



**NASA Langley Research Center  
Municipal Separate Storm Sewer System (MS4) Program Plan  
Permit #VAR040092**

**December 2009 Update**

***Submitted to the Virginia Department of Conservation and Recreation in compliance with  
Permit No. VAR040092***

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## 1 Introduction

This document represents NASA Langley Research Center’s (NASA LaRC) plan to meet the requirements of 9VAC50-60 “General Virginia Stormwater Management Program (VSMP) Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems.” This plan demonstrates how NASA LaRC will meet the new permit requirements through 2013.

The permit requires NASA LaRC to control the discharge of pollutants to the maximum extent practicable by addressing six minimum control measures (MCMs).

Six Minimum Control Measures	
1. Public Education and Outreach on Stormwater Impacts	4. Construction Site Stormwater Runoff Control
2. Public Involvement/Participation	5. Post-Construction Stormwater Management
3. Illegal Discharge Detection and Elimination	6. Pollution Prevention/Good Housekeeping for Municipal Operations

NASA LaRC has reviewed and assessed existing stormwater management operations and policies at the Center against the MS4 permit compliance requirements. Based on that review, NASA LaRC has developed appropriate and cost effective best management practices (BMPs) with the goal of minimizing stormwater pollution to the maximum extent practicable.

## 2 NASA LaRC Overview

NASA LaRC is located in Hampton, Virginia and occupies 807 acres of government-owned land adjacent to several surface water bodies within the tidal zone of the Chesapeake Bay. The Center is divided into two areas identified as the West Area and the East Area. The majority of LaRC facilities are located on the West Area, 788 acres of land to the west of Langley Air Force Base (LAFB). The West Area is bound by the Brick Kiln Creek to the north, State Route 172 to the west and LAFB to the south and east. The East Area is an additional 20-acre area occupied by LaRC, situated on LAFB property and separated from the West Area by the runway facilities of LAFB. Figure 1-1 is an overview map of the LaRC West and East Areas.

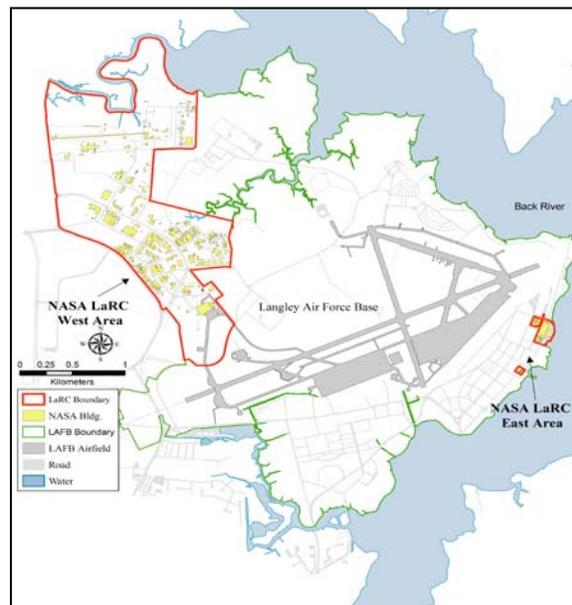


Figure 1 – NASA LaRC West and East Areas



The mission of the Center is to increase the knowledge and capability of the United States in the field of aeronautical research and in selected areas of space research. LaRC uses wind tunnels, computer modeling, and other techniques to study instrumentation, material fatigue, dynamic impacts, acoustics, and guidance controls related to aircraft and spacecraft travel. To fulfill its mission, LaRC employs approximately 3,770 individuals, including administrators, researchers, technicians, maintenance staff, and service contractors.

### **3 NASA LaRC Environmental Program and Permits**

NASA LaRC has a very proactive environmental program that includes the following program areas: Water, Air, Waste Management, Recycling, Affirmative Procurement, and Pollution Prevention (P2). The Center's goal in each of these areas is to minimize adverse effects on the quality of the environment and to ensure that the Center complies with all applicable environmental regulations and permit requirements.

Additionally, in accordance with Executive Order (E.O.) 13423, "*Strengthening Federal Environmental, Energy and Transportation Management*" and E.O. 13514, "*Federal Leadership in Environmental, Energy, and Economic Performance*" NASA LaRC has a well-developed Environmental Management System (EMS). The EMS is used as the primary management tool to ensure environmental, transportation, and energy-related activities at the Center are conducted in an environmentally and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.

NASA LaRC operates under the following four regulatory permits:

- Hampton Roads Sanitation District Permit No. 0085, which regulates sanitary sewer discharges from LaRC;
- VPDES Permit No. VA0024741 for industrial and stormwater discharges from LaRC;
- VSMP MS4 Permit No. VAR040092 for stormwater discharges from LaRC; and
- DEQ Air Operating Permit (AFS Id. No. 51-650-00006) that regulates air pollutant emissions from LaRC.

In addition, NASA LaRC is a large quantity generator of hazardous waste and operates a less than 90-day hazardous waste storage facility under EPA I.D. # VA2800005033. The Center is not permitted to treat or dispose of hazardous or regulated wastes on site. All hazardous and regulated wastes are shipped off site for treatment and disposal in accordance with applicable Federal, State, local and NASA regulations.



## **4 Roles and Responsibilities**

This section describes the roles and responsibilities of different organizations and personnel at NASA LaRC as they relate to the VSMP MS4 permit, this plan, and LaRC's overall environmental program.

### **LaRC Center Director**

- Maintain overall responsibility for LaRC's Environmental Compliance, Restoration, and Pollution Prevention Program;
- Provide authority and resources to implement this plan;
- Designate a duly authorized representative to oversee implementation of this plan.
- MS4 Permit Responsible Authority

### **LaRC Organization Unit Managers**

- Appoint a Facility Environmental Coordinator (FEC) for each facility;
- Coordinate proposed programs or projects with the Environmental Management Branch (EMB) to ensure environmental requirements are addressed prior to implementation;
- Operate facilities in accordance with applicable environmental regulations and the requirements of Langley Procedural Requirement (LPR) 8800.1, Environmental Program Manual.

### **Facility Environmental Coordinators**

- Act as the principal point of contact for all environmental matters concerning assigned facilities;
- Report known or suspected environmental problems to the EMB;
- Review operating procedures and proposed projects (facility maintenance, repairs, modifications, etc.) within assigned facilities and coordinate with the EMB to ensure environmental requirements are addressed;
- Advise facility personnel to cease any work that causes environmental problems (including compliance or permit violations) and immediately notify the EMB;
- Participate in annual FEC training provided by the EMB.

### **LaRC Environmental Management Branch**

The LaRC EMB manages the Center's Water Program and is the main point of contact for any issues involving water discharges from the Center. The EMB maintains all of the Center's environmental permits and is responsible for ensuring that LaRC complies with the effluent limitations, monitoring requirements, and other conditions set forth in the permits. Specific responsibilities for the EMB include, but are not limited to:

- Prepare the Annual Report as required by the permit;
- Approve and/or disapprove wastewater discharges from Center operations;
- Prepare applications for permit renewals;
- Notify the appropriate regulatory agencies in the event of an unauthorized discharge or permit exceedence;



- Ensure that nonhazardous, hazardous and regulated waste materials are properly managed throughout the center;
- Correspond with the regulatory agencies regarding process changes, permit modifications and regulatory guidance;
- Maintain all records and reports in accordance with the permit requirements;
- Provide training to LaRC personnel including on-site contractors regarding the Center's environmental program and permits;
- Maintain the EMB web page with guidance on water discharge procedures;
- Perform multi-media environmental audits of LaRC facilities;
- Manage LaRC's EMS program, facilitate EMS Core Team meetings, and maintain EMS documentation;
- Maintain, update, and implement the Center's Integrated Spill Contingency Plan and the LaRC Environmental Management and Sustainability Plan.

### **Research, Operations, Maintenance and Engineering (ROME) Contractor**

The Center has an on-site facility and systems maintenance support contractor who is responsible for maintaining much of the equipment, machinery and systems throughout the Center. Additional responsibilities include:

- Review and coordinate proposed maintenance and repair projects with the EMB utilizing the environmental checklist on Langley Form 69, LaRC Work Request;
- Manage wastewater discharges in accordance with permit and LaRC policy;
- Receive approval from the EMB prior to discharging any wastewater;
- Document any discharges that are approved by the EMB;
- Provide spill response equipment and support in the event of a spill;
- Designate a representative to serve as a member of LaRC's EMS Core Team;
- Participate in annual environmental training provided by the EMB.

### **LaRC Safety and Facility Assurance Branch**

- Coordinate with the EMB regarding operations and projects that have overlapping environmental and safety requirements or considerations;
- Function as Emergency Preparedness Officer (EPO) as described in LaRC's Integrated Spill Contingency Plan.
- Coordinate with the EMB for review and approval of all aspects of emergency response affecting environmental programs;
- Designate a representative to serve as a member of LaRC's EMS Core Team.

### **LaRC Facilities Engineering and Maintenance Branch**

- Coordinate proposed projects with the EMB to ensure environmental requirements are addressed prior to project implementation;
- Designate a representative to serve as a member of LaRC's EMS Core Team.



## 5 Minimum Control Measures

This section describes the Best Management Practices (BMPs) that NASA LaRC is implementing for each of the six stormwater minimum control measures and their associated goals with the General Permit (4VAC50-60-1240). NASA LaRC will periodically evaluate the BMPs to determine if the goals are being met and, if not, adjustments to this MS4 Program Plan will be proposed in the Annual Report to DCR.

### #1: Public Education and Outreach on Stormwater Impacts

*Permit Requirement: The operator shall identify, schedule, implement, evaluate and modify, as necessary, best management practices (BMPs) to meet the following public education and outreach measurable goals:*

- a. Increased individual and household knowledge about the steps that they can take to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and other local water pollution concerns.*
- b. Increased public employee, business, and general public knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications.*
- c. Increased individual and group involvement in local water quality improvement initiatives including the promotion of local restoration and clean up projects, programs, groups, meetings and other opportunities for public involvement.*
- d. Diverse strategies to target audiences specific to the area serviced by the regulated small MS4.*
- e. Improved outreach program to address viewpoints and concerns of target audiences, with a recommended focus on minorities, disadvantaged audiences and minors.*
- f. Targeted strategies towards local groups of commercial, industrial, and institutional entities likely to have significant stormwater impacts.*

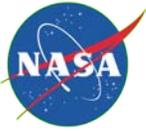
#### **BMP 1.A – Quarterly Stormwater Educational Articles**

**Objective and Expected Results:** NASA LaRC utilizes the internet and email to inform employees of policies, procedures, events, and items of interest. LaRC will prepare articles concerning the Center's operations, potential impacts to storm water, and steps that personnel can take to minimize pollutants in storm water runoff. The articles will be posted to LaRC's homepage, and Center employees will be notified via email when new articles are available on the website. The articles will also be maintained on LaRC's Environmental Management Branch (EMB) Water Management Program website. The goal is to disseminate the information about stormwater impacts to as many LaRC employees and contractors as possible.

**Implementation and Schedule:** During PY1 through PY5, four articles (quarterly) will be posted each year.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

**Measurable Goal:** Four articles (quarterly) will be posted each year. Copies of the articles will be maintained on the Center's Water Management Program website and in MS4 program files. The number of hits on the website will be documented and reported to determine the number of employees educated.



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**BMP 1.B – Stormwater Training to Center Employees and Contractors**

**Objective and Expected Results:** NASA LaRC will provide stormwater awareness training to Center personnel who handle or oversee the handling of chemical and waste materials, and to employees who engage in work that could potentially affect water quality during the General Environmental Awareness Trainings sessions. The General Environmental Awareness training course has a dedicated section on stormwater impacts and the MS4 permit. The Center's Water Management Program and Pollution Prevention Program will be included in this training and presented at multiple sessions annually. The goal of the training is to educate employees on stormwater management and the impacts of stormwater pollution on local waterways.

**Implementation and Schedule:** NASA LaRC will provide environmental awareness training annually to appropriate Center employees. Each year, several training sessions (depending on demand) will be available to employees during the month of April. Additionally, throughout the year, training will be provided to specific facilities or employees on a case by case basis.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

**Measurable Goals:** LaRC will document and report the number of training sessions and the number of attendees. The training material will be updated annually to address feedback received from previous year training to ensure effectiveness. Training class attendance will be tracked and reported through sign-in sheets as well as through a web-based attendance database to ensure appropriate employees receive training and refresher training each year.

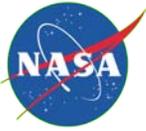
**BMP 1.C – Maintain and Update the LaRC EMB website**

**Objective and Expected Result:** NASA LaRC will maintain and update a comprehensive web site that includes current information about environmental regulations and the Center's environmental programs. The goal of having the web site is to provide Center personnel with up-to-date information regarding pollution prevention and waste management procedures and to provide employees with links to other educational environmental web sites. NASA LaRC will create, maintain and update a comprehensive section on the EMB web site in order to provide employees with links to other educational TMDL web sites. Links will include, but not limited to, DCR, EPA, and DEQ TMDL websites.

**Implementation and Schedule:** This BMP will be performed throughout the term of the permit.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

**Measurable Goal:** For PY1 through PY5, the website will be reviewed every six months and updates made as needed. The website will be maintained and updated in accordance with NASA's IT policies and the effectiveness will be tracked through the



use of a visitor counting mechanism as well as receiving feedback from LaRC employees.

## #2: Public Involvement and Participation

*Permit Requirement: At a minimum, comply with applicable state, tribal, and local public notice requirements when implementing the MS4 Program. The operator shall identify, schedule, implement, evaluate and modify, as necessary, best management practices (BMPs) to meet the following public involvement/participation measurable goals:*

*a. Promote the availability of the operator's MS4 Program Plan and any modifications for public review and comment. Public notice shall be given by any method reasonably calculated to give actual notice of the action in question to the persons potentially affected by it, including press releases or any other forum or medium to elicit public participation. Provide access to or copies of the MS4 Program Plan or any modifications upon request of interested parties in compliance with all applicable freedom of information regulations.*

*b. Provide access to or copies of the annual report upon request of interested parties in compliance with all applicable freedom of information regulations.*

*c. Participate, through promotion, sponsorship, or other involvement, in local activities aimed at increasing public participation to reduce stormwater pollutant loads and improve water quality.*

### **BMP 2.A –MS4 Program Plan Review**

**Objective and Expected Results:** NASA LaRC has made the MS4 Program Plan available to Center employees for review and comment through the LaRC EMB Water Management Program website. Employees will be notified of availability through training classes as well as email notifications. The goal is to ensure employee participation in reducing stormwater pollutant discharges from the Center.

**Implementation and Schedule:** This BMP will be performed throughout the term of the permit.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

**Measurable Goal:** Comments or suggestions received from Center employees regarding the MS4 Program Plan and any updates will be documented and maintained by the LaRC Water Program Manager. NASA LaRC will continue to assess whether there are additional ways to increase employee involvement and participation in the reduction of stormwater pollutant discharges from the Center. LaRC will document and report the number of comments received each year.

### **BMP 2.B – Perform Environmental Audits of LaRC Facilities**

**Objective and Expected Results:** NASA LaRC will perform multi-media environmental audits of different facilities located at the Center. A Facility Environmental Coordinator (FEC) is assigned to each facility at LaRC and they will participate in the audits to ensure their facilities operate in compliance with all environmental regulations. The FECs will ensure that facility personnel are aware of LaRC's MS4 Program Plan as well as implementing BMPs to reduce stormwater pollution from Center activities. In addition to ensuring environmental compliance, the goal of the audits is to actively involve LaRC personnel in the Center's environmental management program. The audits will be documented through the use of a multi-media environmental checklist and any findings



will be recorded electronically to facilitate tracking. Results of the audits will be presented to the FEC in the form of a report and any findings will include recommendations as well as a required closure date. Open findings will be closely monitored using the tracking database to resolution and closure.

**Implementation and Schedule:** This BMP will be performed throughout the term of the permit.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

**Measurable Goal:** NASA LaRC will perform forty multi-media environmental audits of Center facilities annually for PY1 through PY5. The number of audits performed and closed findings will be included in the Annual Report.

### **BMP 2.C – Identify and Implement Pollution Prevention Projects**

**Objective and Expected Results:** NASA LaRC will encourage LaRC personnel to identify and implement pollution prevention projects at their facilities. NASA LaRC may fund implementation of projects using proceeds generated from the sale of recyclable materials at the Center. The goal is to encourage personnel to identify P2 projects that may reduce or eliminate stormwater pollutant discharges and to facilitate implementation.

**Implementation and Schedule:** This BMP will be performed throughout the term of the permit.

**Responsible Parties:** The LaRC Environmental Management Branch will work with facility personnel to identify and implement this BMP.

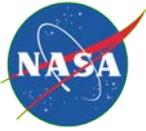
**Measurable Goal:** Implementation of any P2 projects will be included in the Annual Report. LaRC will document and report the number and frequency of pollution prevention type projects that involve the public.

### **BMP 2.D Promote Local Area Stormwater Initiatives and Events**

**Objective and Expected Results:** NASA LaRC will utilize the @LaRC Intranet page that all employees visit on a daily basis to promote local programs and events. Local programs such as HR Storm, the Chesapeake Bay Foundation, Green Bag Lunch Forums, etc. and events like Clean the Bay Days will be promoted. The goal is to disseminate this information to as many LaRC employees as possible. Also, LaRC participates in a myriad of events such as an annual Earth Day and Take Your Children to Work Say event. Stormwater-related educational information will be disseminated at these types of events.

**Implementation and Schedule:** This BMP will be performed throughout the term of the permit.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.



**Measurable Goals:** During PY2 – PY5 a minimum of two announcements will be posted on the @LaRC site. Copies of the announcements will be kept on file. The number of hits to the announcements will be documented and reported. LaRC will also document and report the number on-Center and local area events LaRC participates in and the estimated number of event attendees where stormwater-related information is disseminated.

### #3: Illicit Discharge Detection and Elimination

*Permit Requirement: The MS4 Program shall:*

- a. Develop, implement and enforce a program to detect and eliminate illicit discharges, as defined at 4VAC50-60-10, into the regulated small MS4. The Department recommends that the operator review the publication entitled “Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments”, for guidance in implementing and evaluating its illicit discharge detection and elimination program.*
- b. Develop, if not already completed, and maintain, an updated storm sewer system map, showing the location of all known outfalls of the regulated small MS4 including those physically interconnected to a regulated MS4, the associated surface waters and HUCs, and the names and locations of all impaired surface waters that receive discharges from those outfalls. The operator shall also estimate the acreage within the regulated small MS4 discharging to each HUC and impaired water.*
- c. To the extent allowable under state, tribal or local law or other regulatory mechanism, effectively prohibit, through ordinance, or other regulatory mechanism, non-stormwater discharges into the storm sewer system and implement appropriate enforcement procedures and actions.*
- d. Develop and implement procedures to detect and address non-stormwater discharges, including illegal dumping, to the regulated small MS4.*
- e. Prevent or minimize to the maximum extent practicable, the discharge of hazardous substances or oil in the stormwater discharge(s) from the regulated small MS4. In addition, the MS4 Program must be reviewed to identify measures to prevent the recurrence of such releases and to respond to such releases, and the program must be modified where appropriate. This permit does not relieve the operator or the responsible part(ies) of any reporting requirements of 40 CFR Part 110 (2001), 40 CFR Part 117 (2001) and 40 CFR Part 302 (2001) or §62.1-44.34:19 of the Code of Virginia.*
- f. Track the number of illicit discharges identified, provide narrative on how they were controlled or eliminated, and submit the information in accordance with Section II.E.2.*
- g. Notify, in writing, any downstream regulated MS4 to which the small regulated MS4 is physically interconnected of the small regulated MS4’s connection to that system.*

Maps of NASA LaRC’s storm sewer system and outfalls are included in the Center’s web-based Master Plan, which is maintained by the LaRC GIS team. The LaRC Master Plan web site is available to all LaRC employees.

#### **BMP 3.A – Ensure that Center Policies Prohibit Illicit Discharges**

**Objective and Expected Results:** NASA LaRC has written policies such as LaRC’s VPDES Operations and Maintenance (O&M) Manual and Langley Procedural Requirement (LPR) 8800.1 “Environmental Program Manual” that prohibit illicit discharges to the Center’s storm sewer system. NASA does not specifically utilize ordinances, but these documents serve that capacity. NASA LaRC will make Center personnel aware of these policies with the goal being to prevent and/or eliminate illicit discharges. Additionally, information about LaRC’s O&M Manual and ways to detect and



eliminate illicit discharges will be included in the annual environmental awareness training classes.

**Implementation and Schedule:** This BMP will be performed throughout the term of the permit.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

**Measurable Goal:** LaRC will annually review the policies and procedures to ensure effectiveness and updates or revisions will be included in the Annual Report.

### **BMP 3.B – Perform Dry Weather Outfall Inspections**

**Objective and Expected Results:** NASA LaRC will perform inspections of the Center's outfalls during dry weather conditions to monitor for non-storm water discharges. The goal is to identify and prevent any illicit discharges of pollutants.

**Implementation and Schedule:** This BMP will be performed throughout the term of the permit.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

**Measurable Goal:** Throughout PY1 through PY5, the outfall inspections will be performed at least weekly by the LaRC Water Program Manager. NASA LaRC will ensure that any unusual conditions or discharges observed during the outfall inspections are documented. The information will be used to develop corrective action and identification plans in order to prevent illicit discharges. LaRC will document and report the number of inspections conducted.

### **BMP 3.C – Center-wide Illicit Discharge Inspections and Assessments**

**Objective and Expected Results:** The goal of this program is for EMB staff to periodically inspect the Center for potential illicit discharges with a focus on eliminating them. These inspections and assessments are intended to include components of the MS4 such as ditches and swales, but also buildings, labs, sump pumps, etc. These inspections and assessment focus on more than only outfalls. For example, EMB performed 38 sump pump assessments and inspected a total of 92 sump pumps during PY1. Each sump pump was documented, photographed, evaluated, and given a risk rating (none – low – high). High risk sumps, if they had the immediate potential for an illicit discharge of oil or other hazardous chemical, were immediately remedied. All of the sumps were mapped using GIS and work plan is currently being developed to address risk concerns. The majority of risks identified were poor housekeeping in basements and oil storage near a sump pump. These are the types of assessments that will take place in this BMP.

**Implementation and Schedule:** Throughout PY1 through PY5, inspections/assessments will be performed throughout the year as EMB staff is in the field.



**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

**Measurable Goal:** LaRC will document and report the number of inspections/assessments conducted each year and the number of illicit discharges identified and eliminated.

#### #4: Construction Site Storm Water Runoff Control

*Permit Requirement:*

*a. The operator shall develop, implement, and enforce procedures to reduce pollutants in any stormwater runoff to the regulated small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre or equal to or greater than 2,500 square feet in all areas of the jurisdictions designated as subject to the Chesapeake Bay Preservation Area Designation and Management Regulations adopted pursuant to the Chesapeake Bay Preservation Act. Additionally, reduction of stormwater discharges from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. The procedures must include the development and implementation of, at a minimum:*

*(1) An ordinance or other mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance with the Erosion and Sediment Control Law and attendant regulations, to the extent allowable under state, tribal, or local law. Such ordinances and other mechanisms shall be updated as necessary.*

*(2) Requirements for construction site owners/operators to implement appropriate erosion and sediment control best management practices as part of an erosion and sediment control plan that is consistent with the Erosion and Sediment Control Law and attendant regulations and other applicable requirements of state, tribal, or local law. Where determined appropriate by the operator, the operator shall encourage the use of structural and non-structural design techniques to create a design that has the goal of maintaining or replicating predevelopment runoff characteristics and site hydrology.*

*(3) Requirements for construction site operators to secure authorization to discharge stormwater from construction activities under a VSMP permit for construction activities that result in a land disturbance of greater than or equal to one acre or equal to or greater than 2,500 square feet in all areas of the jurisdictions designated as subject to the Chesapeake Bay Preservation Area Designation and Management Regulations adopted pursuant to the Chesapeake Bay Preservation Act. Additionally, reduction of stormwater discharges from construction activity disturbing less than one acre must be included in the procedures if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more;*

*(4) Procedures for receipt and consideration of information submitted by the public; and*

*(5) Procedures for site inspection and enforcement of control measures.*

*b. The operator shall ensure that plan reviewers, inspectors, program administrators and construction site owners/operators obtain the appropriate certifications as required under the Erosion and Sediment Control Law.*

*c. The operator shall track regulated land-disturbing activities and submit the following information in accordance with Section II E 2:*

*(1) Total number of regulated land-disturbing activities; and*

*(2) Total disturbed acreage.*



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#### **BMP 4.A – LaRC’s MS4 Construction Program**

**Objective and Expected Results:** LaRC primarily uses contractors for construction, deconstruction/demolition, and renovation projects. Therefore, the most effective policy tool for LaRC is contract and specification language requiring compliance with our MS4 program, DCR’s VSMP permit (any project over 2,500 square feet), and DCR’s Erosion and Sediment control regulations. Construction contracts include specific language requiring that the contractor secure the appropriate stormwater permits and follow appropriate stormwater BMPs. The contract language was evaluated and LaRC updated and implemented new contract language during the PY 1 (of the current permit cycle) that ensures compliance with all of these requirements. The new language is more clear and effective. The goal is to reduce stormwater pollution impacts during land disturbing activities to the maximum extent practicable.

The contract language requires construction site operators to submit Stormwater Pollution Prevention Plans (SWPPP) to EMB prior to a contractor pulling a VSMP from DCR or starting work. EMB reviews, comments on, and approves all SWPPPs. SWPPPs are reviewed for compliance with the VSMP permit, feasibility of structural and non-structural controls, etc. The contract language also requires that the contractor submit an Erosion and Sediment Control Plan (which can be a section of the SWPPP) to EMB as well. EMB reviews the plan and forwards the plan to the Suffolk Regional DCR office for approval. Once all approvals are made and the VSMP permit coverage letter is received, construction may commence. Throughout construction activities, the EMB performs stormwater-related construction site inspections (see BMP 4.B).

Public comment on major construction sites is solicited through NASA’s National Environmental Policy Act (NEPA) program. All major construction activity is subject to NEPA regulation and an Environmental Assessment (EA) is required to be completed. Water quality and stormwater are sections in each EA. A Notice of Availability (NOA) is posted in a local newspaper and a copy of the EA is available at a local public library for review and comment by the public.

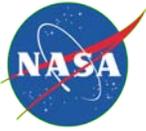
**Implementation and Schedule:** This program is currently in place. This BMP will be performed throughout the term of the permit.

**Responsible Parties:** The LaRC Environmental Management Branch will coordinate this BMP with appropriate LaRC offices.

**Measurable Goals:** LaRC will document and report the number of construction site projects (over 2,500 square feet) in each Permit Year and the number of disturbed acres. LaRC will also document and report the number of comments (public and employee) received regarding construction sites and how LaRC addresses those comments.

#### **BMP 4.B - Construction Site Stormwater Inspection Program**

**Objective and Expected Results:** NASA inspectors will conduct stormwater construction site inspections on all projects over 2,500 square feet in size. LaRC also requires qualified site operators to conduct inspections for compliance with their VSMP permit coverage. The objective is to ensure that contractors are adhering to LaRC



requirements and their approved SWPPP. NASA inspectors will also look for adequate erosion and sediment controls and that SWPPPs are being updated as required.

**Implementation and Schedule:** LaRC will conduct stormwater construction site inspections throughout the permit term whenever construction activities are occurring.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

**Measurable Goals:** Inspection reports will be kept on file. LaRC will document and report the number of stormwater construction site inspections conducted and any noteworthy findings in future annual reports.

#### **BMP 4.C - Appropriate Certifications as Required Under the Erosion and Sediment Control Law**

**Objective and Expected Results:** LaRC implements this BMP in two ways. Since construction contractors are heavily relied upon for construction activities, contract language has been developed which requires that all contractors hold at least a DCR Responsible Land Disturber Certification. Secondly, LaRC employees, notably from the EMB Office, will also attend DCR training courses and obtain certifications when necessary. Training and certification records will be kept in the MS4 files.

**Implementation and Schedule:** For PY1 through PY5, NASA LaRC employees and construction contractors will hold appropriate certifications.

**Responsible Parties:** The LaRC Environmental Management Branch will coordinate this BMP with appropriate LaRC offices and construction contractors.

**Measurable Goals:** Document and report the number of relevant training courses attended and the number of applicable certifications held by LaRC staff in future annual reports.

### **#5: Post-Construction Stormwater Management**

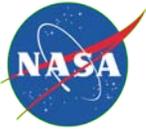
*Permit Requirements:*

*a. The operator shall develop, implement, and enforce procedures to address stormwater runoff to the regulated small MS4 from new development and redevelopment projects that disturb greater than or equal to one acre, or equal to 2,500 square feet in all areas of the jurisdictions designated as subject to the Chesapeake Bay Preservation Area Destination and Management Regulations adopted pursuant to the Chesapeake Bay Preservation Act, including projects less than one-acre that are part of a larger common plan of development or sale, that discharge into the regulated small MS4. The procedures must ensure that controls are in place that would prevent or minimize water quality and quantity impacts in accordance with this section.*

*b. The operator shall:*

*(1) Develop and implement strategies which include a combination of structural and/or nonstructural best management practices (BMPs) appropriate for the community. Where determined appropriate by the operator, the operator shall encourage the use of structural and non-structural design techniques to create a design that has the goal of maintaining or replicating predevelopment runoff characteristics and site hydrology;*

*(2) Use an ordinance, regulation, or other mechanism to address post-construction runoff from new development and redevelopment projects to ensure compliance with the Virginia Stormwater*



*Management Act and attendant regulations, and to the extent allowable under state, tribal or local law. Such ordinances and other mechanisms shall be updated as necessary;*

*(3) Require construction site owners/operators to secure authorization to discharge stormwater from construction activities under a VSMP permit for new development and redevelopment projects that result in a land disturbance of greater than or equal to one acre or equal to or greater than 2,500 square feet in all areas of the jurisdictions designated as subject to the Chesapeake Bay Preservation Area Designation and Management Regulations adopted pursuant to the Chesapeake Bay Preservation Act. Additionally, reduction of stormwater discharges from construction activity disturbing less than one acre must be included in the procedures if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more;*

*(4) Require adequate long-term operation and maintenance by the owner of structural stormwater management facilities through requiring the owner to develop a recorded inspection schedule and maintenance agreement [to the extent allowable under state, tribal or local law or other legal mechanism]. The operator shall additionally develop, through the maintenance agreement or other method, a mechanism for enforcement of maintenance responsibilities by the operator if they are neglected by the owner;*

*(5) Conduct site inspection and enforcement measures consistent with the Virginia Stormwater Management Act and attendant regulations;*

*(6) Track all known permanent stormwater management facilities that discharge to the regulated small MS4 and submit the following information in accordance with Section II E 2:*

*(a) Type of structural stormwater management facility installed as defined in the Virginia Stormwater Management Handbook;*

*(b) Geographic location (HUC);*

*(c) Where applicable, the impaired surface water that the stormwater management facility is discharging into; and*

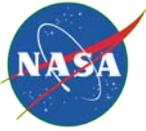
*(d) Number of acres treated.*

### **BMP 5.A – Implement Post-Construction Runoff Control Program**

**Objective and Expected Results:** In the event of a new development or redevelopment project at LaRC that disturbs greater than or equal to 2,500 square feet of land, NASA LaRC will develop, implement and enforce a program to address storm water runoff. This program will also be in compliance with the Energy Independence and Security Act of 2007 Sec.438. The goal of this BMP is to use site planning and design to maintain or restore to the maximum extent technically feasible the predevelopment hydrology of the property with regard to temperature, rate, volume and duration of flow.

LaRC primarily uses contractors for construction, deconstruction/demolition, and renovation projects. Therefore, the most effective policy tool for LaRC is contract and specification language requiring compliance with this BMP. The program will include designing non-structural and structural BMPs appropriate to the specific project with the goal being to minimize post-construction stormwater runoff. LaRC will develop appropriate contract language to ensure that post-construction stormwater runoff is properly managed. LaRC currently ensures that all projects over 2,500 square feet obtain VSMP permit coverage through the MS4 Construction Program (see BMP 4.A).

**Implementation and Schedule:** During PY2 through PY3, LaRC will develop and begin implementing the applicable contract language and specification language. During PY4 – PY5 the program will be fully implemented.



**Responsible Parties:** The LaRC Environmental Management Branch will coordinate implementation of this BMP with appropriate LaRC organizations and personnel.

**Measurable Goals:** LaRC will document and report the number of projects over 2,500 square feet and how post-construction stormwater was addressed. NASA LaRC will evaluate the effectiveness of any post-construction stormwater management activities and provide a summary of the evaluation in the Annual Report.

### **BMP 5.B – Stormwater Management Facilities Management**

**Objective and Expected Results:** Currently, LaRC does not have any permanent stormwater management facilities as defined in the Virginia Stormwater Management Handbook. However, in the future LaRC will have some stormwater management facilities such as bio-retention areas, green roofs, bio-swales, and pervious parking lots and they will need to be properly managed. As these types of facilities are constructed, LaRC will inspect and maintain these structures in accordance with the Virginia Stormwater Management Handbook.

**Implementation and Schedule:** This BMP will be performed throughout the term of the permit when it becomes applicable.

**Responsible Parties:** The LaRC Environmental Management Branch will coordinate implementation of this BMP with appropriate LaRC organizations and personnel.

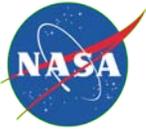
**Measurable Goals:** Track all known permanent stormwater management facilities and report the impaired surface water that the stormwater management facility is discharging into and number of acres treated in future Annual Reports.

## **#6: Pollution Prevention and Good Housekeeping**

### *Permit Requirements:*

*Develop and implement an operation and maintenance program consistent with the MS4 Program Plan that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. Using training materials including those available from EPA, state, tribe, or other organizations, the program shall include employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and MS4 maintenance. The operator is encouraged to review the Environmental Protection Agency's (EPA's) National Menu of Stormwater Best Management Practices for ideas and strategies to incorporate into its program. The operator shall identify, implement, evaluate and modify, as necessary, best management practices (BMPs) to meet the following pollution prevention/good housekeeping for municipal operations measurable goals:*

- (1) Operation and maintenance programs including activities, schedules, and inspection procedures shall include provisions and controls to reduce pollutant discharges into the regulated small MS4 and receiving surface waters.*
- (2) Illicit discharges shall be eliminated from storage yards, fleet or maintenance shops, outdoor storage areas, rest areas, waste transfer stations, and other municipal facilities.*
- (3) Waste materials shall be disposed of properly.*
- (4) Materials that are soluble or erodible shall be protected from exposure to precipitation.*
- (5) Materials, including but not limited to fertilizers and pesticides, that have the potential to pollute receiving surface waters shall be applied according to manufacturer's recommendations.*
- (6) For state agencies with lands where nutrients are applied, nutrient management plans shall be*



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*developed and implemented in accordance with the requirements of §10.1-104.4 of the Code of Virginia.*

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### **BMP 6.A – Street Sweeping**

**Objective and Expected Results:** Street sweeping is LaRC's preferred method to prevent stormwater pollution coming from our streets. Street sweeping is aimed at collecting debris and floatables prior to being washed into the MS4 and discharged into local waterways.

**Implementation and Schedule:** Pavement street sweeping is scheduled four times annually (Jan/Apr/July/Oct) through a contracted service company. This BMP will be performed throughout the term of the permit.

**Responsible Parties:** The LaRC Environmental Management Branch will coordinate implementation of this BMP with appropriate LaRC organizations and personnel. Grounds Maintenance is in charge of managing the street sweeping contract and reporting street sweeping dates to EMB.

**Measurable Goals:** LaRC will document and report the number of street sweeping activities that occur and the estimated amount (Cubic Yards) of debris collected and properly disposed of in future Annual Reports.

### **BMP 6.B – Provide Pollution Prevention Training to LaRC Personnel**

**Objective and Expected Results:** NASA LaRC will provide personnel and contractors with training that includes information on using good housekeeping procedures and employing pollution prevention techniques in performing their jobs. In addition to preventing pollutant discharges, well-informed employees are more able to recognize potential illicit discharges.

**Implementation and Schedule:** NASA LaRC will provide the training to personnel and contractors during the annual environmental awareness training class and in separate specialized training classes as needed. This BMP will be performed throughout the term of the permit.

**Responsible Parties:** The LaRC Environmental Management Branch will coordinate this BMP.

**Documentation and Measure of Effectiveness:** Training class attendance will be tracked through sign-in sheets as well as through a web-based attendance database to ensure appropriate employees receive training and refresher training each year. The training material will be updated annually to address feedback received from previous year training to ensure effectiveness.

### **BMP 6.C Illicit Discharge Detection Program at Storage Yards, the fleet Maintenance Yard, the Hazardous Waste Facility and Other Facilities**

**Objective and Expected Results:** EMB personnel will inspect all yard areas, the hazardous waste facility and other facilities for potential illicit discharges. Issues such as



evidence of illegal dumping, illicit connections to the storm sewer system, and flows during dry weather will be looked for and eliminated if found.

**Implementation and Schedule:** LaRC will conduct illicit discharge site inspections throughout the permit term at various facilities. This BMP will be performed throughout the term of the permit.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

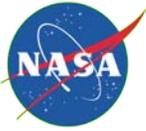
**Measurable Goals:** A minimum of four inspections will be performed each permit year. Inspections reports will be kept on file. LaRC will document and report the total number of illicit discharge detection and elimination facility inspections conducted in future Annual Reports.

### Total Maximum Daily Load (TMDL) Special Conditions Compliance

*Permit Requirements:*

*B. Special conditions. A total maximum daily load (TMDL) approved by the State Water Control Board may include a wasteload allocation to the regulated small MS4 that identifies the pollutant for which stormwater controls are necessary for the surface waters to meet water quality standards. The pollutant identified in a wasteload allocation as of the effective date of this permit must be addressed through the measurable goals of the MS4 Program Plan. A wasteload allocation does not establish that the operator of a regulated small MS4 is in or out of compliance with the conditions of this permit.*

- 1. The operator shall update its MS4 Program Plan to include measurable goals, schedules, and strategies to ensure MS4 Program consistency with the assumptions of the TMDL WLA within 18 months of permit coverage; or, within 18 months of the effective date of any reopening of this permit to include wasteloads allocated to the regulated small MS4 after issuance of permit coverage.*
- 2. The measurable goals, schedules, strategies, and other best management practices (BMPs), required in an updated MS4 Program Plan to assure MS4 Program consistency with an approved TMDL for the pollutant identified in a WLA are, at a minimum:*
  - a. The operator shall develop a list of its current ordinances and legal authorities, BMPs, policies, plans, procedures and contracts implemented as part of the MS4 Program that are applicable to reducing the pollutant identified in a WLA.*
  - b. The operator shall evaluate existing ordinances and legal authorities, BMPs, policies, plans, procedures and contracts of the existing MS4 Program to determine the effectiveness of the MS4 Program in addressing reductions of the pollutant identified in the WLA. The evaluation shall identify any weakness or limitation in the MS4 Program to reduce the pollutant identified in the WLA in a manner consistent with the TMDL.*
  - c. The operator shall develop a schedule to implement procedures and strategies that address the MS4 Program weaknesses such as timetables to update existing ordinances and legal authorities within two years, BMPs, policies, plans, procedures and contracts to ensure consistency with the assumptions of the TMDL WLA. When possible, source elimination shall be prioritized over load reduction.*
  - d. The operator shall implement the schedule established in Section I B 2 c.*
- 3. The operator shall integrate an awareness campaign into its existing public education and outreach program that promotes methods to eliminate and reduce discharges of the pollutant identified in the WLA. This may include additional employee training regarding the sources*



*and methods to eliminate and minimize the discharge of the pollutant identified in the WLA.*

*4. The operator is encouraged to participate as a stakeholder in the development of any implementation plans developed to address the TMDL and shall incorporate applicable best management practices identified in the TMDL implementation plan in their MS4 Program Plan. The operator may choose to implement BMPs of equivalent design and efficiency instead of those identified in the TMDL implementation plan, provided that the rationale for any substituted BMP is provided and the substituted BMP is consistent with the TMDL and the WLA.*

*5. The operator shall develop and implement outfall reconnaissance procedures to identify potential sources of the pollutant identified in the WLA from anthropogenic activities. The operator shall conduct reconnaissance in accordance with the following:*

*a. Should the operator have 250 or more total outfalls discharging to the surface water identified in the WLA, the operator shall perform reconnaissance on a minimum of 250 outfalls for each WLA assigned at least once during the five-year permit period and shall perform reconnaissance on a minimum of 35 outfalls per year.*

*b. Should the operator have less than 250 total outfalls discharging to an identified surface water, the operator shall perform reconnaissance on all outfalls during the five-year permit period and shall annually conduct reconnaissance on a minimum of 15% of its known MS4 outfalls discharging to the surface water for which the WLA has been assigned.*

*The department recommends that the operator review the publication entitled "Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments," EPA cooperative agreement number X-82907801-0, for guidance in implementing its outfall reconnaissance procedures. The operator shall implement procedures designed to reduce the discharge of the pollutant in a manner consistent with the TMDL. Physically interconnected MS4s may coordinate outfall reconnaissance to meet the requirements of this subdivision.*

*6. The operator shall evaluate all properties owned or operated by the MS4 operator that are not covered under a separate VPDES permit for potential sources of the pollutant identified in the WLA. Within three years of the required date for updating the MS4 Program Plan, the operator shall conduct a site review and characterize the runoff for those properties where it determines that the pollutant identified in the WLA is currently stored, or has been transferred, transported or historically disposed of in a manner that would expose it to precipitation in accordance with the following schedule:*

*a. As a part of the site review, the operator shall collect a total of two samples from a representative outfall for each identified municipal property. One sample shall be taken during each of the following six-month periods: October through March, and April through September.*

*b. All collected samples shall be grab samples and collected within the first 30 minutes of a runoff producing event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previous measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the property. The required 72-hour storm event interval may also be waived where the operator documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. Analytical methods shall be conducted according to procedures approved under 40 CFR Part 136 or alternative methods approved by the Environmental Protection Agency (EPA). Where an approved 40 CFR Part 136 method does not exist, the operator must use a method consistent with the TMDL.*

*c. For properties where there is found to be a discharge of the pollutant identified in the*



*WLA, the operator shall develop and implement a schedule to minimize the discharge of the pollutant identified in the WLA in a manner consistent with the approved TMDL.*

*7. The operator shall conduct an annual characterization that estimates the volume of stormwater discharged, in cubic feet, and the quantity of pollutant identified in the WLA, in a unit consistent with the WLA, discharged by the regulated small MS4.*

*8. As part of the annual evaluation, the operator shall update the MS4 Program Plan to include any new information regarding the TMDL in order to ensure consistency with the TMDL.*

LaRC is subject to the TMDL Special Conditions section of the MS4 General Permit due to a Bacteria TMDL for the Back River watershed. This TMDL is based off of a land use rationale and no waste load allocation (WLA) has been assigned to LaRC. The TMDL utilizes an aggregate waste load versus a WLA. Bacterial sources coming from LaRC are extremely limited and can be mostly found attributed to migrant wildlife. LaRC has no residences, no pets, no bacteria generating processes, and utilizes a sanitary sewer system (HRSD) for human waste. These unique circumstances along with the pollutant in question make some of the permit's special conditions difficult to address in the MS4 Program Plan. The following BMPs have been added to the Plan to address the TMDL special conditions:

#### **BMP Special Condition – Develop and Implement TMDL Policy Statements**

**Objective and Expected Result:** LaRC will develop a list of its current legal authorities, BMPs, policies, plans, procedures and contracts that could be applicable to reducing the bacteria pollutants. Updates to these documents will be made if needed. LaRC will also evaluate the existing policies, plans, procedures and contracts to determine the effectiveness of the MS4 Program in addressing reductions of bacteria. Program weaknesses will be addressed as identified.

**Implementation and Schedule:** EMB will review current policies and develop new policies (if necessary) during PY 2 through PY 3. During PY 4 through PY 5 the TMDL program will be implemented and enforced.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

**Measurable Goal:** A list of applicable policies will be submitted in the Year 2 and Year 3 Annual Report and along with a summary of changes to these policies to better address bacterial contamination (if needed). During PY 4 through PY 5, the MS4 Program Plan will be updated when program weaknesses are identified.

#### **BMP Special Condition – LaRC EMB website TMDL Section**

**Objective and Expected Result:** NASA LaRC will create, maintain and update a comprehensive section on the EMB web site that includes current information about TMDLs. The goal of having the web site is to provide Center personnel with up-to-date information on TMDLs (especially bacteria) and to provide employees with links to other educational TMDL web sites. Links will include, but not limited to, DCR, EPA, and DEQ TMDL websites.



**Implementation and Schedule:** The TMDL Section of the website will be created during PY2. For PY2 through PY5, the website will be reviewed every six months and updates made as needed.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

**Measurable Goal:** LaRC will develop and maintain the TMDL section of the website in accordance with NASA's IT policies and the effectiveness will be tracked through the use of a visitor counting mechanism. LaRC will document and report the number of visitors to the Website in future Annual Reports.

**BMP Special Condition – Outfall Reconnaissance**

**Objective and Expected Result:** LaRC will conduct outfall reconnaissance for bacteria weekly during the already established outfall dry weather inspection program (see BMP 3.B). Evidence of bacterial contamination will be added as part of the current inspection procedure. Indicators such as water color, odor, excessive algae blooms, etc. will be part of the inspection procedure.

**Implementation and Schedule:** This BMP will be performed throughout the term of the permit.

**Responsible Parties:** The LaRC Environmental Management Branch will implement this BMP.

**Measurable Goal:** Throughout PY1 through PY5, the inspections will be performed at least weekly by the LaRC Water Program Manager. NASA LaRC will ensure that any unusual conditions or discharges observed during the outfall inspections are documented. The information will be used to develop corrective action and identification plans in order to prevent bacteria discharges if applicable. LaRC will document and report the number of inspections conducted in future Annual Reports.



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**Signed Certification Statement in accordance with 4VAC 50-60-370**

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."

*L B Roe*

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Lesia Roe, Center Director

*11/18/09*

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Date