

# Applicant Guidelines

## Rural Coastal Community Resilience Challenge



**RISE**

**In Partnership With:**



VIRGINIA INITIATIVE FOR  
**GROWTH &  
OPPORTUNITY**  
IN EACH REGION



**Application Deadline: Monday, January 10, 2022, 2pm EST**  
All inquiries should be directed to: [info@riseresilience.org](mailto:info@riseresilience.org)



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# Amendments

Please see the list of changes, as of Feb. 1, 2022

Pg. 6	State Corporation Commission Eligibility: If selected as a winner, an applicant will be required to provide a SCC identification number in April 2022, prior to entering into an award contract. Without a SCC number, no award contract will be executed.
Pg. 7	Timeline: 1/28 – Finalists announced. 2/22, 1pm EST – Deadline to submit the additional documentation. 3/7 – Shortlisted finalists announced. 3/21 – 3/31 – Finalists’ pitch presentations to the Selection Committee. April – Winners selected and announced. May – Launch of the Resilience Innovation Accelerator. Launch of projects implementation.
Pg. 7	Selection Committee Review: The finalists will have until February 22, 2022 1pm EST to submit this additional documentation.
Pg. 12	B. Work Plan/Approach and Detailed/Updated Economic Impact
Pg. 13	The Project Work Plan will have 3 components: 1. Project Overview Narrative 2. Project Work Plan Narrative by Stage 3. Work Plan Workbook with Budget, Schedule, and Milestones
Pg. 14	Project Overview Narrative · Economic Impact: Describe anticipated and other impacts within the Commonwealth of Virginia during and following the end of your project and the timeframe for these outcomes. Please be specific.

## Overview

The impact of climate change is being experienced at an accelerated rate. In the U.S., almost 40% of the population lives in coastal areas vulnerable to sea level rise, leaving these communities at higher risk of flooding, shoreline erosion, and hazards from storms.

With thousands of miles of shoreline, rural coastal Virginia is uniquely vulnerable to coastal storms and flooding associated with tides and extreme precipitation, which are exacerbated by climate change and sea level rise. Exposure to broad rivers and the open waters of the Chesapeake Bay and Atlantic Ocean intensify coastal erosion, risking private property and public infrastructure. Saltwater intrusion is also a threat to well water quality and to coastal farms and forests. The region's heavy reliance on septic systems for wastewater disposal presents both economic and public health challenges.

To address these issues, the RISE Rural Coastal Community Resilience Challenge offers up to \$1.5 million in grants and support services to businesses solving the many problems that face rural coastal communities as a result of climate change. Selected teams will work closely with government, business, academic and tech leaders in coastal Virginia on pilots to validate their innovative solutions across the rural Middle Peninsula region and scale them to other communities.

Rural coastal Virginia presents a rare opportunity: Numerous publicly owned properties and buildings for real-world product testing and development; an unbeatable living laboratory for the best climate resilience and adaptation solutions; and the chance to make a positive impact quickly.

## Challenge Topics

The Challenge seeks businesses with innovative, scalable solutions that address any of the following topics:

 <b>Water Quality Management</b>	 <b>Protection of Buildings and Property</b>	 <b>Flood Management</b>
<ul style="list-style-type: none"><li>• Septic System Design</li><li>• Buildings' Water System Redesign</li></ul>	<ul style="list-style-type: none"><li>• Use and Application of Dredge Material</li><li>• Integrated Coastal Property Design</li><li>• Existing Building Rehabilitation</li><li>• Property Accessibility</li></ul>	<ul style="list-style-type: none"><li>• Living Shoreline Vegetation Production</li><li>• Rural Drainage Improvement</li></ul>

## Winning businesses will get access to:

- Up to \$200,000 USD in non-dilutive grant funding
- Real-world pilot sites in the rural Middle Peninsula region of Virginia
- Feedback from government pilot hosts
- Assistance and support with permitting issues and questions
- University R&D assistance and interns
- Co-working office space in the Middle Peninsula of Virginia
- Fabrication facility in Hampton Roads of Virginia
- Customized business accelerator curriculum
- Government, technical and business mentors
- PR opportunities and media visibility
- Regulatory assistance with government funding
- Introductions to potential investors and customers
- The only ecosystem of coastal resilience entrepreneurs in the U.S.

Project timelines are anticipated to be up to 15 months. Learn more below about solution and applicant eligibility, work the Challenge award can support and the two-part application process.



In  
Partnership  
With:



This Challenge is funded in part by GO Virginia, a state-funded initiative administered by the Virginia Department of Housing and Community Development (DHCD) that strengthens and diversifies Virginia's economy and fosters the creation of higher wage jobs in strategic industries.

## Funding Eligibility

To be eligible for funding and other resources applicants must:

- Be a business entity
- Be registered with the Virginia State Corporation Commission (SCC) and have a SCC number
- Be eligible to receive funds from the Commonwealth of Virginia and adhere to applicable rules and regulations
- Meet goals of the Challenge (see Challenge Topics)
- Deploy the proposed solution in the Middle Peninsula region of Virginia
- Complete the proposed project by June 30, 2023

## Challenge Topic Eligibility

Solutions submitted to the Rural Coastal Community Resilience Challenge must fall within one or more of the three topics:

### Water Quality Management

The Challenge is looking for innovative approaches to the treatment and use of potable, grey, and black water on rural properties. Of greatest importance is to reduce the impact of the occupants on the environment and to limit the effects of the changing climate and sea levels on the ability to occupy and enjoy rural coastal locations. Specific topic areas of interest include:

- Septic System Design
- Buildings' Water System Redesign

### Protection of Buildings and Property

The Challenge is looking for innovative technologies, products and services that introduce new materials, methods, and integrated designs to allow buildings to survive in the coastal environment. Emphasis is placed on protecting and prolonging the lives of existing structures, as well as holistic approaches to the design of new properties. Specific topic areas of interest include:

- Use and Application of Dredge Material
- Integrated Coastal Property Design
- Existing Building Rehabilitation
- Property Accessibility

### Flood Management

The Challenge is looking for innovative flood management solutions for rural coastal communities. Living shorelines are a key component to Virginia's coastal flood protection strategy, and any solution proposed should consider that. In addition, another flooding source is from runoff from the land across the landscape, through ditches and to the bay. Nutrients in this runoff make keeping the stormwater management infrastructure clear of plant growth very challenging. Specific topic areas of interest include:

- Living Shoreline Vegetation Production
- Rural Drainage Improvement

For complete descriptions of each Challenge topic area please refer to pages [17-28](#) at the end of this document. Submissions are not required to meet the needs of only one topic or topic area. In many cases it may be that the solutions proposed meet the needs of two or more of the Challenge topic areas. Although not specifically required, RISE encourages submissions that have this multi-use capability and companies are encouraged to emphasize this in their submission (including the business plan).

Specific topic areas are described for each topic where needs have been identified, however if applicants have solutions outside of these areas, it is recommended that they contact RISE to inquire about their suitability.

## Two types of submissions are permissible in any of the topic areas:

**Design Only** This consists of a design and supporting documents for the solution in question. The design and documentation must be detailed enough to quantitatively assess the technical claims of the design and, if applicable, description of implementation/ installation.

**Design-Build** This consists of a suitable design of the product detailed enough to quantitatively assess the technical claims, as well as a work plan to build, install and demonstrate the solution as part of the award. The award grant will be to execute this work plan. Applicants proposing Design-Build solutions must have a solution at a prototype stage or later when applying to the Challenge.

It is also acceptable for companies to submit submissions that are combinations of Design Only and Design-Build as long as the requirement for each challenge topic area is met.

## Geographic Eligibility

Applicants must demonstrate that the proposed solution may be implemented in and directly benefit the rural Middle Peninsula region in Southeastern Virginia. The Middle Peninsula region includes the counties of Essex, Gloucester, King and Queen, King William, Mathews, and Middlesex, and the incorporated towns of Urbanna, Tappahannock and West Point, and is bordered on the east by the Chesapeake Bay, to the north by the Rappahannock River, and to the south of the York River.

## State Corporation Commission Eligibility

Please note that an applicant is not required to provide a SCC identification number by the Phase 1 application submission deadline on January 10, 2022. However, if selected as a finalist, an applicant will be required to provide a SCC number in April, 2022. Without a SCC number, no award contract will be executed. There is a charge for SCC registration. For more information visit: <https://scc.virginia.gov/pages/Businesses>.

## Timeline

DATE	EVENT
01/10/2022, 2pm EST	Application submission deadline
Every Thursday between November 4, 2021 and January 10, 2022 at 1pm ET	Information webinars
1/28/2022	Finalists announced. Finalists will be required to submit additional including technical details and a detailed work plan.
2/22/2022, 1pm EST	Deadline to submit the additional documentation if selected as a finalist.
3/7/2022	Shortlisted finalists announced and invited to pitch to the Selection Committee.
3/21 – 3/31/2022	Finalists' pitch presentations to the Selection Committee.
April, 2022	Winners selected and announced.
May, 2022	Launch of the Resilience Innovation Accelerator. Launch of projects implementation.
June 30, 2023 – potential extensions TBD	Deadline for projects implementation and contract closeout.

*All dates are subject to change.*

## Selection Process

### Selection Committee Review

Applicants must submit applications no later than **Monday, January 10, 2022, 2pm EST**. The Selection Committee will select finalists to submit additional documentation, including technical details of their solution, a work plan (with budget, schedule, milestones and deliverables), and three-year financial projections. The finalists will have until Feb. 22, 2022, to submit this additional documentation. Once all scores and comments are consolidated, and the technical reviews are complete, the highest scoring finalists will be invited to pitch to the Selection Committee for funding and other resources. After the pitches, the Selection Committee will update all scores and comments and select winners.

### Oral Pitch Presentations

Shortlisted finalists will present their proposed project to the Selection Committee. Finalists will have 30 minutes to present, with an additional 1 hour for questions and discussion from the Selection Committee. Presentations will take place in person at a TBD location in the Middle Peninsula, Virginia or virtually. The finalists will receive questions from the Selection Committee in advance to aid their preparation. Travel will be at the finalists' expense.

## **RISE Resilience Innovation Accelerator**

Winners will receive feedback from the Selection Committee who may recommend making the award (or a portion of the award) contingent upon refinement of a business plan and/or work plan. In such case, the applicant will be offered to participate in a customized RISE Resilience Innovation Accelerator program (Accelerator) that will assist with addressing the Selection Committee's concerns and recommendations.

Each winner will receive up to \$10,000 for their participation in the Accelerator and associated deliverables. If the Committee recommends this course and the applicant, for any reason, decides not to participate, the applicant is free to withdraw from the program at that time with no penalty. Winners are not guaranteed any funding for their pilot projects until they successfully complete the Accelerator (if required by the Selection Committee).

Upon the conclusion of the Accelerator, the Selection Committee will have the option, but is in no way obligated, to negotiate a contract to proceed with a pilot project in response to the Challenge. The final scope of the project will be subject to negotiation based on the findings and refinements from the Accelerator.

## **Evaluation Process**

An application will be evaluated on adherence to these guidelines, including the following criteria and how clearly and completely it provides the information requested:

### **Strength of the Solution & Intellectual Property (30 points)**

- Need addressed & value proposition
- Innovativeness
- Solution stage

### **Business Plan (30 points)**

- Strength of entrepreneurs & management team
- Size of the market and revenue opportunity
- Strength of competitive environment
- Marketing, sales and partners

### **Project Work Plan/Approach (20 points)**

- Relevance to, and advancement towards, business plan goals
- Clarity and quantification of milestones and metrics
- Feasibility
- Costs and timeline reasonableness



## Economic Impact Potential/Economic Benefit to Middle Peninsula and Virginia (20 points)

- Jobs creation and/or retention
- Workforce development
- Benefit to Virginia-based businesses (if an applicant is not a Virginia-based business)

## Appeal Process

The decision of the Selection Committee is final.

## Award

### Grant Funding

The total of up to \$1.5 million in grants and support services is available for solutions in response to this Challenge. Applicants can apply for up to \$200,000 in grant funding. The award amount will be determined by the Selection Committee and the final scope of work will be subject to negotiation. The Selection Committee reserves the right to increase this amount depending on the number of selected projects.

Payments made to grantees under the agreement are made on a reimbursement basis for eligible costs. Grantee must incur costs and request reimbursement for eligible expenses. Reimbursements will be issued only for eligible expenses that are supported by the appropriate documentation and are directly linked to project milestones and deliverables. At a maximum, the grantee will be able to request reimbursement once a month.

All costs charged to the grant shall be supported by properly executed payrolls, time records, invoices, contracts, or vouchers evidencing in proper detail the nature and propriety of the charges. All checks, payrolls, invoices, contracts, vouchers, orders, or other accounting documents pertaining in whole or in part to the grant shall be clearly identified, readily accessible, and separate and distinct from all other such documents.

Payments will be contingent upon successful performance against key milestones and other performance standards outlined in the agreement. The grantee is required to meet the terms of the grant agreement. If the grantee does not meet the agreed upon deliverables, a portion of the entirety of the grant must be repaid. A repayment plan will be determined on a case-by-case basis, with all repayments due by June 30, 2023.

The grantee will be required to repay all or a portion of their grant for any of the following reasons:

- Failure to abide by the terms and conditions set forth in the grant Agreement
- Failure to achieve successful completion of the activity funded by the grant
- Failure to follow any federal, state, or local laws, regulations, and requirements

Depending on the location of awarded pilot projects, grantees will contract with either the Middle Peninsula Chesapeake Bay Public Access Authority (MPCBPAA) or the Middle Peninsula Planning District Commission (MPPDC) for the award. The MPPDC reserves the right to award a sole source contract to the grant recipient, or may award multiple contracts, or none at all.

## **RISE Resilience Innovation Accelerator & Testbed**

In addition to grant funding, Challenge winners will get access to additional resources from the RISE Coastal Resilience Innovation Accelerator & Testbed. The resources are provided in partnership with Virginia Sea Grant, the Middle Peninsula Planning District Commission and the Middle Peninsula Chesapeake Bay Public Access Authority, and include:

- Real-world pilot sites in the rural Middle Peninsula region of Virginia
- Feedback from government pilot hosts
- Assistance and support with permitting issues and questions
- University R&D assistance and interns
- Co-working office space in the Middle Peninsula of Virginia
- Fabrication facility in Hampton Roads, Virginia
- Customized business accelerator curriculum
- Government, technical, and business mentors
- PR opportunities and media visibility
- Regulatory assistance with government funding
- Introductions to potential investors and customers
- The only ecosystem of coastal resilience entrepreneurs in the U.S.

## **Testbed Pilot Sites**

Winners will have unique access to real-world, publicly owned pilot sites administered by the Middle Peninsula Chesapeake Bay Public Access Authority (MPCBPAA). The MPCBPAA leverages over fifty donated coastal and waterfront properties. The waterfront properties are experiencing flooding, erosion, and other impacts of sea level rise - these are perfect and unique conditions to field test resilience innovations. Only 1% of Virginia's coastal land is publicly owned and readily available for coastal resilience and adaptation R&D, which presents an ideal opportunity for businesses developing novel coastal resilience solutions. Please refer to Appendix B for more information about PAA pilot sites available for this Challenge.

## University Consortium Services

In addition to direct funding, winners also gain access to validation and R&D support from area colleges and universities. With vocational community colleges, graduate level institutions and research hubs, the region offers a unique opportunity to provide academic insight and qualified assistance including:

- Assistance to establish and fund a technician-level, Work-Based Learning (WBL) apprenticeship between community colleges and each business to meet workforce needs.
- Assistance to conduct product validation R&D and refinement.
- Students/Faculty to test products, verify performance standards, and recommend further refinements for improvements.
- Environmental characterization to assess the conditions and profiles of the PAA field stations on which innovations will be implemented, and to help determine adaptation success of the implemented product.

## Eligible Uses and Costs

Support for the Challenge comes from the Commonwealth of Virginia. Solutions funded by the Challenge must meet Commonwealth of Virginia funding regulations and requirements. Based on the requirements of these funds, the following uses are examples of eligible funding uses:

- Purchase of fixed assets, working capital, salaries, and technical assistance to businesses
- Prototype, planning, drafts, versions, and proof-of-concept development created prior to a final product
- Installation and testing of prototype, or installation of pilots on publicly-owned property
- Recruitment and workforce development activities,
- Creation of plans, reports, or similar deliverables aimed at providing lessons learned, guidance, and best practices
- Acquisition or rental of machinery, equipment or services if integral to the proposed project, program or plan
- Administrative costs related to servicing or ensuring compliance with grant requirements
- Payments for salaries and support of staff or the contracting of an outside entity to implement any part of the project, program, or a plan
- Preparation of financial packages, survey, engineering, legal, architectural or other similar assistance if integral to the proposed project, program, or a plan
- Expenses related to business recruitment, marketing, promotional activities, and related administrative expenses, including, but not limited to, salaries, travel, office expenses, advertising, legal and related cost
- For construction projects, applicants will be required to demonstrate that their project is feasible. This is satisfied if a registered professional engineer (or other design professional) certifies that the design meets the appropriate code or industry design and construction standards



Any equipment purchased with grant funds will have a lien/security interest for the duration of the grant agreement. The equipment must be physically located in Virginia.

## Application Submittal Requirements

### Application Submission

Application process is divided into two phases: Phase 1 application shall be submitted online at F6S platform: [www.f6s.com/ruralresiliencechallenge](http://www.f6s.com/ruralresiliencechallenge). Proposals may be started at any time and can be edited until the submission deadline of Monday, January 10, 2022 at 2:00pm EST. Timely submission of the proposal is solely the responsibility of the applicant. Proposals received after the specified date and time will not be accepted.

### Phase 1 application includes the following components:

- A. Executive Summary & Company Background
- B. Solution Overview
- C. Business Plan
- D. Economic Impact
- E. Pilot Site Needs
- F. References

Following a review of Phase 1 applications, the Selection Committee will select finalists to submit additional details using an online Phase 2 application. Finalists will receive a link to upload additional documentation including:

- A. Detailed/Updated Business Plan
- B. Work Plan/Approach and Detailed/Updated Economic Impact
- C. Technical Approach

Specifically, the additional documentation should include:

### A. Detailed/Updated Business Plan

The Business Plan demonstrates what is going to sustain and grow the business once the project is complete. Applicants must upload the latest version of the Business Plan for their venture that answers all of the questions below:

1. A statement of the problem you are solving, and a description of your solution

2. A description of the business model(s)
3. 3-year financial projections of revenues and expenses, as well as cash flows
4. Marketing plan for the solution
5. Schedule for the overall business plan
6. Major milestones for the solution beyond RIF award
7. An organizational chart
8. A description of partnerships with other organizations and individuals
9. Team resumes
10. A description of the market for the solution, customers, and beneficiaries
11. Value proposition of the offeror's solution to the buyer and rationale for why a buyer would purchase
12. Anticipated market penetration at the end of CY 2022, 2023 and 2024
13. Alternatives to the offeror's solution that are currently available in the market
14. Description of active competitors delivering a similar solution
15. A description of obstacles that may be encountered when trying to enter the market with this product/service
16. A description of intellectual property (IP) protection

Other key information that is key to understand the market for the solution and how the team will capitalize on the solution

The Business Plan should be a maximum of 15 pages.

## **B. Work Plan/Approach**

The Project Work Plan will have three components:

1. Project Overview Narrative
2. Project Work Plan Narrative by Stage
3. Work Plan Workbook with Budget, Schedule, and Milestones

Applicants should break down the proposed project into a series of stages, each with measurable objectives and deliverables to create the Project Work Plan narrative. Each stage must advance the effort toward the overall goals in a measurable and meaningful way, clearly demonstrating an advancement of the project.

### **1. Project Overview Narrative**

The Project Overview should include the following in narrative form:

- Overall technical goal(s) and strategies for the project, including an explanation of how the entity is achieving the project goal(s) and will advance the goal(s) outlined in the Business Plan.

- The critical accomplishments, deliverables, or achievement points over the duration of the award.
- Anticipated permit requirements of the locality and other authorizing jurisdictions that will be required for project.
- Period of performance for project, as well as a description of current related efforts and work that may extend beyond the expenditure timeline.
- For Construction Projects only: Attach existing feasibility studies or reports. If no existing studies are available, please include feasibility study in timeline.
- Economic Impact: Describe anticipated and other impacts within the Commonwealth of Virginia during and following the end of your project and the timeframe for these outcomes. Please be specific.

## 2. Project Work Plan Narrative by Stage

- Name of stage.
- Description of tasks to be performed.
- Key personnel working on the tasks and description of qualifications of the team (principal, key personnel, subcontractors and consultants) to execute the stage of the Work Plan.
- Milestones of each stage.
- Deliverables/objectives and measurable criteria to determine that the deliverables/ objectives have been met/ achieve.
- Schedule of each stage.

## 3. Project Work Plan Workbook

The Project Work Plan Workbook will have the following components (required template will be made available prior to inviting Phase 2 applications).

- Total budget with line items.
- Milestones by quarter through the expenditure period (expenditure deadline is June 30, 2023).

## C. Technical Approach

Technical report(s), and/or presentation describing your solution in further detail from a technical perspective.

## **Proprietary Information/Non-Disclosure & IP Ownership**

All application materials are considered confidential. Applicants and grantees will retain ownership of intellectual property.

## **Cost Incurred in Responding**

This solicitation does not commit the Challenge partners to pay any costs incurred in the preparation and submission of proposals or in making necessary studies or designs for the preparation thereof, nor to procure or contract for services.

## **No Requirement of Award; Non-commitment**

Notwithstanding any other provision of this document to the contrary, the Challenge does not commit the MPPDC and the MPCPAA to award any funding to any applicant. The Selection Committee reserves the right to reject any and all applications or any portions thereof, at any time, and to cancel the Challenge and to request new applications under a new Challenge or other vehicle.

## **Other Terms & Conditions**

### **Reporting**

As a condition of the grant, grantees are required to submit a monthly progress report(s) and final report discussing project and financial performance. Grantees are required to briefly report on commercialization and/or other outcomes and impact annually for three years after the period of performance.

### **Monitoring and Oversight**

Each funded applicant will be monitored throughout the lifetime of their grant. Monitoring serves to identify risks and deficiencies early in the process, so that any issues may be remedied at the outset.

In general, the levels of monitoring range from desk auditing, to on-site monitoring, to integrity monitoring. Any risks and deficiencies identified result in a request for timely corrective action from the entity being monitored. The grantee will be provided technical assistance in order to facilitate compliance with applicable federal, state, and local regulations.

## Insurance

The grantee is required to have the following insurance coverage before commencing any work in the Middle Peninsula region. For construction projects, if any subcontractors are involved, the subcontractor will have workers' compensation insurance in accordance with 2.2-4332 and 65.2-800 et seq. of the Code of Virginia. The grantee further certifies that the contractor and any subcontractors will maintain these insurance coverages during the entire term of the contract and that all insurance coverage will be provided by insurance companies authorized to sell insurance in Virginia by the Virginia State Corporation Commission.

Depending on the location of pilot projects, Middle Peninsula Chesapeake Bay Public Access Authority (MPCBPAA) or the Middle Peninsula Planning District Commission (MPPPDC) must be named as an additional insured on the insurance certificate reflecting Commercial General Liability and other insurance coverages.

## Minimum Insurance Coverages and Limits

1. Workers' Compensation - Coverage is compulsory for employers of three or more employees, to include the employer. Grantees who fail to notify the MPCBPAA or MPPPDC of increases in the number of employees that change their workers' compensation requirements under the Code of Virginia during the course of the contract shall be in noncompliance with the contract.
2. Employer's Liability - \$100,000.
3. Commercial General Liability - \$1,000,000 per occurrence and \$2,000,000 in the aggregate. Commercial General Liability is to include bodily injury and property damage, personal injury and advertising injury, products and completed operations coverage.
4. Automobile Liability - \$1,000,000 combined single limit. (Required only if a motor vehicle not owned by the Commonwealth is to be used in the contract.)

## Profession/Service and Limits

Architecture	\$1,000,000 per occurrence, \$3,000,000 aggregate
Landscape/Architecture	\$1,000,000 per occurrence, \$1,000,000 aggregate
Professional Engineer	\$1,000,000 per occurrence, \$3,000,000 aggregate
Surveying	\$1,000,000 per occurrence, \$1,000,000 aggregate

## State Corporation Commission Certification

Pursuant to Code of Virginia § 2.2-4311.2(b), a proposer organized or authorized to transact business in the Commonwealth is required to include in its proposal the identification number issued to it by the State Corporation Commission (SCC). Any proposer that is not required to be authorized to transact business in the Commonwealth as a foreign business entity under Title 13.1 or Title 50 or as otherwise required by law is required to include in its proposal a statement describing why the proposer is not required to be so authorized.

## Detailed Challenge Topic Descriptions

The Challenge topics areas described below are developed around technical areas of interest to the community. Submissions are not required to meet the needs of only one topic or topic area. In many cases it may be that the solutions proposed meet the needs of two or more of the Challenge topic areas. Although not specifically required, RISE encourages submissions that have this multi-use capability and companies are encouraged to emphasize this in their submission (including the business plan).

Specific topic areas are described for each topic where needs have been identified, however if applicants have solutions outside of these areas, it is recommended that they contact RISE to inquire about their suitability.

Two types of submissions are permissible in any of the topic areas:

- Design only** This consists of a design and supporting documents for the solution in question. The design and documentation must be detailed enough to quantitatively assess the technical claims of the design and, if applicable, description of implementation/installation.
- Design-Build** This consists of a suitable design of the product detailed enough to quantitatively assess the technical claims, as well as a work plan to build, install, and demonstrate the solution as part of the award. The award grant will be to execute this work plan. Applicants proposing design-build solutions must have a solution at a prototype stage or later when applying to the Challenge.

In both cases submissions must also contain a detailed business plan including the details described earlier in this Applicant Guidelines document. If the enterprise will be using the Chesapeake Bay Watershed Nutrient Credit Program, this process should also be described in detail including any assistance (e.g., permitting, regulatory compliance, etc.) required from RISE and its partners.

It is also acceptable for companies to submit submissions that are combinations of Design only and Design-Build as long as the requirement for each challenge topic area is met.



## Water Quality Management

RISE is looking for innovative approaches to the treatment and use of potable, grey, and black water on rural properties. Of greatest importance is to reduce the impact of the occupants on the environment and to limit the effects of the changing climate and sea levels on the ability to occupy and enjoy rural coastal locations.

**Below are two areas of interest related to Water Quality Management, and specific problems in need of solutions:**

### 1) Septic System Design

#### The Problem(s)

Due to the lack of main sewer systems, many properties in rural areas manage (grey/black water) waste using septic systems. The occurrence of septic system failures is an increasing concern among residents of Virginia's rural coastal communities and their local government leaders. The prevalence of sea level rise, land subsidence, and recurrent flooding in coastal Virginia make the region particularly susceptible to septic system failures as compared to other parts of the Commonwealth.<sup>1</sup> The Virginia Department of Health has estimated that there are over 104,000 onsite sewage systems in Virginia's Middle Peninsula, Northern Neck and Eastern Shore.<sup>2</sup>

The failure of conventional septic systems in rural coastal Virginia threatens public health and water quality. This Challenge is seeking innovative, cost-effective solutions that can withstand the environmental conditions of rural coastal Virginia and produce clean water that passes all public health standards. The Pain Points in Current Solutions

Some parts of the Middle Peninsula are already less than three feet in elevation above mean sea level ("MSL"), and in the next 30 years, the entire area will be less than three feet above MSL. A conventional septic system needs at least 18 inches from the bottom of the trench to a water table. The total depth of the trench (18 inches) plus the vertical separation provides three feet of unsaturated soil above the water table, which is required for a conventional septic system to function properly.

When a conventional septic system is impractical or impossible, homeowners can utilize alternative systems, many of which are already permitted and available in Virginia.

Even with the plethora of alternative systems available in Virginia, long-term, viable options are lacking for some sites in rural coastal Virginia. Many sites are subject to recurrent flooding, so the upkeep and maintenance of alternative systems become inefficient and cost prohibitive. Even for sites that do not experience recurrent flooding, existing alternative systems may be impractical for homeowners due to the higher cost as compared to a conventional septic system.

<sup>1</sup> Septic Reference Guide for VCPC\_82695136\_3.pdf

<sup>2</sup> "HB 2322: Plan to Transition Septic Pump Out Oversight and Enforcement in Rural Coastal Virginia", November 2020, Virginia Department of Health, Office of Environmental Health Services

One potential solution to the problem of failing septic systems in rural coastal Virginia is to elevate the treatment tank above ground to protect it from the damaging effects of recurrent flooding, sea level rise and inclement weather. An elevated treatment tank would likely also require an elevated drainfield. Elevated drainfields are currently permitted in Virginia, but an elevated treatment tank has not yet been implemented or permitted. Elevating the treatment tank is a novel approach without any current regulatory requirements that would preclude this design.

One issue with an elevated system is that it may require pumps which in turn rely on electrical power. When the power is interrupted the system may not function as it should. Many property owners address this (and other issues from power outages) by purchasing a gas generator (typical cost approximately \$800).

**RISE is seeking both in-ground and elevated systems solutions.**

**If the proposed system is an in-ground (conventional or alternative system) it must:**

- Be either retrofitted or a new installation
- Function in a high-water table environment
- Be able to secure permit under current regulations

**If the proposed solution has an elevated treatment tank it must:**

- Function for up to 72 hours after main power is interrupted
- Be protected against severe environmental/meteorological conditions

**Also, optional but preferred attributes for an elevated system:**

- Can provide up to 6500W continuous power for up to 72 hours at 120 VAC for household use
- Can recycle some or all of the discharge water for home reuse in accordance with regulatory guidelines (see **Buildings' Water System Redesign** below).

Solutions that consider single or multiple connected homes may be considered.

**Additional Information Available Upon Request**

- "Septic Reference Guide for the Virginia Coastal Policy Center", Jessica Kirkland, Nov 30, 2020. Available upon request.
- [Virginia Pollutant Discharge Elimination System \(VPDES\)](#)
- [Virginia Department of Environmental Quality](#)
- HB 2322: Plan to Transition Septic Pump Out Oversight and Enforcement in Rural Coastal Virginia, November 2020. Available upon request.

## 2) Buildings' Water System Redesign

### The Problem(s)

Wells that provide properties with potable water are experiencing saltwater intrusion. Often a property will need a second well to provide sufficient drinking water. There is a need for more holistic, closed or partially closed systems that more efficiently and cost effectively utilize fresh water, grey water, and saltier water for all the purposes water is needed in a home.

This Challenge will demonstrate new approaches to reassessing buildings' water needs providing solutions that reduce the use of potable well water, while maximizing the uses of other sources of water.

Solutions to this Challenge may incorporate solutions from [Septic System Design](#) above.

### The Pain Points in Current Solutions

Often reduced or degraded flows from wells struggle to provide proper potable water levels for a building's daily consumption. The correction to this is to drill another well head, which can be expensive, and another possible pathway to well contamination from bacteria or saltwater. There is no acceptable way of including the potential reuse of grey water to reduce the burden on potable water. A holistic water solution for a house is required instead of relying solely on well water.

### RISE is seeking new systems (replumbed house) that:

Provide habitants with sufficient fresh potable water for daily consumption and use, and reuse grey water to limit discharge to (already wet) property, and potentially find uses for saltier water to save potable water.

#### Some solutions may be:

- Integrated and permittable system of fresh, grey, and other water sources for use in a building's operations.
- Development of localized water processing capabilities: desalinization, purification, recycling, etc.

Solutions must be sustainable, affordable, and permittable under current regulations. Solutions that consider single or multiple homes may be considered.

### Additional Information Available Upon Request

- "Septic Reference Guide for the Virginia Coastal Policy Center", Jessica Kirkland, Nov 30, 2020 (available upon request).
- [Virginia Pollutant Discharge Elimination System \(VPDES\)](#)
- [Virginia Department of Environmental Quality](#)
- HB 2322: Plan to Transition Septic Pump Out Oversight and Enforcement in Rural Coastal Virginia, November 2020 (available upon request).



## Protection of Buildings and Property

RISE is looking for innovative technologies, products and services that introduce new materials, methods, and integrated designs to allow buildings to survive in the coastal environment. Emphasis is placed on protecting and prolonging the lives of existing structures, as well as holistic approaches to the design of new properties.

**Below are four areas of interest related to Protection of Buildings and Property, and specific problems in need of solutions:**

### 1. Use and Application of Dredge Materials

#### **The Problem(s)**

There are currently multiple dredging projects underway in the Middle Peninsula waterways to maintain and improve the navigability of the Chesapeake Bay. The Middle Peninsula Planning District Commission and the Eastern Shore has close to \$20 million in “shovel-ready” dredging projects in the queue for execution. Currently there are smaller deposits in the region, however in the future these projects will yield an enormous amount of material that must be accommodated on land close to the dredging projects.

This Challenge will re-imagine how the dredging materials may be used in economically sustainable ways to address the resilience needs of the community and region.

#### **The Pain Points in Current Solutions**

The dredging material is generally permitted for onshore storage, which can be unsightly and a poor use of municipal and private land. Transportation of the material can be expensive. To date, no economically viable uses or applications in Virginia have been found for the material to reduce the stockpiles.

Rural dredge material is of known composition and is not considered to be toxic. However, the composition may include nitrogen and phosphorus, which qualify for the nutrient credit program.

#### **Solutions Being Sought**

RISE is seeking solutions to use the dredging materials in ways to mitigate local flooding threats in the special flood hazard area and/or enhance the region's resilience in other beneficial ways.

#### **Some examples may be:**

- Building materials
- Roadway materials (for paving, elevation, etc.)

- Uses of stockpiles of dredge materials in resilience-building or resilience-related applications and are financially sustainable
- Use of the material to expand/enhance living shoreline or other nature-based and hybrid solutions

Other uses (e.g., non-flooding related construction outside of the special flood hazard area) may be considered as part of the business model or plan, but those applications cannot be piloted using this Challenge funding.

Dredging materials can be made available for companies (upon request) wanting to use it for their projects.

### **Additional Information Available Upon Request**

Reports on composition of local dredge materials available upon request.

## **2. Integrated Coastal Property Design**

### **The Problem(s)**

Most coastal properties designed with resilience solutions from the water to the buildings are developed in a piecemeal fashion using a series of accepted practices. The solutions are designed and implemented to work individually but not together. Greater integration of home and building design could enhance resilience and sustainability, leading to novel waterfront properties - from the bay to the building - that can withstand sea level rise.

This Challenge seeks new approaches to the design, integration, and implementation of resilience solutions integrating shoreline, landscape, and building designs. Demonstrations may use an available network of publicly owned waterfront properties (residential structures and/or vacant parcels of land) as R&D test sites.

### **The Pain Points in Current Solutions**

Designing new structures for future flooding conditions has been a focus of many efforts, but the results have not always been applied to rural communities. Affordability and permitting issues often preclude new approaches.

It is often difficult to measure and assess the effectiveness of a new design, which, in turn can make optimization challenging. There may be a need to employ sensors and data analytics to measure and demonstrate design performance. These data sources and analysis may also inform when a building must be moved from its existing location. Getting adequate warning of this will help the homeowner and community plan ahead.

## Solutions Being Sought

RISE is seeking affordable and permittable solutions for demonstration that:

1. Designs that integrate living shoreline, landscape, and buildings, incorporating green and blue infrastructure with novel building materials.
2. Designs that more effectively live with water and drive toward net zero energy and carbon encumbrance.
3. Measure and monitor the effectiveness of the design, smart system technology.

## Additional funding available

Also, the Middle Peninsula Planning District Commission (MPPDC) has an additional \$800,000 [Virginia Housing and Development Authority \(VHDA\) grant](#) to be used to purchase completed residential homes that can be moved into by June 2024. These residential units must:

- be built on Public Access Authority property
- have an installed and functioning well access for potable water
- have an installed and functioning septic system
- consist of a residential building with a Certificate of Occupancy

At this time, it is estimated that each unit would be bought for up to \$80,000 (subject to revision). Each qualifying company may qualify to sell one or more units. Land for these units will be provided at no cost. This funding and its award will be administered by the MPPDC at its sole discretion. This will be discussed further in upcoming webinars.

## Additional Information Available Upon Request

- [Living Shoreline definitions, Virginia Marine Resources Commission](#)
- <https://vhdagrants.com/insideLinkOpps.jsp?documentPk=1617118530127>

## 3. Existing Building Rehabilitation

### The Problem(s)

Many existing coastal homes and properties are vulnerable to inundation from flooding and sea level rise impacts, including access to the property. To extend their useful lifecycle, beyond 15 years, many buildings require rehabilitation to make them habitable and more resilient to flooding.

This Challenge seeks new cost effective, innovative, solutions to make current residential and commercial structures resilient (viable and habitable) to flooding and sea level rise for 15 years or more.

## **The Pain Points in Current Solutions**

Best practices on preparing existing buildings before flooding or adapting existing buildings after flood damage for rural properties are not widely applied or known.

Designing new structures for future flooding conditions has been a focus of many efforts, but the results have not always been applied to rural communities.

## **Solutions Being Sought**

RISE is looking for the following solutions for existing buildings:

- Building enhancements that will prepare a structure for flooding events and/or to minimize the amount of time it will be out of service after an event
- Building mitigations (or mitigation practices) to repair structures after flooding events to allow it to return to use and minimize the effects of future flooding events.

## **4. Property Accessibility**

### **The Problem(s)**

In the Middle Peninsula region, private roads connecting buildings to public roadways are affected by flooding conditions limiting property access and effectively isolating the home. When these roads are impassable, private property owners are unable to access their properties and public services (e.g., fire, ambulance, school buses, etc.) are blocked from residents.

Building new or elevating existing roads are time consuming and costly propositions. Altered roads (material, structure, elevation) or alternatives to roads are required to provide consistent access to properties during flooding events for a defined duration.

### **The Pain Points in Current Solutions**

Building new or elevating existing roads are time consuming and costly propositions. Altered roads (material, structure, elevation) or alternatives to roads are required that provide consistent access to properties during flooding events for a defined duration.

### **RISE is seeking cost-effective, innovative solutions that:**

Provide reliable and consistent, but short-term (~10 - 15 years) accessibility to properties currently impacted by flooding and sea level rise.

**RISE is seeking cost-effective, innovative solutions that:**

Provide reliable and consistent, but short-term (~10-15 years) accessibility to properties currently impacted by flooding and sea level rise.

Solutions for this topic may take advantage of solutions to **Use and Application of Dredge Materials above.**

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<sup>3</sup> <https://www.governor.virginia.gov/media/governorvirginiagov/governor-of-virginia/pdf/Virginia-Coastal-Resilience-Master-Planning-Framework-October-2020.pdf>

<sup>4</sup> <https://law.lis.virginia.gov/vacode/28.2-104.1/>

<sup>5</sup> <https://law.lis.virginia.gov/vacode/title58.1/chapter36/section58.1-3666/>



## Flood Management

RISE is looking for innovative approaches to realizing flood management solutions for rural coastal communities. Living shorelines are a key component to Virginia’s coastal flood protection strategy, and any solution proposed should consider that. In addition, another flooding source is from runoff from the land across the landscape, through ditches and to the bay. Nutrients in this runoff make keeping the stormwater management infrastructure clear of plant growth very challenging.

**Below are two areas of interest related to Flood Management, and specific problems in need of solutions:**

### 1. Living Shoreline Vegetation Production

#### **The Problem:**

Nature-based approaches such as strategic land conservation, wetland restoration, and living shorelines have greater potential to address water quality and to aid in flood management solutions in rural coastal Virginia.<sup>3</sup> They also protect shorelines from erosion by absorbing wave energy.

“Living shoreline” means a shoreline management practice that provides erosion control and water quality benefits; protects, restores, or enhances natural shoreline habitat; and maintains coastal processes through the strategic placement of plants, stone, sand fill, and other structural and organic materials. When practicable, a living shoreline may enhance coastal resilience and attenuation of wave energy and storm surge.<sup>4</sup> The Middle Peninsula Planning District Commission (MPPDC) manages a Living Shoreline Incentive Program, (LSIP), a low interest loan and grant program available to residents seeking to install living shorelines on their property. Living shorelines are also Tax Exempt by statute.<sup>5</sup>

Production of sufficient plants for this need throughout Virginia’s coastal region is beyond current farming resources. For example, one living shoreline project MPPDC is working on requires more than 65,000 plants. There are over 1,000 miles of shoreline in Virginia that could require living shoreline applications in Virginia alone.

This Challenge will demonstrate approaches to sustainably provide (produce and transport) vegetation for living shorelines being implemented in rural coastal communities.

#### **The Pain Points in Current Solutions**

In rural coastal Virginia, nurseries are generally growing plants that exist in freshwater non-floodplain environments. Access to valuable wetlands to grow plants is difficult. The Virginia Coastal Resilience Master Plan is increasing demand for nature-based solutions which, in turn, is exacerbating the bottleneck. For other coastal locations, this will be a limiting problem too.

## Solutions Being Sought

RISE is seeking solutions to living shoreline vegetation production that:

Identify suitable plants for local living shoreline implementations as well as sustainable means of production and transportation.

1. Identify suitable plants for local living shoreline implementations as well as sustainable means of production and transportation.
2. Identify new plants (and/or existing species that need to be farmed more widely) and/or production methods for living shoreline vegetation.
3. Demonstrate new business models to ease the bottleneck that vegetation production introduces in living shoreline implementations region-wide and scalable to other coastal states.

## Additional Information Available Upon Request

- [Living Shoreline definitions, Virginia Marine Resources Commission](#)
- The Living Shoreline [Group 1](#) and [Group 2](#) General Permits.
- [USACE publications](#)
- [FEMA Nature-based Solutions](#).

## 2. Rural Drainage Improvement

### The Problem(s)

Drainage and maintenance of roadside ditches is a major struggle for rural coastal communities. Current ditch designs rely on gravity for flow, which does not work in many rural coastal communities at low elevation. In addition, nutrients in run-off lead to ditches becoming overgrown, requiring greater maintenance to keep them working.

Ditches need enhanced water flow to let the land dry thereby preserving the property value. Without suitable drainage, a community may see significant losses in taxable property values. For example, between 2010-2016, Mathews County received approximately \$6M in FEMA Hazard Mitigation Grants to elevate homes damaged from storms<sup>6</sup>, and lost \$75M in taxable property value in their last assessment.

This Challenge will re-imagine rural stormwater management and drainage systems.

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<sup>6</sup> Hubbard, F. December 26, 2016. Mathews shoreline threatened while officials debate planning. Daily Press <https://www.dailypress.com/news/gloucester/dp-nws-evg-sea-level-mathews-20161223-story.html>

## The Pain Points in Current Solutions

There are current drainage solutions, including roadside ditches, in place in the Middle Peninsula region, and there have been for many years. These public roadside ditches are maintained by the Virginia Department of Transportation, which is a cost to them in manpower, time, and expense.

Rainfall runoff produces flooding due to poor drainage, and results in nutrients running off the surrounding landscape. This runoff can also reach the Chesapeake Bay. Tidal backflow can produce flooding as water from the bay flows into the drainage system at high tides.

### Some of the problems with these current solutions are:

- Zero grade stormwater ditch system often has standing water - low/no flow and reduced capacity resulting in poor drainage and flood prevention.
- These ditches are also expensive to maintain and clean.
- Tidal backflow into the drainage system results in further flooding introducing brackish or saltwater.
- There are levels of nitrogen and phosphorus in the runoff and soil - damaging ditches and being introduced into the Chesapeake Bay.

### RISE is seeking innovative solutions that:

1. Are effective in low/zero grade environments thereby mitigating local flooding threats and enhance the region's resilience.
2. Protect properties from flooding produced by tidal backflow.
3. Reduce nutrient runoff being deposited in the bay.
4. Reduce maintenance and operation costs incurred by Virginia Department of Transportation, municipalities and/or governments.

This Challenge topic requires a **Design-Build** solution. Successful awardee(s) will be required to build, install, and demonstrate their solutions.

## Appendix 1 - Supporting Documents and Resources

### The Chesapeake Bay Watershed Nutrient Credit Program

The Virginia General Assembly has found that a market-based nutrient credit program will assist in achieving the Chesapeake Bay Program's reduction goals of nitrogen and phosphorous.<sup>7,8</sup> Not only will this encourage water quality improvements in the Chesapeake Bay watershed, but by accumulating and trading nutrient credits, companies may be able to generate revenue streams to support and enhance their business models. More details can be found in the links below<sup>1,2</sup>. RISE may be able to assist companies in finding answers to questions that will help companies clarify their opportunities under this program in the context of their submissions to this Challenge Competition.

### Permitting and Regulatory Support Services

Companies submitting to the RISE Rural Coastal Community Resilience Challenge may require assistance in getting answers to specific questions in permitting and associated issues. Such questions arising should be submitted to at any time in the submission process. RISE and its partners will assist the companies in finding the necessary government/regulatory contacts and/or information.

### The Middle Peninsula Chesapeake Bay Public Access Authority (MPCBPAA)<sup>9</sup>

The Public Access Authority recognizes that shorelines are high priority natural areas and that it is critical to set aside access sites for all types of activities important to the local economy and to the citizens of the Commonwealth of Virginia. The MPCBPAA has access to numerous waterfront (and other) properties that can be used as test-sites for companies' projects. Details of the properties can be found online<sup>10</sup>. If companies have specific needs or request for information on the properties, they should contact RISE and its partners with those enquiries at any point in the submission process.

### Go Virginia Coastal Resilience & Adaptation Economy Region 6 Action Plan

The Middle Peninsula has published a document outlining its goals, needs, and activities in resilience and adaptation.<sup>11</sup> This document is an important basis for understanding the needs and priorities of the community (and other coastal rural communities).

### Virginia Coastal Resilience Master Planning Framework

The Commonwealth of Virginia has published a Framework that lays out the core principles of its approach to coastal adaptation and protection, and the process by which the Commonwealth will develop and begin implementing Virginia's first Coastal Resilience Master Plan by the end of 2021.<sup>12</sup>

<sup>7</sup> <https://law.lis.virginia.gov/vacodefull/title62.1/chapter3.1/article4.02/>

<sup>8</sup> <https://www.epa.gov/chesapeake-bay-tmdl/trading-and-offsets-chesapeake-bay-watershed>

<sup>9</sup> <https://mppdc.com/index.php/pdcinfo/mppdc>

<sup>10</sup> <https://mppdc.com/index.php/service-centers/coastal/paa>

<sup>11</sup> [https://vaseagrant.org/wp-content/uploads/GoVA\\_ActionPlan2021\\_WEB.pdf](https://vaseagrant.org/wp-content/uploads/GoVA_ActionPlan2021_WEB.pdf)

<sup>12</sup> <https://www.governor.virginia.gov/media/governorvirginiagov/governor-of-virginia/pdf/Virginia-Coastal-Resilience-Master-Planning-Framework-October-2020.pdf>