



**JBLE- Eustis, Virginia**

**2023 – 2028**

**Bacteria Total Maximum Daily Load (TMDL) for Warwick River  
Action Plan**

**For**

**Virginia General Permit for Small Municipal Separate Storm Sewer  
Systems VPDES Permit #VAR040035**

**1 May 2025**

733d Civil Engineer Squadron  
Environmental Element CEIE  
1407 Washington Blvd  
Fort Eustis, VA



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**LIST OF ABBREVIATIONS AND ACRONYMS**

BASH	Bird/Animal Aircraft Strike Hazard
BMP	Best Management Practice
cfu/yr	Colony Forming Units per Year
EPA	Environmental Protection Agency
IDDE	Illicit Discharge Detection and Elimination
JBLE–Eustis	Joint Base Langley-Eustis – Eustis
MCM	Minimum Control Measure
MFH	Military Family Housing
MS4	Municipal Separate Storm Sewer System
NMP	Nutrient Management Plan
RAB	Restoration Advisory Board
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
VAC	Virginia Administrative Code
VDEQ	Virginia Department of Environmental Quality
VESCP	Virginia Erosion and Sediment Control Plan
VPDES	Virginia Pollutant Discharge Elimination System
WLA	Wasteload Allocation

## 1.0 INTRODUCTION

### 1.1 Background

The Virginia Department of Environmental Quality (VDEQ) *1998 303(d) Total Maximum Daily Load Priority List and Report* listed Warwick River and Skiffes Creek as not supporting their designated use for shellfish harvesting due to fecal coliform bacteria standards violations. In 2008, the United States Environmental Protection Agency (EPA) approved Total Maximum Daily Loads (TMDL) for Warwick River and Skiffes Creek to address excess fecal coliform bacteria in these waterbodies (VDEQ, 2007). The TMDL report assigned individual wasteload allocations (WLA) for bacteria to the city of Newport News, York County, and Joint Base Langley-Eustis – Eustis (JBLE–Eustis). A TMDL is the maximum amount of a pollutant that a waterbody can assimilate and still support its designated use(s). A TMDL WLA is a portion of the TMDL load and represents the allowable load a permittee may discharge to the TMDL waterbody and still meet water quality standards. The WLA includes that portion of the TMDL that is assigned to permitted point sources such as Municipal Separate Storm Sewer Systems (MS4) such as JBLE-Eustis.

JBLE–Eustis is authorized to discharge stormwater from the installation in accordance with two permits issued by the Virginia Pollutant Discharge Elimination System (VPDES): The Industrial Stormwater VPDES Permit (Permit No. VA0025216, effective 01 November 2022) and the MS4 Permit (Permit No. VAR040035, effective 1 November 2023). Part II of the MS4 Permit requires JBLE–Eustis to update the MS4 program plan with a TMDL action plan that identifies measures used to address bacteria impairment in Warwick River and Skiffes Creek.

### 1.2 Purpose and Objectives

The purpose of this bacteria TMDL action plan is to demonstrate planned actions to reduce fecal bacteria sources and loadings at JBLE – Eustis. The objective of the action plan is to describe the following:

1. An assessment of significant pollutant sources
2. Best Management Practices (BMPs) to address the pollutants of concern
3. An evaluation of the results achieved by the previous action plan
4. Any adaptive management strategies to be incorporated based on previous action plan evaluation
5. Outreach strategy to enhance the public's education (including employees) on methods to eliminate and reduce discharges of the pollutants
6. A schedule of anticipated actions planned for implementation during this permit term

## 2.0 JBLE–EUSTIS INSTALLATION

JBLE–Eustis, formerly Fort Eustis, is located adjacent to the City of Newport News, Virginia, which is part of the Norfolk, Hampton, and Newport News metropolitan area. The base is located on Mulberry Island, a small peninsula bordered by the James River to the west, Warwick River to the east, and Skiffes Creek toward the north. The base occupies approximately 8,000 acres and houses a variety of military organizations and support activities. Most of the development is located at the northern end of the base, while the southern portion of the peninsula remains largely undeveloped. A site location map is presented as

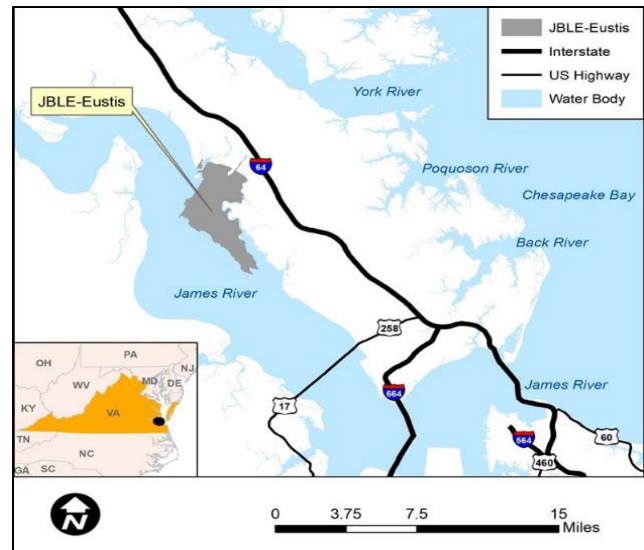
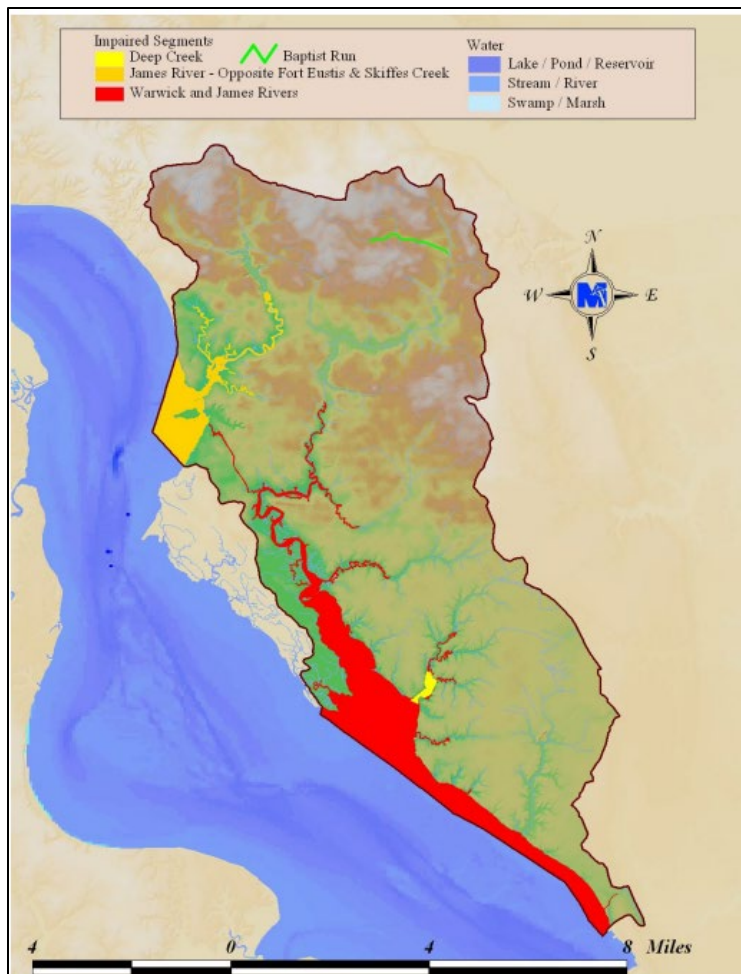


Figure 2-1. Site Location Map, JBLE–Eustis



### TMDL Waterbodies

The Warwick River and Skiffes Creek are located in the Lower James River Basin. These two waterbodies are listed as impaired for fecal coliform bacteria, in violation of the Virginia Administrative Code (VAC) 9VAC25-260-160 and 9VAC25-260-170A water quality standard. A Map showing the Warwick River TMDL watersheds and impaired stream segments within the watersheds are provided in **Error! Reference source not found.** Currently both of the JBLE-Eustis watersheds are likewise considered impaired for the Virginia Health Department (VDH) fecal coliform shellfishing use standards. Due to the tidal mixing in this location, flood (incoming) tides from the James River must meet both the VADEQ and VDH standards before the Warwick River can meet these standards.

Figure 2-2. Impaired Streams Segments  
(Source: VDEQ 2007, Figure 1.3)

### 3.0 POLLUTANT LOADING

#### 3.1 WASTE LOAD ALLOCATION (WLA)

The 2008 TMDL report for Warwick River and Skiffes Creek assigns an individual WLA to JBLE–Eustis, as presented in Table 3-1.

Table 3-1. JBLE–Eustis Fecal Bacteria WLAs and Assigned Percent Reductions

Waterbody	Wasteload Allocation (cfu/yr)*	Percent Reduction Assigned to Permitted Sources (%)
Warwick River	2.52E+10	0%
Skiffes Creek	1.05E+10	0%

\*Acronym: cfu/yr – Colony forming units per year

#### 3.2 SIGNIFICANT SOURCES OF BACTERIA on JBLE-EUSTIS

The 2008 VDEQ TMDL report identifies both natural and anthropogenic sources of bacteria in the Warwick River and Skiffes Creek watersheds, as presented in Table 3-2.

Table 3-2. Fecal Bacteria Source Allocations (%) in the TMDL Watersheds

(Source: VDEQ 2007, Table 2.8)

Watershed	Wildlife	Human	Livestock	Pet
Warwick River	18	35	23	24
Skiffes Creek	3	21	36	40

The values presented in Table 3-2 are watershed averages across multiple MS4s. To build on this information, JBLE–Eustis conducts an annual evaluation of local fecal bacteria sources with the goal of identifying potential pollutant “hot spots” or sources across the base that may need new or updated best management practices (BMPs)

This is an integral part of the regular annual assessment of the installation’s stormwater program as required by the MS4 permit. The MS4 permit requires the base to develop, implement and enforce an MS4 Program designed to reduce the discharge of pollutants from the MS4 to the maximum extent practicable in order to protect water quality. Each Minimum Control Measure (MCM) is annually evaluated to determine if any changes to the program should be made to improve the stormwater program effectiveness. The evaluation conducted in 2025 included field assessments of potential point and nonpoint sources of bacteria.

For JBLE--Eustis, the potential sources of bacteria include 1. domestic animals (horse stables and pet waste at the dog park and the resident housing area), 2. wildlife, and 3. human communities.

Part II.B.5 of the MS4 permit requires JBLE–Eustis to select and implement at least one strategy for the sources identified, designed to reduce the load of bacteria to the MS4 relevant to sources of bacteria applicable within the MS4 regulated service area. A summary of the strategies employed by the installation to address potential sources of bacteria is described below.

## 4.0 BACTERIA CONTROL MEASURES

### 4.1 Domestic Animals

#### *BMPs/Strategies*

Military Family Housing (MFH) allows domestic pets and residents are permitted to walk them throughout the base. Pet waste disposal receptacles are available along walking paths to provide convenient disposal of dog waste ( Figure 4-1). Pet waste bag dispensers (Figure 4-2) are made available to residents throughout the year and distributed at the JBLE-Eustis veterinary clinic, the community building, and environmental awareness events, where residents are briefed on the impact of pet waste on stormwater and water quality. Pet waste dispensers and rolls of bags are always available to civilian employees and contractors at the installation’s 733d Civil Engineering Squadron building.



Figure 4-1. Pet Waste Disposal Station on JBLE–Eustis

A community dog park was opened at JBLE – Eustis in May 2015. Access to the dog park is restricted, and residents must apply, register pets, pay a registration fee, and sign a receipt acknowledging the rules of the dog park. The area is fenced and equipped with a cypher lock. The rules include a requirement for owners to clean-up after their dogs. Signs are posted inside the dog park, and dog waste bags and trash receptacles are provided near the fence for pet waste disposal.

The installation also operates horse stables and pastures for authorized personnel to utilize. Horses are allowed to use the pasture during periods of good weather, where manure is not collected. However, stable bedding and horse manure are collected by patrons and stored in a roll-off bin located on site, and then disposed of by a contractor offsite.

#### *Assessment of BMP Effectiveness*

The folks who live and work on the installation are regularly educated on the importance of responsible pet-ownership and are likewise encouraged to be responsible for their domesticated animals in a convenient and easy-to-implement way utilizing these strategies. They will continue to be practiced and expanded upon as necessary and/or possible.



Figure 4-2. Free Pet Waste Bags available at several offices around JBLE–Eustis

## 4.2 Wildlife

The base employs a variety of strategies to control wildlife populations. The southern portion of the base is largely undeveloped and therefore is prime wildlife habitat.

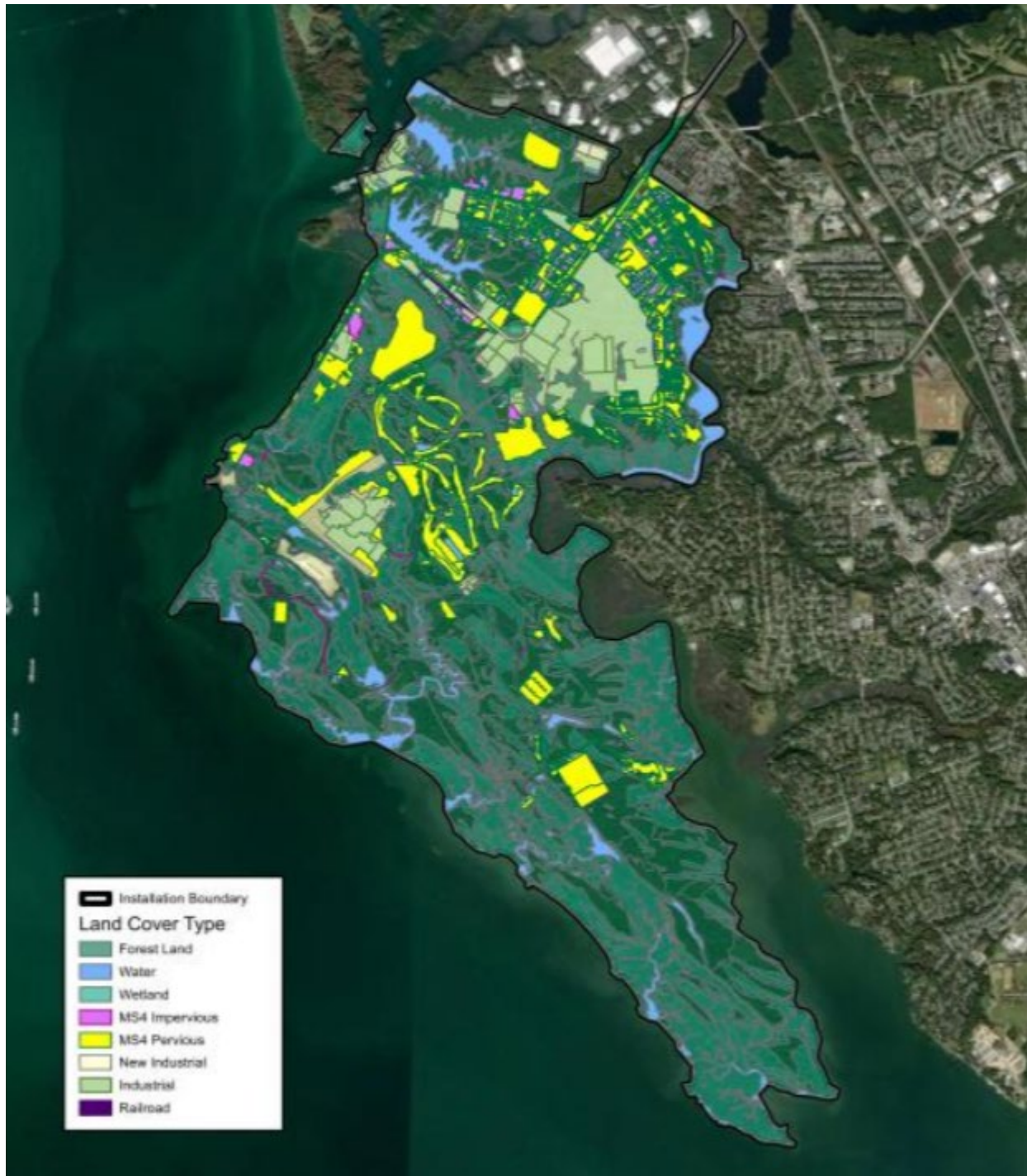


Figure 4-3. JBLE–Eustis MS4 Land Use Area

*BMPs/Strategies*

The TMDL report noted that prime raccoon habitat covers a large portion of the base that lies within the Warwick River watershed. The JBLE-Eustis Natural Resources team contracts with other federal agencies such as the USDA to remove nuisance animals such as raccoons, beavers, and nutria to manage natural populations and to reduce rabies and other contagions. Permits with federal and state government allow Bird/Animal Aircraft Strike Hazard (BASH) program personnel to trap and relocate wildlife away from the airfield. The base also removes wetlands surrounding airfields that would attract wildlife and BASH safety concerns. The BASH plan is designed to minimize aircraft exposure to potentially hazardous wildlife strikes during airfield and flying operations at Joint Base Langley-Eustis.

In the developed areas in the northern part of the base, the implementation of “No Mow” buffer zones around natural and constructed ponds deter geese from landing, foraging, and contributing to the bacteria problem.

Seasonal hunting is permitted as a management tool on JBLE-Eustis. Hunters and Fisherfolk must always register on the isportsman app and the process is monitored by the installation wildlife biologist. Seasonal deer hunting, and the occasional turkey season is available for those active duty and civilians who are interested.

Installation natural resource biologists utilize the prescribed burn plan to burn areas that will strengthen natural species and habitat creation in a healthy and manageable way, increasing biodiversity, soldier safety and education and training opportunities. Prescription fires in marshlands promote biodiversification of the environment as well as assist native vegetation regrowth.



Figure 4-4. Prescribed Burn, JBLE-Eustis, April 2024

### *Assessment of BMP Effectiveness*

The Natural Resources team will continue to implement its management goals through the BASH program and through the hunting program. Habitat management is the main way to keep wildlife off the airfield by making it undesirable in terms of food, water and shelter. The installation maintains habitat through its robust land management program. The Environmental team has been creating opportunities for land-use change, taking patches of turf grass and transforming them into mixed open with pollinator species and Virginia natives and ultimately also into reforested habitat with the Virginia Department of Forestry. Maintaining healthy practices and safeguarding against nuisance species will continue to benefit all aspects of the installation to include local water quality.

## **4.3 Residential Communities**

In residential housing communities, non-stormwater discharges can include untreated sewage that contains fecal bacteria. The JBLE–Eustis pollution prevention team has programs in place to minimize any sewage overflows.

### *BMPs/Strategies*

Dry weather field screening –The Illicit Discharge Detection and Elimination (IDDE) program is designed to help detect, identify and address non-stormwater discharges to the stormwater network. To detect illicit discharges, installation personnel regularly assesses outfalls during dry weather to determine if any non-runoff related discharges are occurring (**Error! Reference source not found.**). Dry weather screening is conducted on both industrial and non-industrial outfalls annually. Details on the IDDE program and procedures used to identify illicit discharges are provided in the JBLE–Eustis IDDE Procedures in the JBLE–Eustis MS4 Program Plan (JBLE–Eustis, 2024).



Figure 4-5. An outfall during a dry weather screening assessment

Illicit discharge elimination – Illicit discharges are generally the result of either structural issues or operational deficiencies. The mechanism for eliminating a discharge depends on the discharge type. Initiating and verifying the elimination of an illicit discharge is the responsibility of 733d CES/CEIE. 733d CES/CEIE staff provides educational materials and advocate for funding when needed to eliminate illicit discharges. Depending on the location and type of discharges, specific elimination actions may be conducted by other organizations including UECs, Housing Management staff, the installation maintenance contractor (Global Management Services [GMS]), the installation wastewater privatization contractor (Old Dominion Utility Services [ODUS]), or other outside contractors hired by JBLE–Eustis. Regardless of the entities involved in eliminating an illicit discharge, 733d CES/CEIE is responsible for following-up on the corrective actions to verify the illicit discharge has been resolved. JBLE–Eustis uses this process to implement required illicit discharge elimination procedures.

Community reporting –The installation currently utilizes the JBLE–Eustis Fire and Emergency Services telephone number as the primary hotline for reporting illicit discharges. This hotline is manned 24 hours per day, seven days per week. This number is advertised as part of the community outreach effort to educate the installation regarding illicit discharges. The spill phone is utilized by everyone on the installation and an information card with the number is given to newcomers within their first week.

Fats, Oils, and Grease (FOG) Disposal – Improper Fats, Oils, and Grease (FOG) disposal can lead to sanitary sewer overflows (SSOs) by causing blockages from FOG build-up in pipes. This can lead to an illicit discharge of wastewater into the storm sewer system. Prevention strategies include trainings for kitchen staff through annual trainings such as HRFOG as well as distribution of materials and social media to MFH residents on proper FOG disposal. Signage is posted in kitchens regarding FOG BMPs and grease management. Dining facility staff are trained in FOG management using the training provided by Hampton Roads Planning District Commission (HRPDC) at [www.hrfog.com](http://www.hrfog.com). Information and premium items are made available to housing residents at various events throughout the year.

#### *Assessment of BMP Effectiveness*

Fortunately, illicit connections on the installation have proven to be non-problematic. However, installation personnel will continue to follow the procedures and do field reconnaissance as required by the permit to perpetuate the goals of pollution prevention and good housekeeping.

Environmental staff have assessed the numbers and types of accidental spills that have occurred over the last few years, and recognize that there have been sanitary sewer overflows in the housing area. The Fats, Oils, and Grease (FOG) program is one of the high priority outreach issues in the installation's outreach program, and will continue to be a primary educational focus for folks who work and live on the installation. While the Eustis dining facilities have greatly improved their FOG operations over time, the residents in base housing continue to require regular outreach, as the sanitary sewer overflows occur in the family housing areas. The water quality team at JBLE-Eustis has been working with the Military Family Housing (MFH) office and the Hampton Roads Sanitation District (HRSD) to develop new material for the residents as they initially move into housing and will provide new written material and promotional items encouraging the proper disposal of FOG in the future.

## 5.0 PUBLIC EDUCATION STRATEGY

The base regularly distributes educational materials and coordinates events to help educate and involve the public in preventing bacteria pollution within the watershed. JBLE–Eustis utilizes websites, email messages, newspaper articles, handouts and educational materials related to high-priority water quality conditions identified in the program plan including fecal bacteria and distributes them at locations where members of the target audience are anticipated to be (e.g., World Water Day events, Earth Week/Day events, car wash events and MFH). A summary of public education and public participation efforts conducted by the base is provided below, and in the JBLE–Eustis MS4 Program Plan (JBLE–Eustis, 2024).

Utilization of websites and social media (media materials) – The installation utilizes both internal and external websites as well as social media (i.e., Facebook) to provide training and awareness to installation personnel and residents. JBLE–Eustis maintains these websites and updates them with current information to educate the public about stormwater run-off and pollution prevention practices. In addition, 733d CES/CEIE staff regularly develop outreach messages related to the three high-priority water quality issues (illegal discharges, FOG, and picking up pet waste) and posts these messages on the installation environmental Facebook page.

Informational emails (media materials) – 733d CES personnel also utilize mass emails, including installation-wide, select organizations on installation, and specific job groups (e.g., Unit Environmental Coordinator [UEC]) to communicate messages to large, targeted groups of installation personnel. JBLE–Eustis has an office that coordinates and releases operation orders (OPORDs) from the 733 Mission Support Group Operations Sections (733 MSG/OPS). Mass email messages communicate guidance on stormwater related topics that apply specifically to the target audience. In addition, the Military Family Housing (MFH) privatization contractor also sends stormwater related informational emails provided by 733d CES/CEIE to residents through their own email listservs.

Handouts/educational materials – 733d CES/CEIE develops handouts and educational materials related to the high-priority water quality conditions identified in this program plan and distributes them at locations where members of the target audience are anticipated to be (e.g., Earth Week/Day events, World Water Day, Force Support Squadron (FSS) sponsored events), and to residents of base housing upon moving in and at resident meetings. Handouts include pamphlets, children’s activity books, or one-page informational sheets that present information and provide a means to contact the Stormwater Program Manager with any questions or comments. Additional education materials include flyers and posters that can be utilized during events such as Earth Week/Day or MFH resident meetings.

Public events – 733d CES/CEIE participates in public events throughout the year, including Earth Week/Day, and monthly newcomer orientation briefings. The CEIE staff provides promo items related to the high-priority water quality items (i.e. pet waste bags) at locations where events are being held and engage with the public. When possible, Staff also presents stormwater pollution prevention information to groups of school children at General Sanford Elementary or engages in other public speaking events.

Each year, the base holds a series of events, such as World Water Day, Clean the Bay Week, America Recycles Day, Earth Day/Week and an annual Base Clean-Up Day, to help mobilize volunteers to participate in clean-up efforts across the base. For the 2023 Earth Day/Week the base distributed stormwater related material and conducted environmental related events, including a shoreline litter clean-up, turtle survey, and wildlife tours. In previous years, Earth Week events included activities such as storm drain marking, tree and shrub planting, Filterra BMP tree box maintenance, and community interactive fairs, which can help reduce the levels of pollutants such as fecal bacteria before they enter the storm drains and flow to the receiving stream. Strategies for public involvement and participation are summarized in the JBLE–Eustis MS4 Program Plan (JBLE–Eustis, 2024).

The installation participates in the Air Force’s Community Partnership Initiative, or Public-Public, Public-Private (P4) Partnership Initiative. The P4 Partnership Initiative seeks to identify and develop opportunities to share resources, increase efficiency, and improve effectiveness of operational, educational, and recreational programs. The JBLE–Eustis P4 Partnership is currently focused on the Virginia peninsula and includes a partnership with the City of Newport News to pick up and dispose of yard waste from JBLE–Eustis. In 2023, JBLE–Eustis also launched a broad outreach effort through the use of Restoration Advisory Boards (RABs) to support environmental cleanup operations. RABs are community groups that meet to discuss and receive information on environmental restoration projects at military installations. RABs provide an opportunity for communication between the community and Air Force officials and they offer a structured, focused, and interactive opportunity for community stakeholders to meaningfully participate in the clean-up process. Additional strategies used by the base for public involvement and participation are summarized in the JBLE–Eustis MS4 Program Plan (JBLE–Eustis, 2019).

Joint Base Langley-Eustis is the latest Air Force-led installation to engage in the Conservation Law Enforcement Partnership (CLEP) with the U.S. Fish and Wildlife Service. The CLEP officers work within the CES/CEIE office and support security improvement and public safety while also promoting resource conservation. These federal wildlife officers provide natural resources and water quality outreach to the installation and the community, by engaging with elementary school students in classrooms and the community, training installation personnel on wildlife laws and regulations, and participating in various community events.

## 6.0 SCHEDULE OF ANTICIPATED ACTIONS PLANNED FOR IMPLEMENTATION

The installation will implement the fecal bacteria load reducing components described in this Action Plan. As bacteria load-reducing measures are implemented and evaluated, opportunities for improving or enhancing their effectiveness will be evaluated on an annual basis. An assessment of the bacteria control measures will be conducted annually through the MS4 Annual Report, which documents progress toward implementing the MCMs and the TMDL special conditions identified in the MS4 permit.

Table 6-1. Implementation Schedule for Addressing Bacteria Impairments

Permit Year	Actions
Annually PY1-PY5	<ul style="list-style-type: none"> <li>Identify and plan opportunities for enhancing education and outreach programs to address bacteria impairment.</li> </ul>
	<ul style="list-style-type: none"> <li>Participate in outreach activities at public events</li> </ul>
	<ul style="list-style-type: none"> <li>Enhance outreach activities utilizing media, printed materials, and promotional items</li> </ul>
	<ul style="list-style-type: none"> <li>Provide spill phone awareness and training at all newcomer events</li> </ul>
	<ul style="list-style-type: none"> <li>Field reconnaissance to inspect stormwater outfalls, stormwater structural BMPs (i.e wetlands/retention ponds, extended detention ponds, bioretention basins, etc.)` and drainage areas</li> </ul>
	<ul style="list-style-type: none"> <li>Wildlife/nuisance animal management through trapping, hunting program, BASH, Fire Management</li> </ul>
	<ul style="list-style-type: none"> <li>Regularly assess the outreach program and bacteria-reduction BMPs to determine if adaptive management strategies should be developed</li> </ul>
	<ul style="list-style-type: none"> <li>Determine if additional source controls are needed. Prepare a summary of potential controls and identified programs and activities to support their implementation.</li> </ul>
PY1 - 2024	<ul style="list-style-type: none"> <li>Support the American States Utility Services, Inc. (ASUS) sanitary sewer line extension project, extending to the southern end of Mulberry Island, therefore eliminating all remaining septic systems/fields on the installation</li> </ul>
	<ul style="list-style-type: none"> <li>Collaborate with HRSD for pot scrapers and educational materials for military family housing resident outreach and education</li> </ul>
	<ul style="list-style-type: none"> <li>American States Utility Services, Inc. (ASUS) sanitary sewer line rehabilitation work complete</li> </ul>
PY2 - 2025	<ul style="list-style-type: none"> <li>Review the final Warwick River and Skiffes Creek Bacteria TMDL report approved by the EPA to identify actions to address sources of bacteria.</li> </ul>
	<ul style="list-style-type: none"> <li>Develop the Bacteria TMDL Action Plan and implementation schedule (JBLE–Eustis, 2025).</li> </ul>
	<ul style="list-style-type: none"> <li>Identify and maintain a list of existing source controls and management practices that are applicable to reducing fecal coliform bacteria.</li> </ul>
	<ul style="list-style-type: none"> <li>Demonstration Flow Monitoring after sewer rehabilitation activities have been completed as outlined in Sections 1.3 and 8.1.2 of the Federal Facility Technical Standards.</li> </ul>
PY3 - 2026	<ul style="list-style-type: none"> <li>Create new material/promotional items for residents during move-in</li> </ul>
PY4 – 2027	<ul style="list-style-type: none"> <li>Implement the FY26 funded bat management plan created for JBLEEustis by the USFWS which clarifies habitat use by listed bat species and identifies management actions which are required for sustaining or increasing listed bat populations</li> </ul>
	<ul style="list-style-type: none"> <li>BMP retrofit for Browns Lake and Eustis Lake, creating additional wetland buffers around retention ponds</li> </ul>
PY5 - 2028	<ul style="list-style-type: none"> <li>Resurvey and revalidate extent of wetlands on JBLE-Eustis through USACE. Program geodata update.</li> </ul>

## 7.0 REFERENCES

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