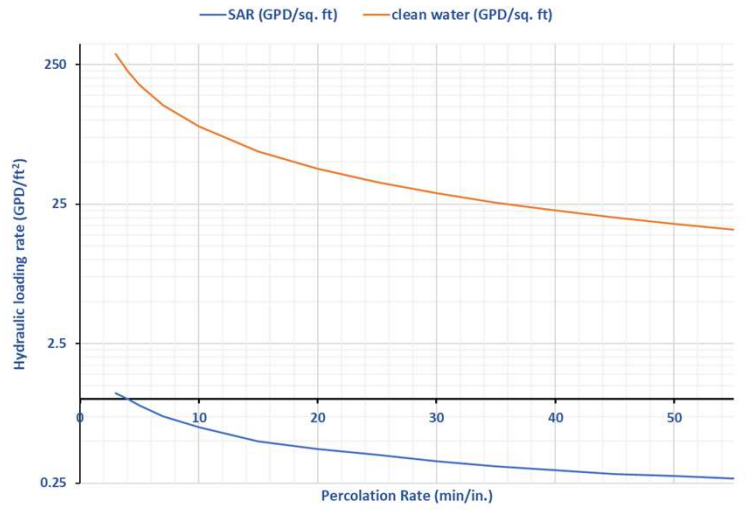
Change basis



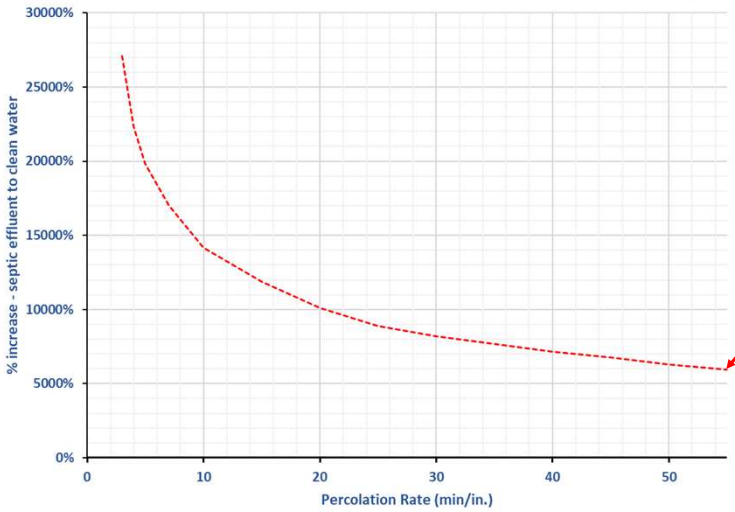
Worst case – 87%

Impact of treatment

via septic tank



% increase in loading rate
septic effluent vs. clean water



Comparison with other states

- Washington
- Colorado
- North Carolina
- Utah
- Virginia
- EPA 2002 (i.e., Tyler 2002)

Washington

With the higher level of treatment, there will be a substantial reduction of the biomat. Recommend a maximum increase of 20%

Loading rates are different between AZ and US EPA 2002 report

Source

Maximum Hydraulic Loading Rate

Soil Type	Soil Textural Classification Description	Loading Rate for Residential Effluent Meeting /TL D or greater (gal./sq. ft./day)
1	Gravelly and very gravelly coarse sands, all extremely gravelly soils excluding Soil types 5 & 6, all soil types with greater than or equal to 90% rock fragments.	2.0
2	Coarse sands.	2.0
3	Medium sands, loamy coarse sands, loamy medium sands.	1.6
4	Fine sands, loamy fine sands, sandy loams, loams.	1.2
5	Very fine sands, loamy very fine sands; or silt loams, sandy clay loams, clay loams and silty clay loams with a moderate structure or strong structure (excluding a platy structure.	0.6
6	Other silt loams, sandy clay loams, clay loams, silty clay loams.	0.3
7	Sandy clay, clay, silty clay and strongly cemented firm soils soil with a moderate or strong platy structure any soil with a massive structure any soil with appreciable amounts of expanding clays.	Not suitable

Colorado

Septic tank effluent rates similar to AZ and EPA report, however, cleaner effluents deviate from AZ calculations

Source

Soil Type, Texture, Structure and Percolation Rate Range					Long-term Acceptance Rate (LTAR); Gallons per day per square foot				
Soil Type	USDA Soil Texture	USDA Soil Structure-Type	USDA Soil Structure-Grade	Perc Rate (MPI)	Treatment Level 1[1]	Treatment Level 2[1]	Treatment Level 2N[1]	Treatment Level 3[1]	Treatment Level 3N[1*]
R	>35% Rock (>2mm): See Table 10-1A					>35% Rock (>2mm): See Table 10-1A			
1	Sand, Loamy Sand	Single Grain	0 (Structureless)	5-15	0.80	1.40	1.40	1.55	1.55
2	Sandy Loam, Loam, Silt Loam	PR (Prismatic) BK (Blocky) GR (Granular)	2 (Moderate) 3 (Strong)	16-25	0.60	1.0	1.0	1.1	1.1
2A	Sandy Loam, Loam, Silt Loam	PR, BK, GR Massive	1 (Weak) 0 (Structureless)	26-40	0.50	0.80	0.80	0.90	0.90
3	Sandy Clay Loam, Clay Loam, Silty Clay Loam	PR, BK, GR	2, 3	41-60	0.35	0.55	0.55	0.65	0.65
3A	Sandy Clay Loam, Clay Loam, Silty Clay Loam	PR, BK, GR Massive	1 0 (Structureless)	61-75	0.30	0.45	0.45	0.55	0.55
4	Sandy Clay, Clay, Silty Clay	PR, BK, GR	2, 3	76-90	0.20	0.30	0.30	0.30	0.30
4A	Sandy Clay, Clay, Silty Clay	PR, BK, GR Massive	1 0 (Structureless)	91-120	0.15	0.20	0.20	0.20	0.20
5	Soil Types 2-4A	Platy	1, 2, 3	121+	0.10	0.15	0.15	0.15	0.15

North Carolina

Septic tank effluent rates somewhat similar to AZ

TABLE XVII. LTAR for wastewater systems based on Soil Group and texture class

Soil Group	USDA Soil Textural Class		LTAR in gpd/ft^2
I	Sands	Sand	0.8 – 1.2
		Loamy Sand	
II	Coarse Loams	Sandy Loam	0.6 – 0.8
		Loam	
III	Fine Loams	Sandy Clay Loam	0.3 – 0.6
		Silt Loam	
		Clay Loam	
		Silty Clay Loam	
		Silt	
IV	Clays	Sandy Clay	0.1 – 0.4
		Silty Clay	
		Clay	

Utah

Rates slightly lower than AZ.

TABLE 5

Maximum Hydraulic Loading Rates for Percolation Testing

Percolation Rate (Minutes per Inch)	Absorption Systems Hydraulic Loading Rates (a) (gal/ft^2/day) (c)(d)(e)	Absorption Beds and Mound Systems Hydraulic Loading Rates (b) (gal/ft^2/day) (c)(d)(f)
0-10 (g)	0.90	0.45
11-20	0.70	0.35
21-30	0.60	0.3
31-40	0.55	0.27
41-50	0.50	0.25 (h)
51-60	0.45	0.22 (h)
61-90 (i)	0.40	(j)
91-120 (i)	0.35	(j)

Virginia

Highest loading rate is a 3 compared to our 9.

Table 1
Maximum Pressure-Dosed Trench Bottom Hydraulic Loading Rates

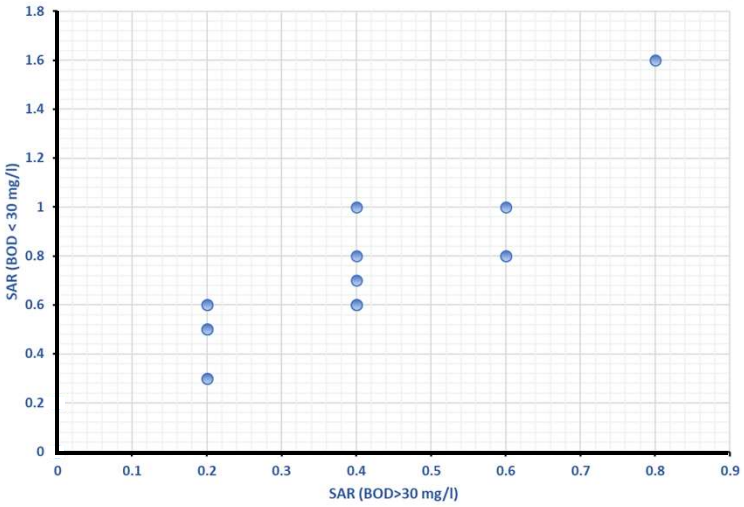
Percolation Rate (MPI)	Saturated hydraulic conductivity (cm/day)	TL-2 Effluent (gpd/sf)	TL-3 Effluent (gpd/sf)
≤15	> 17	1.8	3.0
15 to 25	15 to 17	1.4	2.0
>25 to 45	10 to < 15	1.2	1.5
>45 to 90	4 to < 10	0.8	1.0
>90	< 4	0.4	0.5

Tyler, 2001

TEXTURE	STRUCTURE		HYDRAULIC LOADNG (gpd/ft^2)	
	SHAPE	GRADE	BOD>30 mg/L	BOD<30 mg/L
Coarse sand, Sand, Loamy coarse sand, Loamy sand	Single grain	Structureless	0.8	1.6
Fine sand, Very fine sand, Loamy fine sand, Loamy very fine sand	Single grain	Structureless	0.4	1.0
Coarse sandy loam, Sandy loam	Massive	Structureless	0.2	0.6
	Platy	Weak	0.2	0.5
		Moderate, Strong		
	Prismatic, Blocky, Granular	Weak	0.4	0.7
		Moderate, Strong	0.6	1.0
Fine sandy loam, Very fine sandy loam	Massive	Structureless	0.2	0.5
	Platy	Weak, Mod., Strong		
	Prismatic, Blocky, Granular	Weak	0.2	0.6
		Moderate Strong	0.4	0.8
Loam	Massive	Structureless	0.2	0.5
	Platy	Weak, Mod., Strong		
	Prismatic, Blocky, Granular	Weak	0.4	0.6
		Moderate	0.6	0.8
Silt Loam	Massive	Structureless		0.2
	Platy	Weak, Mod., Strong		
	Prismatic, Blocky, Granular	Weak	0.4	0.6
		Moderate, Strong	0.6	0.8
Sandy clay loam, Clay loam, Silty clay loam	Massive	Structureless		
	Platy	Weak, Mod., Strong		
	Prismatic, Blocky, Granular	Weak	0.2	0.3
		Moderate, Strong	0.4	0.6
	Massive	Structureless		

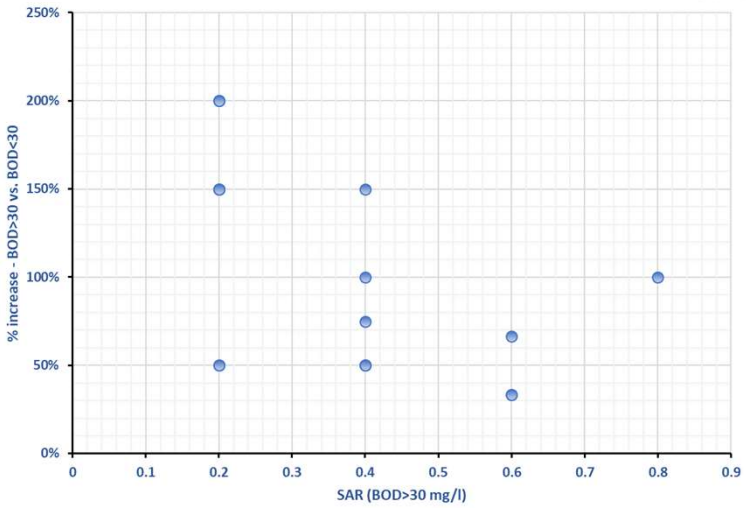
Loading rate – Threshold based

Cutoff – 30 mg/l (Absolute)



Loading rate – Threshold based

Cutoff – 30 mg/l (Change basis)



Conclusions

- Is 20% additional reduction a real problem?
  - 67% reduction with peat and textile filters – rule default
- It is not a math problem.

Jenny's SAR Table

Soil Type	SAR	SAR_{CEM}	Pit
sandy	0.7	0.6	0.9
silty	0.5	0.4	
clay	0.4	0.3	
silty sand	0.6	0.5	
clayey sand	0.4	0.4	
silty clay	0.4	0.3	
silty sand trace clay	0.5	0.4	
sandy gravel	0.6	0.6	
alluvium	0.6	0.5	
colluvium	0.5	0.4	
Schist	perc	perc	
Fractured	perc	perc	

SAR_a = 2001 Formula w/ cap reduction

IF I WAS GOVERNOR...

DRAINFIELDS WOULD BE DESIGNED/SIZED BASED ON:

- Site Investigation/Treatment Level
- Strong Emphasis on Reuse/Recycle to reduce water "disposal"

- Cap At ~~30%~~ To 40%

40% CAP

- Do Analyses Meets Stability Suggestion To Improve The Reduction

- Consider Capping At The EPA BOD Daily Loading Level

Sized based on bedroom count and fixture count as currently written in comb w/ SAR

~~Adjusted~~ SAR OK but limited to ~~no more than~~ max 30%.

Straight percentage

Similar to others

20-25% for NSF/ANSI products

Field testing/verification for addt'l credit

USE the SARA equation

limit the maximum loading rate on each soil type based on the treatment level

ie. 10/10 BOD/TSS 1.2 gpd/ft

if the owner wants more gpd/ft addition survey needs to be done

Ksats
Mounding Analysis
liner Flow Analysis

Keeping the equation aligns with ADEQ's objective to reward performance, so I would keep an equation.

However, extraordinary SARs like 8 gpd/sf appear too high. I would consider capping SARs to levels supported by science.

I would maintain the current chamber sizing equation, which is based upon large-scale field performance testing.

Where PPLs include a 0.70 UPC sizing factor for gravelless technology, I would maintain those allowances

I don't think there is a significant issue with SAR & SARa.

There is a issue with water moving away from the disposal system and going into environment.

IMPLEMENT "NO DRAINFIELD" STRATEGY. ALL EFFLUENT WOULD BE:

1. REUSED
2. STORED
3. RECHARGED

NEED FOR DRAINFIELDS ELIMINATED. STRATEGY WOULD ASSURE AZ WATER SECURITY

ADEQ Onsite Wastewater Treatment Joint TWG Meeting September 20, 2022

Statewide Database Notes

The following are the suggestions from the members provided during the meeting.

Options:

Option 1: Counties keep their databases which are linked to a state database using REM Online or other program (no standardized forms)

Option 2: State sets up a new database which is information repository only (no permitting)

Option 3: Single state permitting, reporting, information repository to be used by all delegated authorities (standardized forms)

Option 4: State website is a portal that links to the locations where the information is stored on other county websites

Option 5: One of the systems above with links to documents, maps and other resources designers need to design a system

Potential Users (One Stop Shop: Whether ADEQ or County)

- Regulators
- Service Providers
- Relators
- Homeowners

Information Repository

NOT Transfer Reports

Interactive map of each permitted system

- Click on a parcel and get information
- Overlay with DWR well locations; flood plain and floodway; etc. (for designers)

Information for each permitted system:

- Photos of install
- Permit documents
- Inspection report(s)
- Maintenance reports
- Monitoring reports

- Changes to System
- NOVs

Triggered Functions

- Alerts to service provider when a property is sold
- Alerts regulator if permit is expired (not renewed)
- Alerts if NOT is not filed

Possible Databases:

- Fast Forms
- REM
- Fetch GIS

State database contacts:
FL - Eb Roader - (850) 901-6512
GA - Tom Vanderboom - (404) 657-6534
VA - Lance Gregory - (804) 864-7491

Barriers/Questions

- No WIFI or cell coverage at remote locations
    - Need to be able to keep data in cache until in service range
- What information will be viewable by: (protection of personal property documents)
    - Homeowner
    - Service Provider
    - Manufacturer (if alternative)
    - Public
    - Realtors/New Buyers
    - Option: anyone can view but limit on who can upload or enter data
- Can documents live in the county websites (planning, building, accessors) and link to the state site
    - Do not want to duplicate what is already online
    - Have the state be a portal that links to other sites but doesn't house the information
- How to get existing information into the new database
- How to protect service providers from getting their business stolen by others
    - Use ID#

QUESTIONS:

- What information does ADEQ need to manage the program
- Is this database to serve the needs of the designer? Before system is installed.

Suggestions:

- Don't build our own database
- Track actions to determine life cycle costs of owning a system