



Maryland Department of the Environment

Southern Kent Island Sanitary Project

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Scope of the Sanitary Project

- Serve 9 communities on Southern Kent Island bordering the Chesapeake Bay and Eastern Bay
- Provide public sewer to 1,518 existing homes
- Provide sewer to a maximum of 632 vacant lots
- Expected build-out of vacant lots is 560 homes
- SKI communities are not in Priority Funding Areas
- County requested a State Revolving Fund loan and Bay Restoration Fund grants

Project Background

- Legacy Problem – Before modern regulations
- Almost all of the septic trenches in groundwater
- Lot sizes too small for replacement systems
- Pathogens not being removed
- Trenches contributing high nitrogen loads to Chesapeake Bay



Project Background

- SKI areas previously planned for W/S service
- Capacity reserved in the KNSG WWTP
- Superior treatment of pathogens and large reduction in nitrogen
- BUT providing sewers expensive/controversial

Project Background

- Maryland law - service must be provided to vacant lots adjacent to a sewer line
- Some infill needed for affordability
- State financial assistance ensures limited infill development
- Strikes a balance - solve public health problem, allow limited infill, achieve affordable project

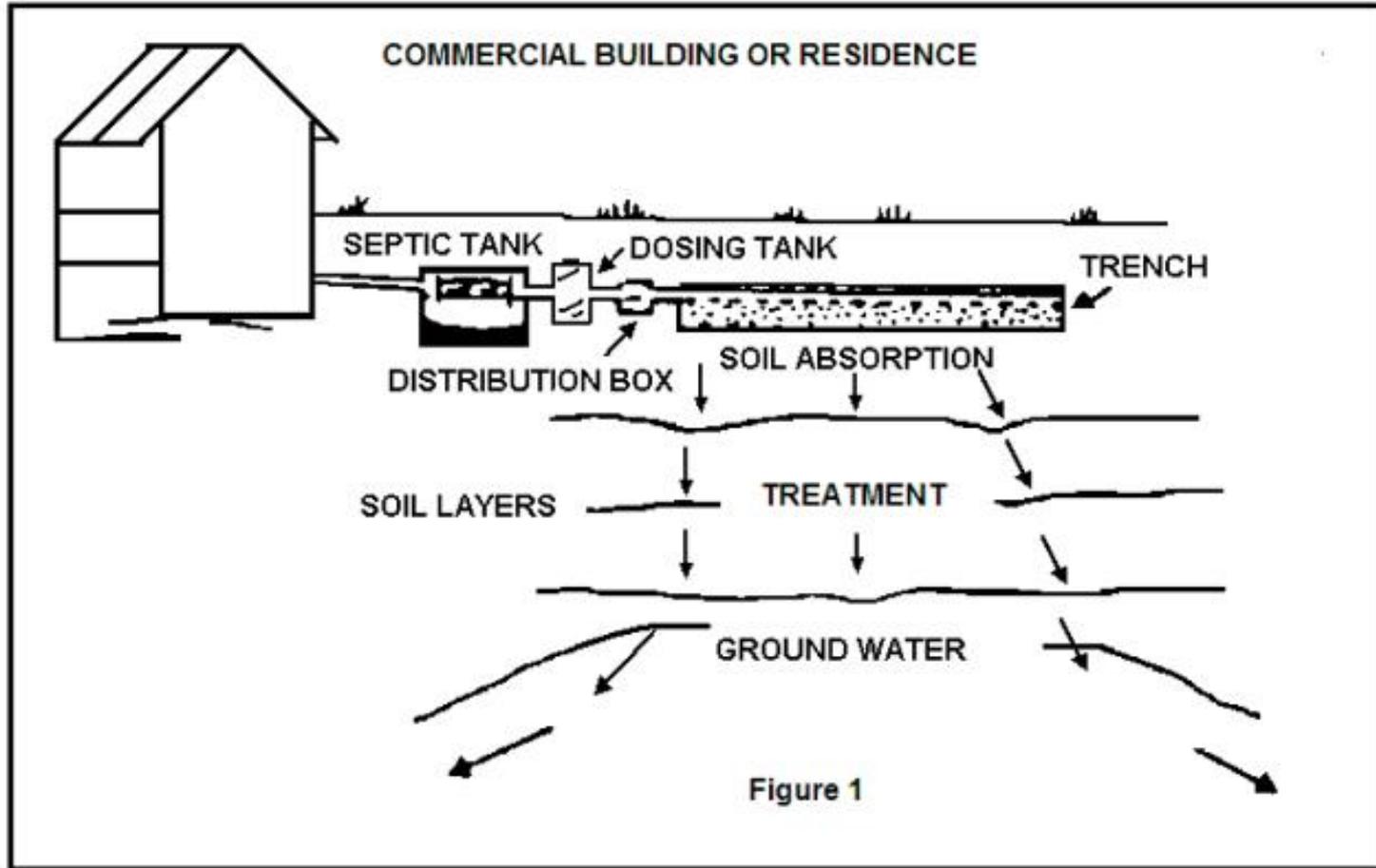
- Failing septic systems and
- Systems penetrating groundwater

Result in

- Little or no treatment of pathogens (bacteria and viruses)
- High nitrogen loads to the Chesapeake Bay

Project Background

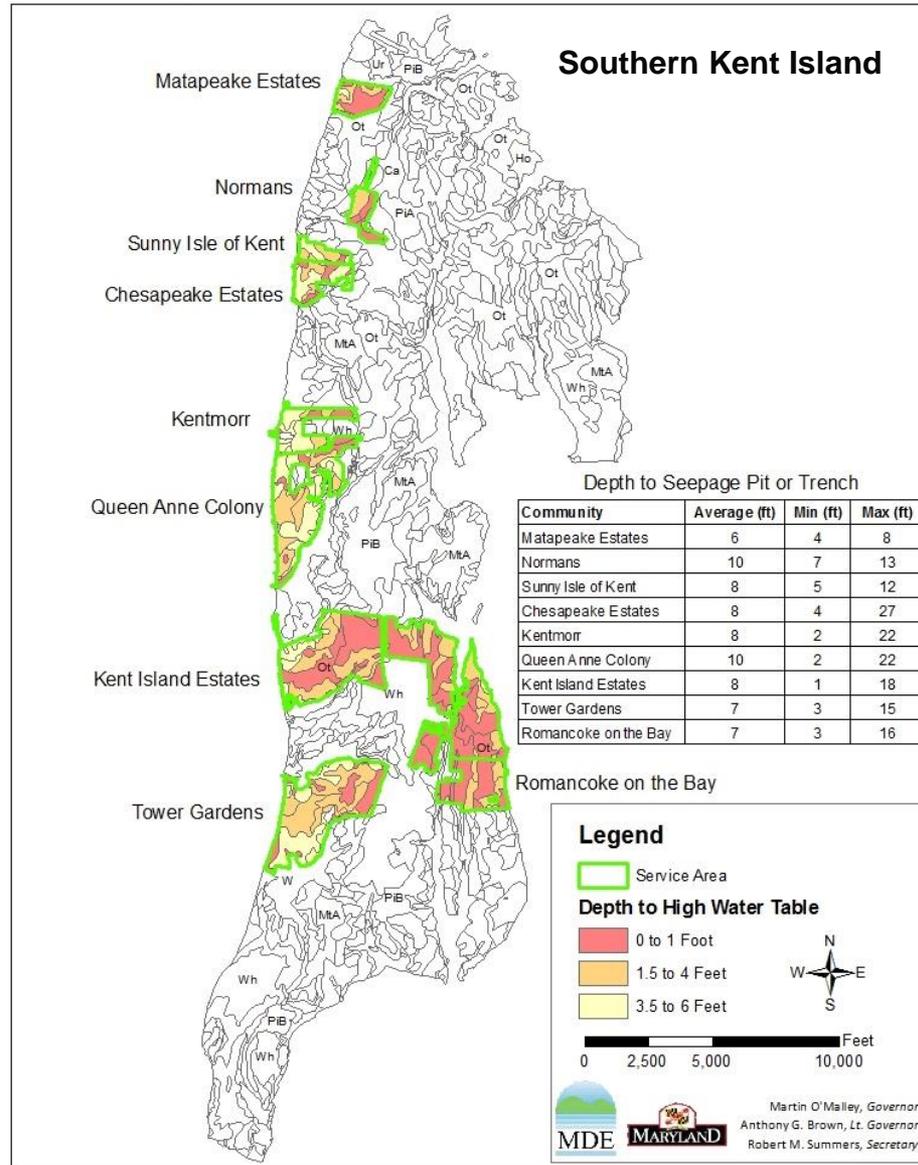
- Septic tank – solids sink to bottom; decomposed by bacteria
- Partially treated liquid effluent goes to trenches or drain fields
- Biomat forms at drainfield/soil interface – fine solids, dead bacteria, soil bacteria
- **Unsaturated soil with oxygen** required to allow aerobic bacteria to live and destroy pathogens



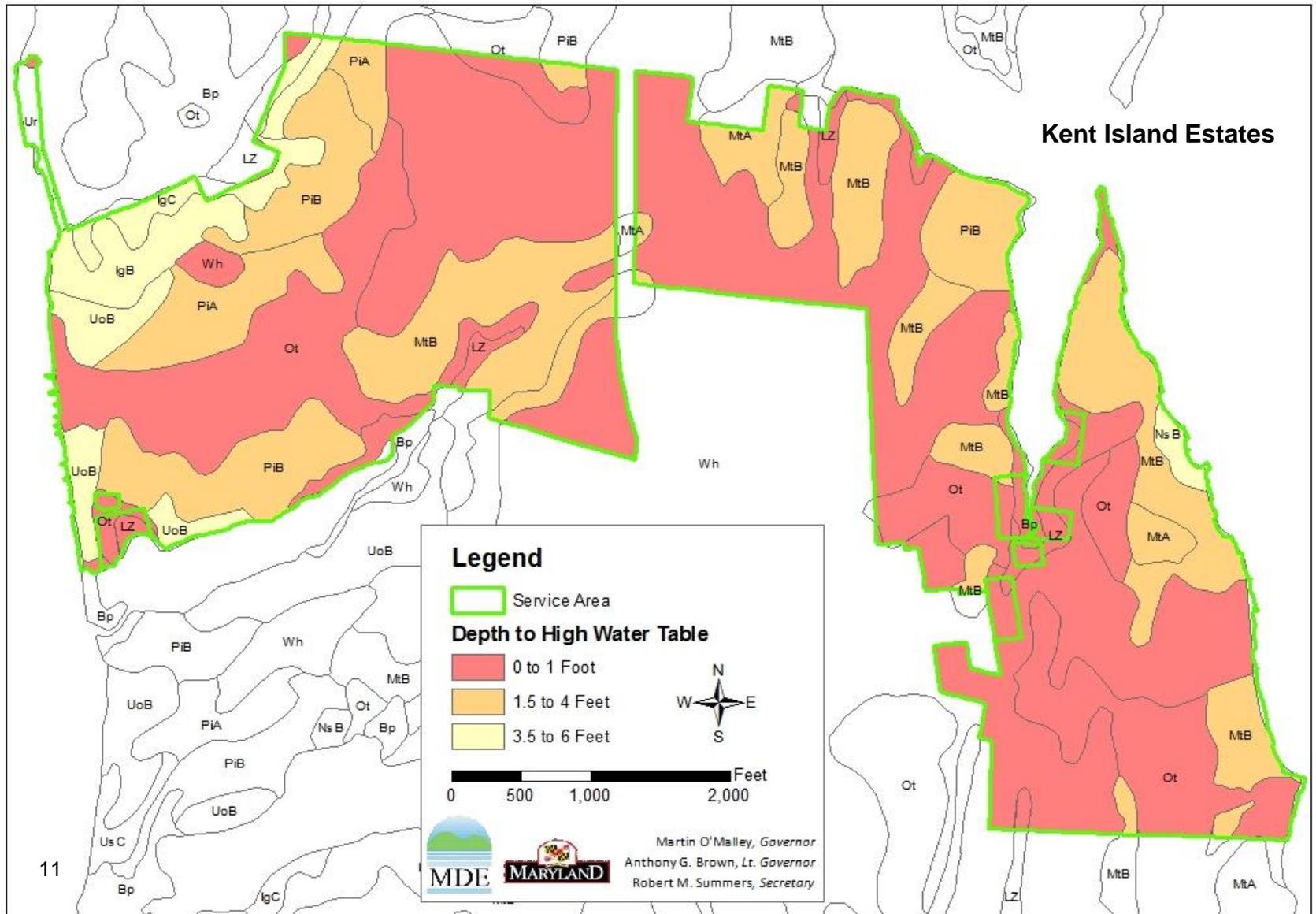
- High groundwater
- Soils with poor permeability
- Small lot sizes

3 Strikes and You're Out!

High Groundwater



High Groundwater





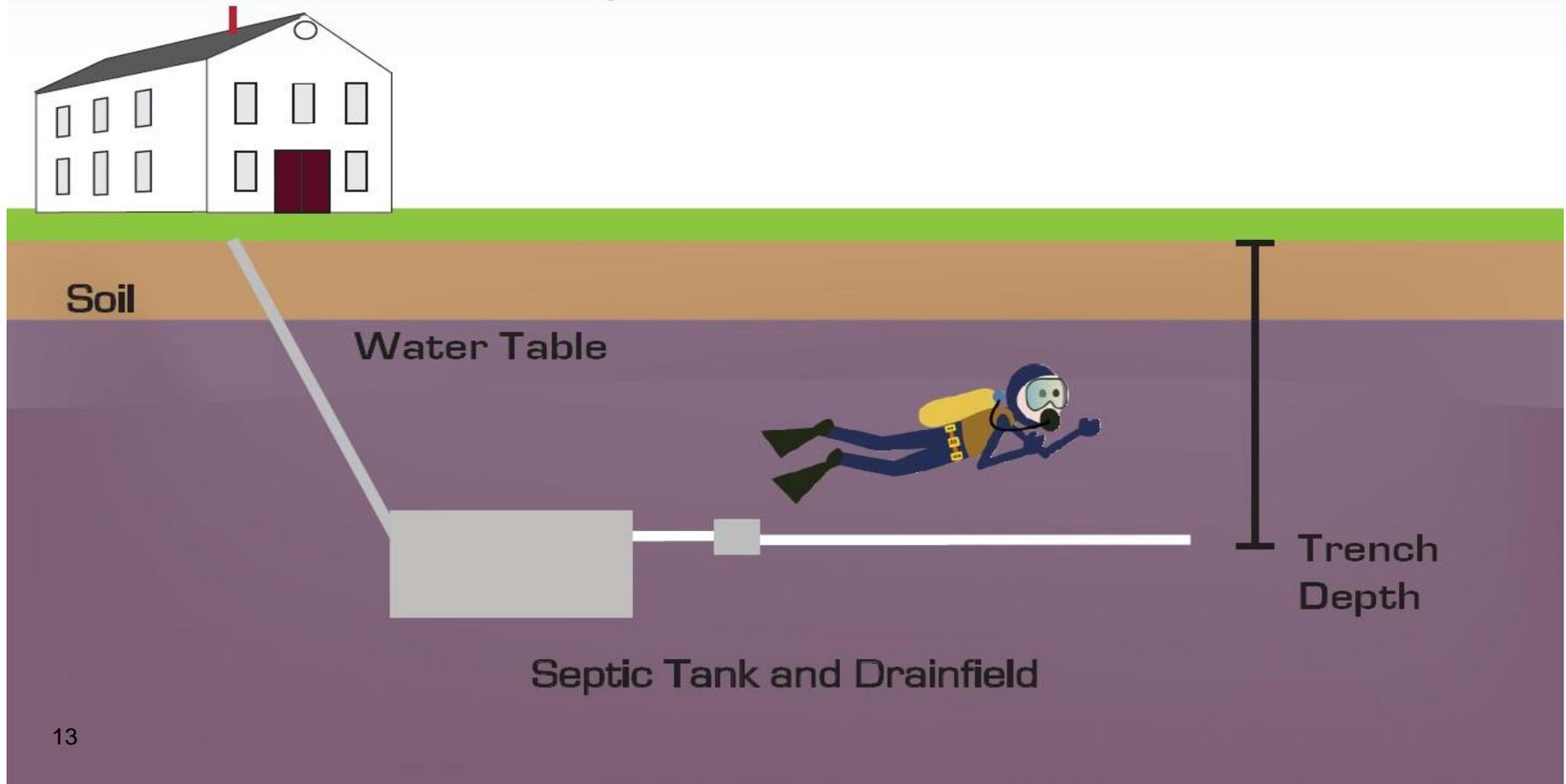
Septic Trenches Penetrate Groundwater

Depth to Seepage Pit or Trench

Community	Average (ft)	Min (ft)	Max (ft)
Matapeake Estates	6	4	8
Normans	10	7	13
Sunny Isle of Kent	8	5	12
Chesapeake Estates	8	4	27
Kentmorr	8	2	22
Queen Anne Colony	10	2	22
Kent Island Estates	8	1	18
Tower Gardens	7	3	15
Romancoke on the Bay	7	3	16

High Groundwater and Septic Trenches

Illustration of Typical Water Table and Trench Depths on Southern Kent



Soils with Poor Permeability

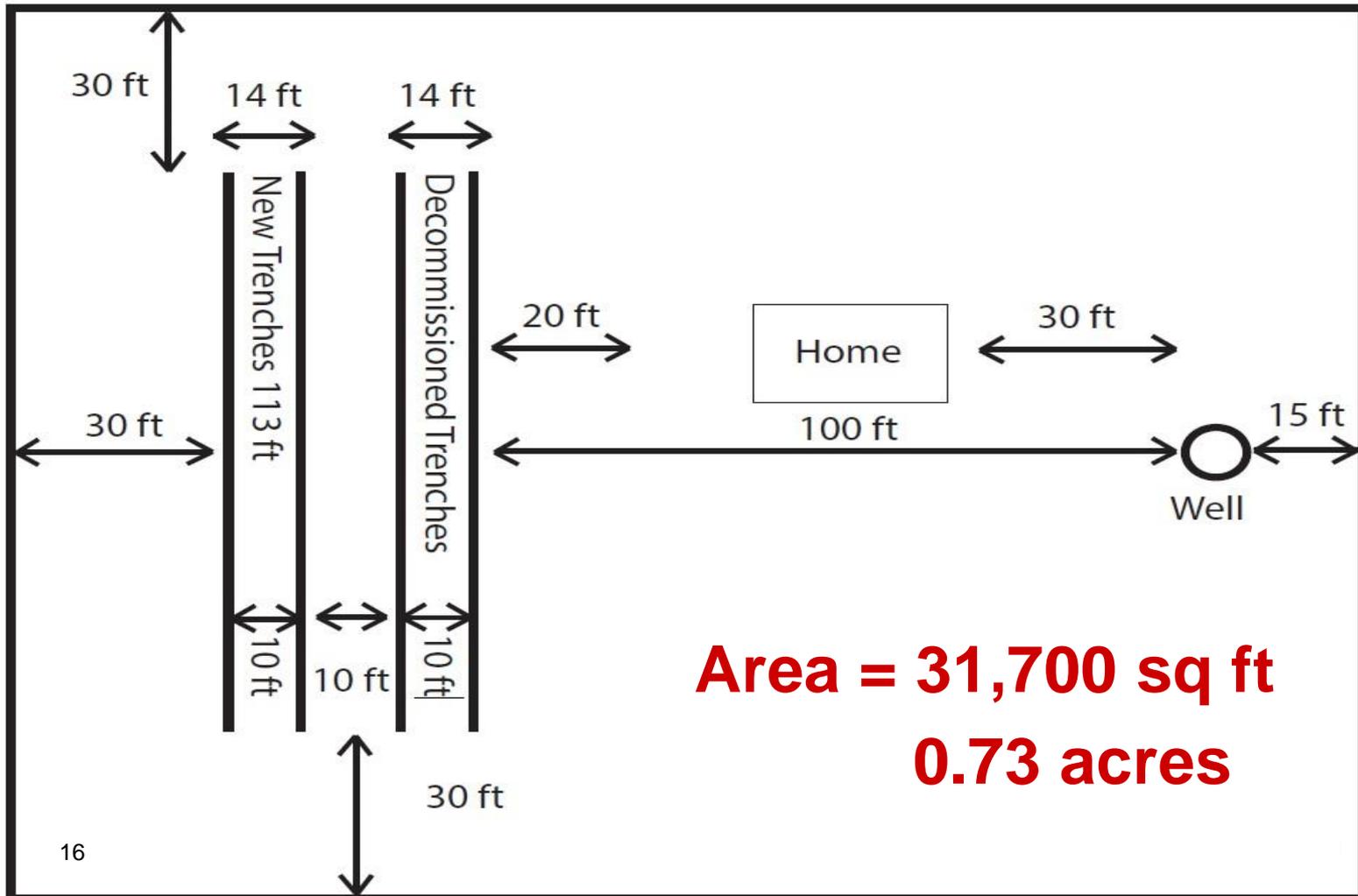


Small Lot Sizes

<u>Subdivision</u>	<u>Average Lot Size (sq ft)</u>
Matapeake Estates	Various lot sizes
Normans	Various lot sizes
Sunny Isle of Kent	9,000
Chesapeake Estates	14,500 - 15,000
Kentmorr	5,000
Queen Anne Colony	20,000 - 25,000
Kent Island Estates	10,000 - 12,000
Romancoke on the Bay	10,000 - 20,000
Tower Gardens	15,000 to 1+ acre

Replacement System Under Ideal Conditions

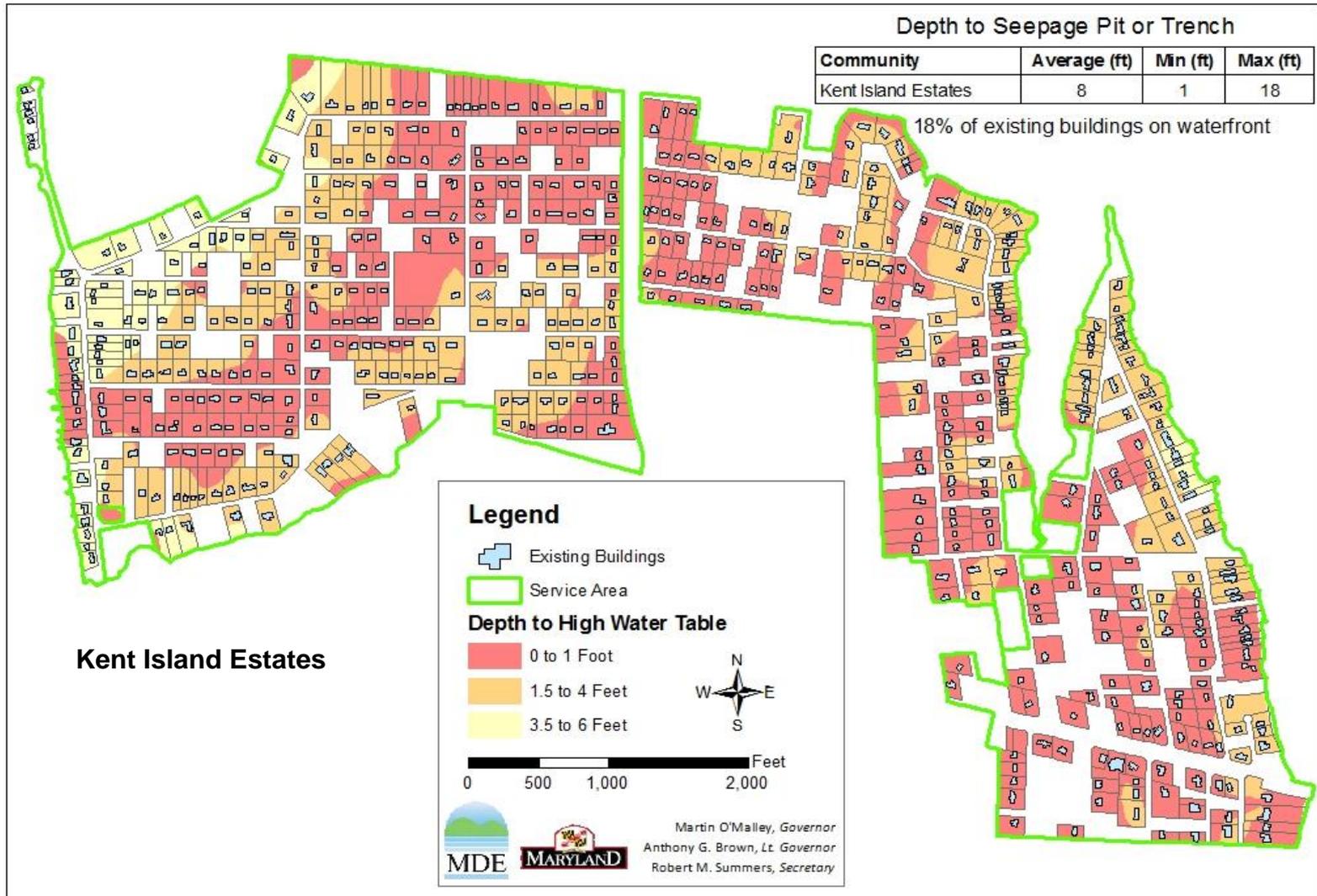
Minimum lot size approximation for the replacement of a sand-lined trench system on Southern Kent Island



Replacement Systems and Lot Sizes

- The minimum area needed for a replacement system under ideal conditions is **31,700 sq ft**
- Most lots on SKI range from 5,000 to 25,000 square feet
- Replacement systems are not an option for SKI

High Groundwater and Small Lot Sizes



- High groundwater
- Soils with poor permeability
- Small lot sizes

3 Strikes and You're Out!

Innovative systems:

- Do not eliminate pathogens
- Do not eliminate the liquid component of the sewage
- Do not reduce nitrogen loads as much as an ENR WWTP

Serving the 9 communities at SKI with the sanitary project will:

- Help prevent future growth
- Provide a cost-effective solution
- Eliminate pathogens
- Provide superior reduction in nitrogen loads



Nitrogen Loads - Existing

EXISTING CONDITIONS – Septic Systems

NITROGEN LOAD - LBS/YEAR

Septic Systems

940 homes - Critical Area	17,446
113 homes - near a stream	1,311
465 homes beyond the Critical Area	3,236
vacant lots	0

Non-point

1,518 homes - 878 acres	6,895
vacant lots - 327 acres	<u>1,528</u>

About 30,400 lbs/yr TOTAL





Nitrogen Loads - Future

FUTURE CONDITIONS – Connect to WWTP

NITROGEN LOAD - LBS/YEAR

ENR

1,518 existing homes on ENR and

560 new homes on ENR

4,987

Non-point

1,518 existing homes - 878 acres and

560 new homes - 327 acres

8,158

About **13,100 lbs/yr TOTAL**



Reduction in Nitrogen Loads

Existing septic and non-point N loads 30,400 lbs/yr

Future ENR and non-point N loads - 13,100 lbs/yr

Reduction in Nitrogen Loads 17,300 lbs/yr



State Revolving Fund (SRF) Loan:

- Approx. \$37 million in capital costs over several years
- 1.5% to 2.0% interest rate
- Up to 30 year loan term
- Assessment on all lots to pay back loan debt
- Vacant lots to pay economic premium of \$25,600 as additional assessment (Co. Resolution 14-07)

Bay Restoration (Septic) Fund Grants:

- County can expect about \$1 million/year through 2030 and \$0.5 million per year thereafter for best available technologies on septic systems to reduce nitrogen.
- County plans to use some of its annual BRF grant (after sewer hookups are completed) to offset existing homeowners' one-time sewer tap fee of \$7,750.
- County plans to use about \$11.83 million in BRF grants over a 40-year time period. MDE & County executed the BRF grant agreement on September 23, 2014.

House Bill 11 of 2014

- HB11 - *Bay Restoration Fund (BRF) – Authorized Uses*
- Departmental bill sponsored by MDE
- Recommendation of the Septics Task Force
- Builds on legislation passed in 2011 (Chapters 492 & 493)
 - *Expands Use* - Can provide grants for connecting septic systems to a WWTP achieving BNR or ENR
 - *Helps Homeowners* – Can apply septic grant toward cost to connect to public sewer
 - *Provides Financial Flexibility* - Can be used for repayment of eligible debt principal amount over time, where septic grant funds are insufficient to finance the entire project

Legislative Conditions to Use Grant:

- Documented environmental problem;
- More cost-effective for nitrogen removal than upgrading septics or replacement not feasible;
- Consistent with comp plan and W&S plan;
- Septic system installed as of October 1, 2008;
- Granted a PFA exception by the SGCC; and
- Consistent with a public health area of concern.
- Denied access for properties outside service area.

Requires MDE to consider:

- Public health issues;
- Potential infill development;
- Measures taken to mitigate the potential impacts of new growth; and
- Total nitrogen reduction from the project, including loading from new growth.

SGCC Conditions:

1. Limited to 1518 existing and no more than 632 currently vacant;
2. County must report annually to MDP number and location of new connections
3. Sewerage capacity for SKI shall not exceed 500,000 GPD
4. Sewer allocation to Kentmorr Marina and other non-residential uses cannot be increased
5. Denial of sewer access for any future connections not in service area
6. County shall conform to 2013 model MD Floodplain Ordinance – minimum 2 feet of freeboard
7. County shall assess climate change vulnerability and outline strategies to enhance resilience



Questions?

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