NASA Langley Research Center

Annual Standards and Specifications:

Erosion and Sediment Control (ESC)

&

Stormwater Management (SWM)

2014 Version

Table of Contents

i. Abbreviations and Acronyms

BMP - Best Management Practice
Board – State Water Control Board
Center - Langley Research Center
CGP – Construction General Permit (VAR10)
CPAR – Contractor Performance Assessment Reporting System
DEQ - Virginia Department of Environmental Quality
EMS – Environmental Management System
ESC - Erosion and Sediment Control
LaRC – Langley Research Center
LAPD – Langley Procedural Document
LDA – Land Disturbing Activity
LID – Low Impact Development
LPR – Langley Procedural Requirements
MS4 - Municipal Small Storm Sewer System
NASA - National Aeronautics and Space Administration
NPD – NASA Policy Directive
NPR – NASA Procedural Requirements
SPCC - Spill Prevention Control and Countermeasure
SPEEB – Standard Practice and Environmental Engineering Branch
SWM - Stormwater Management
SWPPP - Storm Water Pollution Protection Plan
VESCL&R - Virginia Erosion and Sediment Control Law and Regulations
VSMP - Virginia Stormwater Management Program
VPDES –Virginia Pollutant Discharge Elimination System

1.0 Introduction

NASA Langley Research Center has incorporated Annual Standards and Specifications for Erosion and Sediment Control (ESC) and Stormwater Management (SWM) that are integral components of LaRC's design, construction, maintenance, and management of the Center's facilities and operations. The primary regulatory driver for NASA LaRC Annual Standards and Specifications is the VSMP regulations (9 VAC 25-870), the General VPDES Permit for Discharges of Stormwater from Construction Activities (9 VAC 25-880/VAR10), Erosion and Sediment Control Law (9 VAC 25-840) and LaRC's MS4 permit (VAR040092). The *NASA LaRC Annual Standards and Specifications for ESC and SWM* submittal has been developed to provide detailed information regarding LaRC's compliance with all regulatory requirements.

NASA LaRC Annual Standards and Specifications for ESC and SWM shall be administered by the NASA LaRC Standard Practice and Environmental Engineering Branch (SPEEB) and shall apply to all design, construction, redevelopment and maintenance activities undertaken by LaRC, either by its internal workforce or contracted to external entities, where such activities are regulated by ESC and SWM regulations and EISA Section 438. These Standards and Specifications lay out the process for a successful and compliant project.

During any inspections of LaRC's land disturbing activities by DEQ, EPA or other environmental regulators, compliance with the approved *NASA LaRC Annual Standards and Specifications for ESC and SWM* (and all parts thereof), the Virginia ESC Law and Regulations, the Virginia SWM Act and the VSMP Permit Regulations will be expected.

NASA LaRC Annual Standards and Specifications for ESC and SWM are submitted to the DEQ for review and approval on an annual basis. NASA LaRC shall ensure that project specific plans are developed and implemented in accordance with these Annual Standards and Specifications. This submittal constitutes NASA LaRC's commitment to effective stormwater management.

2.0 NASA LaRC ESC and SWM Personnel

NASA SPEEB shall be the plan approving authority for land disturbing activities (LDA) at LaRC. The following is a breakdown in responsibilities and titles in regard to *NASA LaRC Annual Standards and Specifications for ESC and SWM* Responsibilities may be combined in terms of staffing resources only if the person responsible for the task(s) is qualified. Certifications shall be in accordance with the *Virginia Erosion and Sediment Control and Stormwater Management Certification Regulations* (9VAC25-850);

The following roles and responsibilities are designated to ensure compliance with *NASA LaRC Annual Standards and Specifications for ESC and SWM*:

2.1 SWM/ESC Annual Standards and Specifications Administrator (Administrator) shall have overall management and coordination responsibilities for the *NASA LaRC Annual Specifications for ESC and SWM*. This person will reside within NASA SPEEB. This person shall be at a minimum a DEQ dual-certified Program Administrator.

2.2 SWM/ESC Plan Reviewer (Reviewer) shall be responsible for reviewing plans to ensure compliance with the *NASA LaRC Annual Standards and Specifications for ESC and SWM* and applicable SW/ESC laws and regulations. The Reviewer shall be responsible to review and approve ESC Plan, SWM Plans, and SWPPPs. This person will reside within NASA SPEEB. This person shall be at a minimum a DEQ dual-certified Plan Reviewer.

2.3 SWM/ESC Inspector (Inspector) shall have the responsibility for inspecting erosion and sediment control practices to evaluate compliance with the approved Plans and associated laws, regulations, and the *NASA LaRC Annual Standards and Specifications for ESC and SWM*. The Inspector shall be responsible to inspect erosion and sediment control measures to ensure proper installation in accordance with the permitted plan and record the state and effectiveness of such measures in an effort maximize site erosion and sediment control. They shall also be responsible to inspect the construction and effectiveness of permanent stormwater management controls, verify that all required documents are available on-site for view/review, including but not limited to, land disturbance permit, permitted plans, inspections log, VSMP permits, SWPPP, etc. This person will reside within NASA SPEEB. This person shall be at a minimum a DEQ dual-certified Inspector.

2.4 Personnel certified as a dual Combined Administrator for ESC and SWM may serve the role of Administrator, Inspector and Plan Reviewer for ESC and SWM at NASA.
The following personnel are currently designated to ensure and verify compliance with erosion and sediment control and stormwater management regulations on all LaRC projects:

ESC Combined Administrator(s):
Peter Van Dyke, Certification # 6059 (Expires 5/31/2017)
757-864-7517
Peter.vandyke@nasa.gov

Todd Herbert, Certification # 6146 (Expires 11/30/2015)
757-864-6236
Brandon.t.herbert@nasa.gov

SWM Combined Administrator(s):
Peter Van Dyke, *Provisional SWM Certification*

- Attended Basic Stormwater Management on 6/10/2013
- Attended Inspector Stormwater Management on 2/19/2014
- Registered for Plan Reviewer Stormwater Management in September 2014

Todd Herbert, *Provisional SWM Certification*

- Attended Basic Stormwater Management on 7/30 – 7/30/13
- Attended Inspector Stormwater Management on 3/21/2014
- Registered for Plan Reviewer Stormwater Management in September 2014

3.0 LDA Project Requirements and Technical Criteria

3.1 *NASA LaRC Annual Standards and Specifications for ESC and SWM* are composed of general specifications. The following regulations and guidance documents have been incorporated by reference into *NASA LaRC Annual Standards and Specifications for ESC and SWM*. All parts of these incorporated regulations apply to LDAs at LaRC.

- Virginia Erosion and Sediment Control Regulations (9VAC25-840)
- Virginia Stormwater Management Program Regulations (9VAC25-870)
- Virginia Erosion and Sediment Control and Stormwater Management Certification Regulations (9VAC25-850)
- Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC 25-830)
- Virginia Erosion and Sediment Control Handbook, 1992, as amended
- Virginia Stormwater Management Handbook, 1999, as amended
- Virginia Erosion and Sediment Control Handbook, 3rd Edition, as amended
- Technical Bulletins, as amended, on DEQ website
- 40 CFR 450.21
- Langley Procedural Requirements 8500.1
- LaRC Master SPEC Section 01 35 40.00 41
- NASA LaRC Environmental Design Standards

Compliance with all of the regulations and documents listed above is required.

3.2 In addition to the *NASA LaRC Annual Standards and Specifications for ESC and SWM*, projects shall comply with NASA LaRC Environmental Master SPEC Section 01 35 40.00 41 and NASA LaRC Environmental Design Standards. These documents are incorporated by reference into *NASA LaRC Annual Standards and Specifications for ESC and SWM*. In combination, these documents guide NASA on proper ESC and SWM program implementation. The NASA LaRC Environmental Design Standards primarily apply to design aspects of projects. The NASA LaRC Master SPEC Section 01 35 40.00 41 applies primarily to construction activity contracts.

3.3 Any LDA over 2,500 square feet shall comply with *NASA LaRC Annual Standards and Specifications for ESC & SWM* as applicable. However, only LDAs disturbing more than one acre of land are required to obtain CGP coverage from DEQ.

3.4 For LDAs disturbing over 2,500 square feet, designs shall comply with *VSMP Regulations Part II B – Technical Criteria for Regulated Land-Disturbing Activities* (9VAC25-870-32 through 9VAC25-870-92).

3.5 Each LDA over 2,500 square feet or when deemed necessary by NASA SPEEB, shall prepare a site specific Erosion and Sediment Control (ESC) Plan that is compliant with the *Virginia Erosion and Sediment Control Regulations* (9VAC25-840). This plan must be approved by NASA SPEEB prior to any land disturbing work commencing or application for CGP coverage (for LDAs over 1 acre). More specific details on ESC plan requirements can be found in Section 4.1.

3.6 Each LDA over 2,500 square feet or when deemed necessary by NASA SPEEB, shall prepare a site specific Stormwater Management (SWM) Plan that is compliant with the *Virginia Stormwater Management Program (VSMP) Regulations* (9VAC25-870). This plan must be

approved by NASA SPEEB prior to any land disturbing work commencing or application for CGP coverage (for LDAs over 1 acre). Specific details on SWM plan requirements can be found in Section 4.2 and in the NASA Environmental Design Standards.

3.7 For LDAs disturbing over 1 acre of land, the activity requires coverage under the VA DEQ *General VPDES Permit fort Discharges of Stormwater from Construction* Activities (CGP/VAR10). It is the responsibility of the Contractor to apply for the CGP coverage. The Permit will be issued in their name as the construction operator and they responsible for all fees.

The CGP requires the construction site operator to develop and implement a site specific Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must be prepared and approved by NASA prior to submitting a registration statement for permit coverage to DEQ. The SWPPP is to be retained at the construction site along with a copy of the permit and permit coverage letter. The operator has the lead in developing, implementing and maintaining the SWPPP and committing the resources necessary to prevent pollution.

3.8 Construction operators (contractors) must utilize responsible personnel and obtain certifications or qualifications for erosion and sediment control and stormwater management comparable to those required for NASA. At a minimum, operators shall have a certified Responsible Land Disturber (RLD) on staff. Prior to engaging in a LDA, the Operator must provide NASA the name of the individual holding a valid RLD Certificate who will be responsible for the land disturbance. This information and a copy of the RLD certificate is also required in the SWPPP submittal.

4.0 ESC Plan, SWM Plan, P2 Plan and SWPPP Requirements

The following provides information and requirements on Plan submittals required for compliance with ESC and SWM requirements and regulations. These Plans are required for any LDA disturbing more than 2,500 square feet of land.

4.1 Erosion and Sediment Control Plan

4.1.1 An ESC plan consistent with the requirements of the Virginia Erosion and Sediment Control Law and regulations must be designed and implemented during construction activities. The ESC plan must clearly show compliance with the state's 19 minimum standards listed in 9 VAC 25-840-40. The ESC must also provide information on the Operator's RLD. Prior to land disturbance, this plan must be approved by NASA SPEEB. Please see Section 5.0 for details on the Plan review and approval process.

4.1.2 ESC practices selected for use shall be designed and installed in accordance with the Virginia Erosion and Sediment Control Handbook, 3rd Edition (as amended).

4.1.3 An ESC Plan shall adequately cover the following:

- Control of the volume and velocity of stormwater runoff within the site to minimize soil erosion;
- Control of the stormwater discharges, including peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion;
- Minimizes the amount of soil exposed during the construction activity;
- Minimizes the disturbance of steep slopes;
- Minimizes sediment discharges from the site in a manner that addresses (i) the amount, frequency, intensity, and duration of precipitation; (ii) the nature of resulting stormwater runoff; and (iii) soil characteristics, including the range of soil particle sizes present on the site;
- Provides and maintains natural buffers around surface waters, directs stormwater to vegetated areas to increase sediment removal, and maximizes stormwater infiltration, unless infeasible;
- Minimizes soil compaction and, unless infeasible, preserves topsoil;
- Ensures that stabilization of disturbed areas will be initiated immediately whenever any clearing, grading, excavating, or other land-disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 days; and
- Utilizes outlet structures that withdraw stormwater from the surface (i.e., above the permanent pool or wet storage water surface elevation), unless infeasible, when discharging from sediment basins or sediment traps.

4.2 Stormwater Management Plan

4.2.1 A stormwater management plan consistent with the requirements of the Virginia Stormwater Management Act and regulations, in particular *Part II B – Technical Criteria for Regulated Land-Disturbing Activities* (9VAC 25-870-32 through 9VAC 25-870-92), must be designed prior to construction and implemented during construction. Prior to land disturbance, this Plan must be approved by NASA SPEEB. Please see Section 5.0 for details on the Plan review and approval process.

A complete SWM Plan shall include the following elements:

- Information on the type of and location of stormwater discharges, information on the features to which stormwater is being discharged including surface waters or karst features if present, and pre-development and post-development drainage areas;
- Contact information including the name, address, telephone number, and email address of the owner;
- A narrative that includes a description of current site conditions and final site conditions;
- A description of the proposed stormwater management facilities and the mechanism through which the facilities will be operated and maintained after construction;
- Information on the proposed stormwater management facilities, including the type of facilities; location including geographic coordinates; acres treated; and the surface waters into which the facility will discharge;
- Hydrologic and hydraulic computations, including runoff characteristics;
- Documentation and calculations verifying compliance with the water quality and quantity requirements (Part II B of the regulations) of these regulations;
- A map or maps of the site that depicts the topography of the site and includes: (a) All contributing drainage areas; (b) Existing streams, ponds, culverts, ditches, wetlands, other water bodies, and floodplains, (c) Soil types, geologic formations if karst features are present in the area, forest cover, and other vegetative areas; (d) Current land use including existing structures, roads, and locations of known utilities and easements; (e) Sufficient information on adjoining parcels to assess the impacts of stormwater from the site on these parcels; (f) The limits of clearing and grading, and the proposed drainage patterns on the site; (g) Proposed buildings, roads, parking areas, utilities, and stormwater management facilities; and (h) Proposed land use with tabulation of the percentage of surface area to be adapted to various uses, including but not limited to planned locations of utilities, roads, and easements.
- If an operator intends to meet the requirements established in 9VAC25-870-63 or 9VAC25-870-66 through the use of off-site compliance options, where applicable, then a letter of availability from the off-site provider must be included.

4.2.2 Compliance with the water quality design criteria set in 9 VAC 25-870-63 shall be determined by utilizing the Virginia Runoff Reduction Method (VRRM). The BMPs approved in 9 VAC 25-870-65 and listed in the Virginia Stormwater BMP Clearinghouse Website are approved for use as ways to reduce the phosphorus load and runoff volume in accordance with the VRRM.

4.2.3 Elements of the stormwater management plans that include activities regulated under Chapter 4 (§ 54.1-400 et seq.) of Title 54.1 of the Code of Virginia shall be appropriately sealed and signed by a professional registered in the Commonwealth of Virginia pursuant to Article 1 (§ 54.1-400 et seq.) of Chapter 4 of Title 54.1 of the Code of Virginia.

4.3 Pollution Prevention Plan

4.3.1 A P2 Plan that identifies potential sources of pollutants that may reasonably be expected to affect the quality of stormwater discharges from the construction site and describe control measures that will be used to minimize pollutants in stormwater discharges from the construction site must be developed before land disturbance. This Plan shall be included in the larger SWPPP submittal.

4.3.2 At a minimum, the P2 Plan must be designed, installed, implemented, and maintained to: (1) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that

provides equivalent or better treatment prior to discharge; (2) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater; and (3) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

4.3.3 The P2 plan shall include effective best management practices to prohibit the following discharges in accordance with 40 CFR 450.21(e): (1) Wastewater from washout of concrete, unless managed by an appropriate control; (2) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials; (3) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and (4) Soaps or solvents used in vehicle and equipment washing.

4.3.4 Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls. LPR 8500.1 and Master SPEC Section 01 35 40.00 provide additional detail on prohibited illicit discharges.

4.4 Stormwater Pollution Prevention Plan (SWPPP) Requirements

4.4.1 All SWPPPs shall be compliant with 9VAC25-870-54 and 9 VAC 25-880-70 (as applicable). A SWPPP shall include, but not be limited to, an approved ESC plan, an approved SWM plan, a P2 plan for regulated land-disturbing activities, and a description of any additional control measures necessary to address a TMDL.

4.4.2 The SWPPP requirements may be fulfilled by incorporating by reference other plans such as (i) an ESC plan, (ii) an agreement in lieu of a plan as defined in 9VAC25-840-10, (iii) a SWM plan, (iv) a SPCC plan developed for the site under § 311 of the federal Clean Water Act or (v) BMP programs otherwise required for the facility provided that the incorporated plan meets or exceeds the SWPPP requirements.

4.4.3 All plans incorporated by reference into the SWPPP become enforceable by NASA LaRC and DEQ. If a plan incorporated by reference does not contain all of the required elements of the SWPPP of Section II D, the operator must develop the missing elements and include them in the required SWPPP.

5.0 NASA Administration and Implementation: Project Approval Process

The following section outlines the process for a compliant project at LaRC and the administrative process used by NASA. This section details how LaRC manages a project from cradle to grave in regards to ESC and SWM.

5.1 Langley Form (LF) 416 – Environmental Review

5.1.1 Any land disturbing work over 2,500 square feet must be coordinated through SPEEB and approved by the ESC and SWM Combined Administrator. To initiate this process a Langley Form (LF) 461 should be submitted to SPEEB at the earliest planning stages by the project requestor.

The LF 461 submittal shall provide a basic scope of work, an estimate of the amount of land disturbance, information on potential changes to drainage, and a preliminary site work location map. NASA SPEEB will provide feedback and guidance on the applicability of the *NASA LaRC Annual Standards and Specifications for SWM and ESC* and other regulations. Guidance will be given on the applicability of Plans, CGP coverage, and project expectations.

5.2 Project Planning and Design

5.2.1 It is the responsibility of NASA SPEEB to ensure that appropriate requirements including, but not limited to, the *NASA LaRC Annual Standards and Specifications for SWM and ESC*, Environmental SPEC Section 01 35 40.00 41, Virginia Regulations, and NASA Environmental Design Standards are implemented into project requirements and ultimately into contract award packages and RFPs for bids.

5.2.2 To ensure projects are designed in accordance with VA regulations, SPEEB shall participate in the NASA Design Review Process. The design review process shall follow Langley Procedural Document (LAPD) 7000.2. This LAPD specifically outlines NASA's various preconstruction design reviews and design process. SPEEB shall participate and provide ESC and SWM guidance during the following design reviews:

- Project Requirements Review (PRR)
- Conceptual Design Reviews (CoDR)
- Preliminary Design Reviews (PDR)
- Critical Design Reviews (DCR)
- Design Charrettes
- 35%, 90%, and 100% Design Table Tops
- Integrated Systems Review (ISR)
- Operational Readiness Review (ORR)

5.3 Preconstruction Project Submittals

5.3.1 All required submittals shall be submitted to the Contracting Officer for NASA SPEEB review and approval prior to any LDAs. Submittals timeframes are project specific. Below are the typical required submittals expected to be completed for each project; however, exact composition of submittals is project specific and guidance will be given during the LF 461 process and built into the project bid package.

- LF 461 Submittal
- ESC Plan
- SWM Plan
- P2 Plan
- SWPPP
- Stamped/Signed (by a licensed Professional Engineer) Civil Plans and Profiles
- Copy of Completed VSMP Permit Application and check
- Vicinity Map
- Construction Schematics
- Dig Permit
- Virginia Runoff Reduction Method Analysis
- CGP Registration Statement

Prior to commencement of a LDA, the project must have received approval for all applicable Plan(s) from NASA SPEEB's Plan Reviewer. Please see section 5.4 for more information on Plan reviews.

5.4 Plan Reviews

5.4.1 Plan reviews shall be conducted by qualified personnel as detailed in Section 2.1. Plan reviews shall ensure compliance with the *NASA LaRC Annual Specifications for ESC and SWM* and all applicable regulations. Plan reviewers shall use the *ESC and SWM Plan Review Checklists* provided in the Appendix A and B respectively. The Plan Reviewer shall have 15 days to review a submittal and provide written comments.

5.4.2 Accepted Plans: Should a Plan be accepted and approved by NASA SPEEB, then the contractor may proceed with obtaining CGP coverage from DEQ (for projects 1 acre or greater) or begin implementing Plans (for projects 2,500 square feet to .99 acres).

Upon approval, the contractor shall submit at least (3) unmarked Plan sets. These plan sets are allocated as follows: (1) for NASA SPEEB records, (1) for the Project Inspector and (1) for the Contractor (Operator). Additional copies may be requested as needed. The Contractor's copy is considered a living document (especially for ESC and SWPPP Plans) that should be updated throughout the project as needed.

5.4.2 Rejected Plans: Should a Plan be rejected for rework, the Plan Reviewer shall state in writing the reason(s) for disapproval of a Plan and specify the modifications, terms, and conditions necessary for Plan approval. The re-submission should address all of the Plan Reviewer's comments. Once resubmitted to NASA SPEEB, the Plan Reviewer has an additional 15 days to provide approval or additional comments. LDAs may not occur during this time. This process continues until all Plans obtain the necessary approvals.

5.5 CGP Coverage and Termination

5.5.1 LDAs between 2,500 square feet to 0.99 acres do not require DEQ CGP coverage (after 1 July 2014). However, these LDAs still require SWM and ESC Plan approval prior to land disturbance work commencing.

5.5.2 LDAs over one (1) acre require DEQ CGP coverage. More information, including access to the DEQ Registration Statement Form, the CGP (VAR10), and the CGP fee schedule, can be found here:

http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/VSMPPermits/ConstructionGeneralPermit.aspx

The contractor is responsible for submitting a correct Registration Statement and fee to DEQ for CGP coverage. NASA SPEEB will review the form prior to submittal to the DEQ.

5.5.3 The Contractor is responsible for terminating coverage once NASA SPEEB verifies that the site is 100% stabilized and the necessary SWM records (drawings, etc.) are recorded and the permanent SWM controls are functioning. Contractors should request a SPEEB site inspection once the site is considered complete. SPEEB will visit the site and either (1) grant permission for CGP termination to DEQ or (2) specify what work or conditions are needed prior to termination. The notice of termination should be submitted no later than 30 days from NASA SPEEB approval. Completion of the project is defined as the achievement of final stabilization, not completion of construction.

5.6 Post-construction Submittals

5.6.1 A copy of the Operator's DEQ CGP termination letter shall be submitted to NASA SPEEB once received. SPEEB will file the termination letter appropriately into the project file.

5.6.2 A construction record drawing for permanent stormwater management facilities shall be submitted to the NASA Contracting Officer. The construction record drawing shall be appropriately sealed and signed by a professional registered in the Commonwealth of Virginia, certifying that the stormwater management facilities have been constructed in accordance with the approved SWM Plan.

6.0 NASA Administration and Implementation: Inspections

6.1 NASA ("VSMP Authority") and MS4 Oversight Inspections

6.1.1 NASA SPEEB, acting as the VSMP authority by way of these Standards and Specifications and as the MS4 Owner, inspects LDAs during construction and post-construction. NASA Inspectors ensure:

- Installation of ESC measures;
- Compliance with the 19 Minimum Standards (9 VAC 25-840-40);
- Implementation and compliance with any approved ESC Plan and SWPPP;
- Implementation and compliance with any approved SWM plan;
- Implementation and compliance with any approved P2 Plan;
- Development and implementation of any additional control measures necessary to address a TMDL; and
- Installation and construction of SWM facilities.

6.1.2 NASA SPEEB shall inspect LDAs for compliance with any approved Plan and with these Annual Standards and Specifications. NASA SPEEB shall inspect as follows:

- Upon initial installation of erosion and sediment controls;
- At least once during every two-week period;
- Within 48 hours of any runoff-producing storm event; and
- Upon completion of the project and prior to the release of any applicable performance bonds.

6.1.3 NASA Inspectors shall be qualified and certified personnel. Please refer to Section 2.3 for more information. The Certified Inspector(s) are responsible for ensuring that the construction and installation of all structural and non-structural controls are in accordance with the project's ESC and SWM plans and intention. All erosion and sediment control structures and systems are to be inspected. Maintenance and repairs shall be documented and delivered to the appropriate parties to ensure continued performance of their intended function.

6.1.4 For NASA ESC and SWM Inspections, the *Stormwater Construction Inspection Report form,* provided in Appendix C, shall be used on each site inspection visit. All measures shown or discussed in the ESC and SWPPP shall be inspected. A copy of the Inspection Report will be provided to the NASA Project Manager and the Prime Contractor and archived by NASA SPEEB.

6.2 Contractor ("Operator") CGP Required Inspections

6.2.1 The CGP requires inspections for compliance with the approved SWPPP and to ensure that ESC controls are in place and functioning. Inspections mandated by the CGP are to be performed and recorded by the Permit Operator ("the contractor").

6.2.2 Permit Operator inspections shall be conducted at a frequency of at least once every five business days; or at least once every 10 business days and no later than 48 hours following a measurable storm event. In the event that a measurable storm event occurs when there are more than 48 hours between business days, the inspection shall be conducted no later than the next business day.

6.2.3 Each inspection report shall include the following items:

- The date and time of the inspection and when applicable, the date and rainfall amount of the last measurable storm event;
- Summarized findings of the inspection;
- The location(s) of prohibited discharges;
- The location(s) of control measures that require maintenance;
- The location(s) of control measures that failed to operate as designed or proved inadequate or inappropriate for a particular location;
- The location(s) where any evidence identified under CGP Part II F 3 a (7) exists;
- The location(s) where any additional control measure is needed that did not exist at the time of inspection;
- A list of corrective actions required (including any changes to the SWPPP that are necessary) as a result of the inspection or to maintain permit compliance;
- Documentation of any corrective actions required from a previous inspection that have not been implemented; and
- The date and signature of the qualified personnel and the operator or its duly authorized representative.

6.2.4 The CGP details the inspection requirements in Part II F (3). These inspection requirements should be met by the Operator.

6.2.5 For sites with CGP coverage, specific Contractor inspections requirements can be found in the CGP (VAR 10) Part II F.

6.2.6 During SWPPP review and approval, NASA will verify that a quality inspection form and tracking system is in place for each LDA.

7.0 NASA Administration and Implementation: Violations, Corrective Actions, and Enforcement

7.1 Inspections are done in accordance with Section 6.0 of this document. Should an inspector find a violation, the Project Manager, Contracting Officer, and contractor are notified immediately via email and/or phone. Violations will be documented and delivered to the Project Manager and Permit Operator with a copy of the corresponding *Stormwater Construction Inspection Report form* and *Corrective Action Notice* (provided in Appendix). Any violation reported will include photographs, descriptions, and necessary corrective actions (including timelines for correction).

The Operator shall implement any corrective action(s) identified as a result of an inspection as soon as practicable but no later than seven days after discovery. A longer corrective action timeframe must be approved by NASA SPEEB. If approval of a corrective action by NASA SPEEB is necessary, additional control measures shall be implemented to minimize pollutants in stormwater discharges until such approvals can be obtained.

7.2 Potential ESC and SWM violations include, but are not limited to:

- No CGP coverage for sites over 1 acre;
- No SWPPP; Incomplete SWPPP; and/or SWPPP not available for review;
- No approved ESC plan;
- Failure to install stormwater BMPs or erosion and sediment controls;
- Stormwater BMPs or erosion and sediment controls improperly installed or maintained;
- Slow contractor response to NASA ESC and SWM findings;
- Operational deficiencies;
- Failure to conduct required inspections;
- Incomplete, improper, or missed inspections.

7.3 For minor deficiencies with no environmental impacts the contractor may remedy the violation immediately and avoid a formal *Corrective Action Notice* being issued. However, an inspection report with photos documenting the deficiency and repairs made will still be placed in the project folder.

Examples of minor deficiencies include, but are not limited to:

- Inlet protection needing maintenance/cleanout, but the BMP is still functioning;
- Silt fence sagging, but BMP is still functioning;
- CGP Coverage letter not posted at project site.

If the minor deficiency is not remedied immediately, a formal *Corrective Action Notice* will be issued to the Contractor. In no circumstance should a corrective action take more than 7 days. If rain is expected and a potential discharge may occur, corrective action needs to be taken immediately.

7.4 For deficiencies that have the potential for environmental harm a formal *Corrective Action Notice* will be issued with the corresponding inspection report. Examples of these deficiencies include, but are not limited to:

- Silt fence not installed in accordance with an approved Plan;
- Improper dewatering devices;

- Unprotected inlets or inadequate controls;
- SWPPP paperwork deficiencies;
- Lack of inspection records.

7.5 If a deficiency damaging the environment occurs (ex. illicit discharge of sediment laden water) or minor deficiencies continue to reoccur, then a formal contractual action will be taken through the Contracting Officer. Formal contractual actions (as provided in the FAR) can include, but are not limited to, cure notices, formal contract non-conformance notices, stop work orders, withholding of payment, negative evaluation reports in formal systems such as Federal Government's Contractor Performance Assessment Reporting System (CPAR) and/or contract termination.

7.6 At the discretion of NASA and in coordination with DEQ, the CGP may be suspended and/or revoked; at which time all LDAs must cease until the violation(s) of the plan or permit has ceased, corrective action completed, and any related environmental or property damages abated. Alternatively, NASA also has the option to contract with a 3rd party to install and maintain the ESC and SWM measures in accordance with the approved plan(s), complete any necessary corrective actions, and abate any related damages. Once the site is stabilized to the satisfaction of the NASA SPEEB, site work may resume.

8.0 NASA Administration and Implementation: Changes to Approved Plans

8.1 NASA SPEEB may require that an approved plan be changed in the following cases:

- Where inspection has revealed the plan is inadequate to satisfy applicable regulations; or
- Where the person responsible for carrying out the approved Plan(s) finds that such Plan(s) is no longer effective due to field conditions and/or changes to the overall project scope. In such case, an amended plan must be promptly proposed.

8.2 Revisions to an approved ESC and/or SWM plan must be submitted in writing to NASA SPEEB. Revisions shall not be considered approved until written notice is provided. All revisions must be clearly marked in red. Revisions must comply with the *NASA LaRC Annual Standards and Specifications for ESC and SWM*. Exceptions may be allowed in the event of an emergency.

8.3 The Contractor is responsible for the performance of the ESC measures. If the designated ESC measures prove to be inadequate, the Contractor is responsible to reassess, design, and submit a plan amendment at no cost to the NASA LaRC.

9.0 NASA Administration and Implementation: Variances

9.1 NASA SPEEB may waive or modify any of the requirements that are deemed inappropriate or too restrictive for site conditions, by granting a variance. A variance may be granted under these conditions:

- At the time of plan submission, an operator may request a variance to become part of the approved ESC plan. The operator shall explain the reasons for requesting variances in writing. Specific variances which are allowed by NASA SPEEB shall be documented in the plan. This request must include a detailed description of the alternative SWM/ESC practice and justification that the practice meets the intent of the state's 19 Minimum Standard for which the variance is sought.

- During construction, the person responsible for implementing the approved plan may request a variance in writing from NASA SPEEB. NASA SPEEB shall respond in writing either approving or disapproving such a request. If NASA SPEEB does not approve a variance within 10 days of receipt of the request, the request shall be considered to be disapproved. Following disapproval, the operator may resubmit a variance request with additional documentation.

NASA SPEEB shall consider variance requests judiciously, keeping in mind both the need of the applicant to maximize cost effectiveness and the need to protect off-site properties and resources from damage.

9.2 Variances to regulations must ensure off-site properties and resources are protected from damage. Economic hardship is not sufficient reason to request a variance.

9.3 All approved variances shall be listed in the General Notes section of the SWM and ESC plans for land disturbing activities and included in the narrative.

10.0 Long-term Management of Stormwater Management Control Devices

This section discusses NASA's provisions for the long-term responsibility and maintenance of SWM control devices and other facilities specified to manage the quantity and quality of runoff, including an inspection and maintenance schedule ensure the long-term success of SWM facilities.

10.1 Post-construction inspections shall be made in accordance with the manufacturer's and/or engineer's recommendation, the provisions of these Standards and Specifications, in accordance with the approved SWM Plan, and in accordance with NASA's MS4 Program Plan.

At a minimum, NASA SPEEB shall inspect all SWM facilities at least annually. This is in accordance with requirements of NASA LaRC's MS4 permit.

10.2 Inspections shall include a Plan review prior to site visit, a field visit with photographs, and a completed SWM Facility inspection report form. Inspectors will look for proper drainage and erosion issues (such as scouring, rill erosion, etc.).

A copy of the SWM Facility inspection report form can be found in Appendix D.

10.3 Once the inspection has been completed, NASA SPEEB will compile the report and any issues that need attention. The field inspection report and a summary of the issues will be forwarded to the appropriate entity (such as COD, Grounds Maintenance, Facility Coordinator, etc.) for corrective action(s). For significant corrections (non-routine), NASA SPEEB may have to advocate for funding to address the issue properly. Documentation on all corrective actions will be kept on file with NASA SPEEB.

11.0 Land Disturbing Activities and Project Tracking

11.1 NASA SPEEB tracks all regulated (and non-regulated) LDAs. A copy of the historical and active site tracking log can be found in Appendix F. A "live" version of this log is kept with NASA SPEEB and updated as needed. This tracking log will be submitted annually to DEQ along with this document. As discussed before, projects are also tracked in the LF 461 environmental tracking system. Each project has an associated unique LF 461 number and file that is updated and maintained throughout the project.

11.2 A list of regulated land-disturbing activities expected to be under contract at NASA has been submitted in Appendix G. The list includes project description, estimated coverage date, estimated disturbed acreage by watershed, and status/notes. Information on specific land-disturbing activities not included on the list will be provided to DEQ no less than two weeks prior to the start of the activity.

12.0 Annual Standards and Specifications Review and Evaluation

12.1 NASA shall submit an updated version of the *Standards and Specifications for ESC and SWM* to DEQ annually. The timeframe for this submittal is contingent upon this first version being approved by DEQ.

12.2 DEQ shall have sixty days in which to review/comment/disapprove/approve *NASA's Annual Standards and Specifications for ESC and SWM.* DEQ's comments shall be binding to NASA and any contractor working at NASA.

13.0 Definitions

"Best management practice" or "BMP" means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices, including both structural and nonstructural practices, to prevent or reduce the pollution of surface waters and groundwater systems.

"Board" means the State Water Control Board.

"Certified combined administrator for ESC" means a LaRC employee who holds a certificate of competence from the Board in the combined ESC classifications of program administrator, plan reviewer, and project inspector in the area of ESC.

"Certified combined administrator for SWM" means a LaRC employee who holds a certificate of competence from the board in the combined classifications of program administrator, plan reviewer, and project inspector in the area of SWM.

"Classification" means the four specific certificate of competence classifications within the areas of ESC or SWM that make up activities being performed (program administrator, plan reviewer, project inspector, and combined administrator).

"Clean Water Act" or "CWA" means the federal Clean Water Act (33 USC § 1251 et seq.), formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483, and Public Law 97-117, or any subsequent revisions thereto.

"Combined administrator for ESC" means anyone who is responsible for performing the combined duties of a program administrator, plan reviewer and project inspector of a VESCP authority.

"Combined administrator for SWM" means anyone who is responsible for performing the combined duties of a program administrator, plan reviewer and project inspector of a VSMP authority.

"Construction activity" means any clearing, grading or excavation associated with large construction activity or associated with small construction activity.

"Discharge," when used without qualification, means the discharge of a pollutant.

"Discharge of a pollutant" means:

1. Any addition of any pollutant or combination of pollutants to state waters from any point source; or

2. Any addition of any pollutant or combination of pollutants to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation.

This definition includes additions of pollutants into surface waters from: surface runoff that is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a state, municipality, or other person that do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any indirect discharger.

"Erosion and Sediment Control Plan" or "plan" means a document containing material for the conservation of soil and water resources of a unit or group of units of land. It may include appropriate

maps, an appropriate soil and water plan inventory and management information with needed interpretations, and a record of decisions contributing to conservation treatment. The plan shall contain all major conservation decisions and all information deemed necessary by the plan-approving authority to assure that the entire unit or units of land will be so treated to achieve the conservation objectives.

"Land disturbance" or "land-disturbing activity" means a manmade change to the land surface that potentially changes its runoff characteristics including clearing, grading, or excavation, except that the term shall not include those exemptions specified in § 62.1-44.15:34 of the Code of Virginia.

"Linear development project" means a land-disturbing activity that is linear in nature such as, but not limited to, (i) the construction of electric and telephone utility lines, and natural gas pipelines; (ii) construction of tracks, rights-of-way, bridges, communication facilities and other related structures of a railroad company; (iii) highway construction projects; (iv) construction of stormwater channels and stream restoration activities; and (v) water and sewer lines. Private subdivision roads or streets shall not be considered linear development projects.

"Maximum extent practicable" or "MEP" means the technology-based discharge standard for municipal separate storm sewer systems established by CWA § 402(p). MEP is achieved, in part, by selecting and implementing effective structural and nonstructural best management practices (BMPs) and rejecting ineffective BMPs and replacing them with effective best management practices (BMPs). MEP is an iterative standard, which evolves over time as urban runoff management knowledge increases. As such, the operator's MS4 program must continually be assessed and modified to incorporate improved programs, control measures, BMPs, etc., to attain compliance with water quality standards.

"Municipal separate storm sewer system" or "MS4" means all separate storm sewers that are defined as "large" or "medium" or "small" municipal separate storm sewer systems or designated under 9VAC25-870-380 A 1.

"Municipal Separate Storm Sewer System Management Program" or "MS4 Program" means a management program covering the duration of a state permit for a municipal separate storm sewer system that includes a comprehensive planning process that involves public participation and intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the CWA and regulations and the Act and attendant regulations, using management practices, control techniques, and system, design and engineering methods, and such other provisions that are appropriate.

"Operator" means the owner or operator of any facility or activity subject to the Act and this chapter. In the context of stormwater associated with a large or small construction activity, operator means any person associated with a construction project that meets either of the following two criteria: (i) the person has direct operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications or (ii) the person has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a stormwater pollution prevention plan for the site or other state permit or VSMP authority permit conditions (i.e., they are authorized to direct workers at a site to carry out activities required by the stormwater pollution prevention plan or comply with other permit conditions).

"Outfall" means, when used in reference to municipal separate storm sewers, a point source at the point where a municipal separate storm sewer discharges to surface waters and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other surface waters and are used to convey surface waters.

"Postdevelopment" refers to conditions that reasonably may be expected or anticipated to exist after completion of the land development activity on a specific site.

"Predevelopment" refers to the conditions that exist at the time that plans for the land development of a tract of land are submitted to the VSMP authority. Where phased development or plan approval occurs (preliminary grading, demolition of existing structures, roads and utilities, etc.), the existing conditions at the time prior to the first item being submitted shall establish predevelopment conditions.

"Prior developed lands" means land that has been previously utilized for residential, commercial, industrial, institutional, recreation, transportation or utility facilities or structures, and that will have the impervious areas associated with those uses altered during a land-disturbing activity.

"Runoff coefficient" means the fraction of total rainfall that will appear at a conveyance as runoff.

"Runoff" or "stormwater runoff" means that portion of precipitation that is discharged across the land surface or through conveyances to one or more waterways.

"Runoff characteristics" includes maximum velocity, peak flow rate, volume, and flow duration.

"Runoff volume" means the volume of water that runs off the site from a prescribed design storm.

“Site" means the land or water area where any facility or land-disturbing activity is physically located or conducted, including adjacent land used or preserved in connection with the facility or land-disturbing activity. Areas channelward of mean low water in tidal Virginia shall not be considered part of a site.

"Site hydrology" means the movement of water on, across, through and off the site as determined by parameters including, but not limited to, soil types, soil permeability, vegetative cover, seasonal water tables, slopes, land cover, and impervious cover.

"Stormwater management facility" means a control measure that controls stormwater runoff and changes the characteristics of that runoff including, but not limited to, the quantity and quality, the period of release or the velocity of flow.

"Stormwater management plan" means a document(s) containing material for describing methods for complying with the requirements of the VSMP or this chapter.

"Stormwater Pollution Prevention Plan" or "SWPPP" means a document that is prepared in accordance with good engineering practices and that identifies potential sources of pollutants that may reasonably be expected to affect the quality of stormwater discharges. A SWPPP required under a VSMP for construction activities shall identify and require the implementation of control measures, and shall include, but not be limited to the inclusion of, or the incorporation by reference of an approved erosion and sediment control plan, an approved stormwater management plan, and a pollution prevention plan.

"Surface waters" means:

1. All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide;

2. All interstate waters, including interstate wetlands;

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (a) That are or could be used by interstate or foreign travelers for recreational or other

purposes; (b) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (c) That are used or could be used for industrial purposes by industries in interstate commerce.

4. All impoundments of waters otherwise defined as surface waters under this definition;

5. Tributaries of waters identified in subdivisions 1 through 4 of this definition;

6. The territorial sea; and

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in subdivisions 1 through 6 of this definition.

"Total maximum daily load" or "TMDL" means the sum of the individual wasteload allocations for point sources, load allocations (LAs) for nonpoint sources, natural background loading and a margin of safety. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. The TMDL process provides for point versus nonpoint source trade-offs.

"Virginia Pollutant Discharge Elimination System (VPDES) permit" or "VPDES permit" means a document issued by the State Water Control Board pursuant to the State Water Control Law authorizing, under prescribed conditions, the potential or actual discharge of pollutants from a point source to surface waters.

"Virginia Stormwater Management Act" means Article 2.3 (§ 62.1-44.15:24 et seq.) of Chapter 3.1 of Title 62.1 of the Code of Virginia.

"Virginia Stormwater BMP Clearinghouse Website" means a website that contains detailed design standards and specifications for control measures that may be used in Virginia to comply with the requirements of the Virginia Stormwater Management Act and associated regulations.

"Virginia Stormwater Management Handbook" means a collection of pertinent information that provides general guidance for compliance with the Act and associated regulations and is developed by the department with advice from a stakeholder advisory committee.

"Virginia Stormwater Management Program" or "VSMP" means a program approved by the board after September 13, 2011, that has been established by a VSMP authority to manage the quality and quantity of runoff resulting from land-disturbing activities and shall include such items as local ordinances, rules, permit requirements, annual standards and specifications, policies and guidelines, technical materials, and requirements for plan review, inspection, enforcement, where authorized in the Act and associated regulations, and evaluation consistent with the requirements of the SWM Act and associated regulations.

APPENDIX A: ESC Plan Review Checklist

REVIEW CHECKLIST

EROSION AND SEDIMENT CONTROL PLAN

ESC General:

	YES	NO
Title Page including Project, Contract Number, and Date.	☐	☐
Certification Statement Signed by an Officer of the Company?	☐	☐
Plan signed off by all subcontractors?	☐	☐
Responsible Land-Disturber Certificate Included?	☐	☐

ESC Narrative:

Detailed description of construction activities?	☐	☐
Site description (i.e. location, type of ground cover, etc.)?	☐	☐
Site location map?	☐	☐
Estimated area to be disturbed?	☐	☐
Construction sequence/ schedule of land-disturbing activities?	☐	☐
Pre and post stormwater runoff coefficients?	☐	☐
Name and location of receiving waters and tributaries?	☐	☐
Location of wetlands or other sensitive habitat within the project?	☐	☐

ESC Potential Pollution Sources:

Aboveground storage tanks addressed?	☐	☐
List of chemicals, petroleum products provided?	☐	☐
Sanitary waste facilities addressed?	☐	☐
Vehicle maintenance addressed?	☐	☐

ESC Best Management Practices (BMPs):

Description, type, and schedule of stabilization practices?	☐	☐

Description and type of structural BMPs (i.e. silt fence, check dams, inlet protection, sediment traps/basins, construction entrances, gabions, etc.) provided?

	☐	☐
Soil stockpile stabilization addressed?	☐	☐

ESC Operational Practices (Good Housekeeping):

Solid waste management addresses?	☐	☐
Dust suppression addressed?	☐	☐
Sediment tracking on roads addressed?	☐	☐

Inspection and Maintenance of BMPs:

Provided a plan for inspecting and maintaining the BMPs?	☐	☐
Designated a qualified individual to inspect all BMPs?	☐	☐
Included name and telephone number for the qualified person?	☐	☐
Example of BMP inspection checklist included?	☐	☐

Detailed Maps:

Soil disturbance areas shown?

APPENDIX B: SWM Plan Review Checklist

REVIEW CHECKLIST

STORMWATER MANAGEMENT PLAN

SWM General:

	YES	NO
Title Page including Project, Contract Number, and Date?	☐	☐
Virginia Professional Engineer Seal?	☐	☐
Appropriate technical criteria to the entire LDA?	☐	☐
Location of all SW discharges?	☐	☐
Narrative of final site conditions and VSMP authority?	☐	☐
Detailed site description (i.e. location, type of ground cover)?	☐	☐
Site location map, acres treated, SWM facility descriptions?	☐	☐
Hydrologic and hydraulic calculations (VRRM)?	☐	☐
Compliance calculations for water quality and quantity (IIb)?	☐	☐
Limits of clearing and grading?	☐	☐
Information on adjoining parcels?	☐	☐
Location of wetlands or other sensitive habitat within the project?	☐	☐
Post construction maintenance requirements?	☐	☐
Designated a qualified individual to inspect all BMPs?	☐	☐
Included name and telephone number for the qualified person?	☐	☐

APPENDIX C: NASA ESC Inspection Report Form

Stormwater Construction Site Inspection Report

General Information			
Project Name			
Tracking No.		Location	
Date of Inspection		Start/End Time	/
Inspector's Name(s)			
Describe present phase of construction			

Type of Inspection:

Inspection Schedule

❑ Upon initial installation of erosion & sediment controls ❑ At least once during every two-week period

❑ Within 48 hours of any runoff-producing storm event ❑ Upon completion of the project

Weather Information

Has there been a storm event since the last inspection? ❑ Yes ❑ No

Weather at time of this inspection?

❑ Clear ❑ Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snowing ❑ High Winds

❑ Other: Temperature:

❑ Records and Field Inspection ❑ Field Inspection Only

Maintaining and Updating SWPPP Compliance

Is the SWPPP retained, along with a copy of state's permit, registration statement, and acknowledgement letter from DCR, at the construction site or other location easily accessible during normal business hours? ❑ Yes ❑ No

Is the following information posted conspicuously near the main entrance of the construction site:

- A copy of the permit coverage letter including the registration number for the construction activity ❑ Yes ❑ No
- The location of the SWPPP (or internet address for an electronic version) ❑ Yes ❑ No
- The name and telephone number of a contact person for scheduling SWPPP viewing times? ❑ Yes ❑No

Have any design changes to the construction project been needed? ❑ Yes ❑ No

If yes, has the SWPPP been updated and the date of the SWPPP update logged? ❑ Yes ❑ No

Are dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated recorded in the SWPPP? ❑ Yes ❑ No

Inspection Compliance

Are weekly and/or post rain producing event site inspections being conducted? ❑ Yes ❑ No

Are the inspections documented? ❑ Yes ❑ No

Is the documentation available for review at the time of the inspection? ❑ Yes ❑ No

Are pollution prevention controls, BMPs, and measures (identified in the SWPPP) revised as appropriate, but in no case later than 7 days following the inspection? ❑ Yes ❑ No

Condition of Receiving Waters (Outfall Inspection)

Is a stormwater discharge apparent at the time of the inspection? ❑ Yes ❑ No

Is there evidence that there has been a discharge of polluted runoff (e.g., muddy flows, sediment deposits, etc.) to the receiving water? ❑ Yes ❑ No

Non-Compliance/Comments

Overall Site Issue				
	BMP/activity	**Implemented?**	**Maintenance Required?**	**Corrective Action Needed and Notes**
1	Are all slopes and disturbed areas (not actively being worked) properly stabilized?	❑ Yes ❑ No	❑ Yes ❑ No	
2	Are natural resource areas (e.g., wetlands, mature trees, etc.) protected with barriers or similar BMPs?	❑ Yes ❑ No	❑ Yes ❑ No	
3	Are perimeter controls and sediment barriers adequately installed and maintained?	❑ Yes ❑ No	❑ Yes ❑ No	
4	Are discharge points and receiving waters free of any sediment deposits?	❑ Yes ❑ No	❑ Yes ❑ No	
5	Are storm drain inlets properly protected?	❑ Yes ❑ No	❑ Yes ❑ No	
6	Is the construction exit preventing sediment from being tracked into the street?	❑ Yes ❑ No	❑ Yes ❑ No	
7	Is trash/litter from work areas collected and placed in covered dumpsters?	❑ Yes ❑ No	❑ Yes ❑ No	
8	Are washout facilities available, clearly marked, and maintained?	❑ Yes ❑ No	❑ Yes ❑ No	
9	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	❑ Yes ❑ No	❑ Yes ❑ No	
10	Are materials that are potential stormwater contaminants stored inside or under cover?	❑ Yes ❑ No	❑ Yes ❑ No	
11	Are non-stormwater discharges (e.g., dewatering) properly controlled?	❑ Yes ❑ No	❑ Yes ❑ No	

Print name and title: _____

Signature:_____ Date:_____

APPENDIX D: NASA SWM Inspection Report Form

NASA Langley Research Center
Stormwater Facility Inspection Report

BMP ID:	**DATE:**	**ASSESSED BY:**

SECTION 1- BACKGROUND INFORMATISECTION

BMP TYPE :

☐ Dry Detention Pond	☐ Dry Swale	☐ Wetland
☐ Extended Detention Pond	☐ Wet Swale	☐ Level Spreader
☐ Wet Pond	☐ Grass Channel	☐ WQ Inlet
☐ Filter- specify:	☐ Dry Well	☐ Proprietary Device
☐ Infiltration- specify:	☐ Permeable Pavement	
☐ Check if structure is underground	☐ Bio-retention Cell	☐ Other: _____

YEAR CONSTRUCTED/ NOTES:

OWNERSHIP: NASA

SITE CHARACTERIZATION

DRAINAGE AREA: _____ (acres) **IMPERVIOUS COVER:** _____ (acres) Discerned from: ☐Plan ☐ GIS ☐Field

CONTRIBUTING DRAINAGE AREA (% land use**):**
_____ Industrial _____ Urban
_____ Forested _____ Other
_____ Maintained Grass

WATER QUALITY VOL (FROM DESIGN PLAN): (ft^3)

SECTION 2- FIELD VISIT

Rain in last 48 hrs? ☐ Yes ☐ No

Evidence of high water table (e.g., excessive soil saturation)*?*
☐ Yes ☐No

DESIGN ELEMENTS

FACILITY SIZE:	**OBSERVED WQ STORAGE**	**HYDRAULIC CONFIGURATION :**	**DESIGN STORM(S):**
Length: _____ (ft) Width: _____ (ft) Surface Area: _____ (ft^2) Depth of WQ storage _____ (ft)	**VOL:** _____ (ft^3)	☐ On-line Facility ☐ Off-line Facility	☐ Water Quality ☐ Flood Control ☐ Water Quantity/Channel Protection ☐ Unknown

BMP SIGNAGE:
☐ None ☐ Flood Warning ☐ Stormwater Education ☐ No Trespassing ☐ Wildlife Habitat
☐ Do Not Mow ☐ Other:

OUTLET CHARACTERISTICS

PRIMARY OUTLET STRUCTURE:	☐ N/A – infiltration w/ no outlet ☐ Pipe ☐ Riser ☐ Weir ☐ Large Storm Overflow ☐ Open channel ☐ Large Storm By-pass ☐ Other:
OUTLET FEATURES:	☐ N/A ☐ Trash Rack ☐ Pond Drain ☐ Inverted outlet pipe ☐ Standard outlet ☐ Anti-vortex device ☐ Perforated pipe ☐ Gravel Diaphragm ☐ Micropool outlet ☐ Multiple outlet levels *Outlet includes restrictor?* Yes No
OUTLET STRUCTURE CONDITIONS:	Erosion at Outlet: ☐ None ☐ Slight ☐ Moderate ☐Severe Outlet Clogging: ☐ None ☐ Slight ☐ Moderate ☐ Severe Structural Problems: ☐None ☐ Slight ☐ Moderate ☐ Severe
CONDITIONS AT OUTFALL:	☐ Stream ☐ Closed storm sewer ☐ Surface channel ☐ Road ditch ☐ Other: _____ ☐ Unknown

Active Erosion: ☐ None ☐ Slight ☐ Moderate ☐ Severe Trash: ☐None ☐ Slight ☐ Moderate ☐ Severe Sedimentation: ☐None ☐ Slight ☐ Moderate ☐ Severe	Odor: ☐ None ☐ Slight ☐ Moderate ☐ Severe Algae: ☐ None ☐ Slight ☐ Moderate ☐ Severe Other WQ Problems: ☐ None ☐ Slight ☐ Moderate ☐ Severe

Emergency Spillway Type: ☐ Channel ☐ Riser ☐ Overflow ☐ Weir ☐ Other:

SOIL OR FILTER MEDIA

TYPE OF FILTER/INFILTRATION MEDIA: (check all that apply)
☐ Soil mix _____(in) ☐ Sand _____ (in) ☐ Gravel _____ (in) ☐ Large Stone _____ (in)
☐Organic material _____(in) ☐ Other _____ ☐ N/A ☐ Unknown

Avg. depth of sediment build-up on surface? _____ (in)

SOIL MEDIA SAMPLE:
Dominant Soil Type ☐Clay ☐Loam ☐Sand ☐Sand/Loam
Is the soil homogenous? ☐ Yes ☐ No

Comments:

VEGETATION

GENERAL OBSERVATIONS:
☐ Landscaped
☐ Aquatic Bench
☐ Invasive Species
☐ Plant Diversity

TYPE OF GROUND COVER (% of Surface Area in Plan View up to low Outlet**):**
_____ Trees _____ Grasses/Perennials _____ Ponded water _____Other:
_____ Managed Turf _____ Bare Soil _____ Shrubs _____ N/A
_____ Gravel/stone _____ Mulch _____ Emergent wetland

Depth of mulch, if present: ☐ Hardwood _____ (in) ☐ Pine Straw _____ (in) ☐Other _____ (in)
Rate degree of shading of BMP Surface Area by trees: ☐Well Shaded ☐ Some Shading ☐ No Shading ☐ N/A

INLET CHARACTERISTICS

INLET #1:
Diameter/Width: _____ (in)

TYPE OF INLET: ☐ Open Channel
☐ Closed Pipe ☐ Sheet Flow ☐ Curb Cut
☐ Other:

Elevation difference between bottom of inlet and BMP surface: _____(in)

INLET SUBMERSION:
☐ Complete
☐ Partial
☐ None

INLET CONDITIONS:
Inlet Erosion: None Slight Moderate Severe
Inlet Clogging: None Slight Moderate Severe
Structural Problems: None Slight Moderate Severe

Comments:

INLET #2:
Diameter/Width: _____ (in)

TYPE OF INLET: ☐ Open Channel
☐ Closed Pipe ☐ Sheet Flow ☐ Curb Cut
☐ Other:

Elevation difference between bottom of inlet and BMP surface: _____(in)

INLET SUBMERSION:
☐ Complete
☐ Partial
☐ None

INLET CONDITIONS:
Inlet Erosion: None Slight Moderate Severe
Inlet Clogging: None Slight Moderate Severe
Structural Problems: None Slight Moderate Severe

Comments:

PRETREATMENT

TYPE OF PRETREATMENT *(check all that apply)*
☐ None
☐ Sediment Forebay (ft3)
☐ Grass Channel
☐ Riprap Channel or Apron
☐ Grass Filter Strip
☐ Plunge Pool?
☐ Stone Diaphragm
☐ Other:

PRETREATMENT FUNCTION ☐ By design ☐ Incidental

Is pretreatment functioning? ☐Yes ☐No
Is sediment removal necessary? ☐Yes ☐No
Signs of pretreatment bypass? ☐Yes ☐No
Signs of flow of sediment from pretreatment to BMP? ☐Yes ☐No
Severity: ☐Slight ☐Moderate ☐Severe

GENERAL DESIGN

BMP FEATURES (check all that apply)
☐ Maintenance Access ☐ Underdrain
☐ Fence ☐ Clean Out
☐ Multi-cell ☐ Observation Well
☐ Micropool ☐ Is water present in observation well? Yes/No Depth: _____ft
☐ Impermeable Liner
☐ Pond Drain
☐ Other:

CONVEYANCE THROUGH BMP
☐ No Defined Channel
☐ Low Flow Channel
☐Concrete ☐ Eroded ☐ Earthen ☐ Other _____
Length of Shortest Flow Path: _____(ft)

Is BMP designed with a Permanent Pool? ☐ Yes ☐No

PERFORMANCE		
GENERAL PROBLEMS: (check all that apply)		
☐ Maintenance Needed	☐ Erosion at Embankments	☐ Permanent Pools not stable
☐ Water Bypass of Inlet	☐ Erosion within Facility	☐ Inadequate vegetation
☐ Water Bypass of Outlet	☐ Deposition within Facility	☐ Dead or Diseased Vegetation
☐ Incorrect Flow Paths	☐ Inappropriate Ponding of Water	☐ Too many invasive plants
☐ Short-circuiting of treatment mechanism	☐ Clogged Pond Drain/Underdrain	☐ Trees on Embankment
☐ No or ineffective treatment	☐ Clogged Media	☐ Failing structural components
☐ Ineffective pretreatment	☐ Inappropriate media material	☐ Safety issue (Note:_____)
☐ Others _____ __	☐ Inappropriate underlying soil (infiltration)	
WATER QUALITY IN FACILITY:	**EVIDENCE OF:**	
Algae ☐ None ☐ Slight ☐ Moderate ☐ Severe		
Odor ☐None ☐Slight ☐ Moderate ☐ Severe	☐ Geese	
Turbidity ☐ None ☐ Slight ☐ Moderate ☐ Severe	☐ Animal Burrows	
Color ☐ Normal ☐Abnormal	☐ Mosquitoes	
	☐ BMP Alteration	

PROBLEM	**1=NONE**	**2 - FEW**	**3 – SEVERAL**	**4-SEVERE**
TRASH	No evidence of trash	A few pieces of trash throughout BMP	Trash accumulation near inlet/outlet	Lots of trash in BMP or BMP used for storage
BMP BANK EROSION	No noticeable erosion	Slight erosion < 5% of bank affected	Moderate erosion ~15% of bank affected	Banks severely eroded, >25% of bank affected
SEDIMENT DEPOSITION	No sediment deposition	Areas of minor sediment deposition	Areas of some deposition, may be severe near inlet/outlets	Lots of deposition resulting in pond bottom clogging
SURFACE SLOPE	0-1% BMP surface slope	1-3% BMP surface slope or steeper slopes with check dams,	3-5% BMP surface slope with no check dams,	>5% surface slope;
SIDE SLOPES	BMP side slopes 3:1 or flatter	BMP side slopes 2:1	Steep BMP side slopes	Risk of side slope failure
STRUCTURAL	No evidence of structural damage	Minor problems (e.g., bank slump, eroded channels)	Moderate structural problems –failure pending	Structural failures (e.g., bank failure, blowout)
VISIBILITY	High visibility, near high-traffic areas	Some visibility, near traffic areas	Limited visibility, near low traffic areas	No visibility, behind buildings or fences
ACCESSIBILITY	Maintained access area for vehicles	Access area designated, but not maintained	Access for vehicles not designated	Access for vehicles not possible
VEG COVER	No mowing in/around BMP	Mowing along BMP edges but areas of no mow in BMP bottom	Mowed turf vegetation	BMP bottom has large areas of bare soil
	Dense plant cover (>75%)	Plant cover, 50-75%	Some plant cover, 25-50%	Sparse Plant Cover
TREES	Healthy and established	Slightly Stressed	Stressed	Dead
GROUND COVER	Healthy and established	Slightly Stressed	Stressed	Dead
SHRUBS	Healthy and established	Slightly Stressed	Stressed	Dead
EMERGENT WETLAND	Healthy and established	Slightly Stressed	Stressed	Dead

OVERALL PERFORMANCE SCORE (circle one number)									
Excellent design and function, no general problems with performance			BMP is well designed, but is undersized or has a few performance problems		BMP is adequately designed, several problems with performance are noted			Poor BMP design, severe performance problems or failure	
10	9	8	7	6	5	4	3	2	1

FIELD NOTES
GOOD OR INTERESTING DESIGN FEATURES:
POOR OR PROBLEMATIC DESIGN FEATURES:

APPENDIX E: Corrective Action Notice

NASA Langley Corrective Action Notice

Project Name: Permit Number:

Inspector: Date: Time:

Stage of Construction

Pre-Construction □	Building Construction □	Construction of SWM Facilities □
Clearing/Grubbing □	Finish Grading □	Maintenance of SWM Facilities □
Rough Grading □	Final Stabilization □	Other_____ □

Item#	Law or Regulation	Description/Location of Deficiency, Recommended Actions, Comments

The corrective action deadline date must be adhered to. If the site stays in non-compliance and/or corrective actions are not completed by the deadline, other enforcement actions will be pursued. If rain is expected and a potential discharge may occur, corrective action needs to be taken immediately. Please notify SPEEB via email (photos, etc.) at peter.vandyke@nasa.gov once corrective actions have been taken.

Deadline Date:	NASA Re-Inspection Date:
Inspector Signature:	Date:

APPENDIX F: Historical and Current LDAs Tracking Sheet

Project Description	Permit Operator	Coverage Date	Tracking Number	Status
1189/1190/1200	MK Taylor	4/28/2009	DCR-01-09-101658	Closed
Road Repave	Asphalt Roads & Materials Co.	6/12/2009	DCR01-09-101919 to VAR10-10-102326	Closed
2101	Whiting Turner	8/5/2009	VAR10-10-103092	Closed
1262 Pad	Riesbeck Contracting	8/15/2009	VAR10-10-103279	Closed
B1236 Parking Lot	Hudgins	9/17/2009	VAR10-10-103433	Closed
Big DEMO Project	Bhate Environmental	10/14/2009	VAR10-10-103599	Closed
B1250 Parking Lot	MK Taylor	12/9/2009	VAR10-140-103943	Closed
Tunnel Demo	Charter Environmental	5/5/2010	VAR10-10-104736	Closed
Hydro Impact	J.B. Denny	6/3/2010	VAR10-10-104921	Closed
Repaving	ARM	5/24/2010	VAR10-10-104890	Closed
009 OWS Work	Northwind	1/6/2011	VAR10-11-100937	Closed
003 OWS Work	Northwind	1/6/2011	VAR10-11-100937	Closed
1212C - Road	Pembroke	6/10/2011	VAR10-11-101745	Closed
Temp Gravel Lot	MK Taylor	6/28/2011	VAR10-11-101822	Closed
Phase II Demo	All Phases	10/7/2011	VAR10-12-100545	Closed
1229 Parking Lot	Northwind	6/21/2011	VAR10-12-100034	Closed
1212 C	Riesbeck Contracting	Summer	VAR10-12-103769	Closed
IESB Site	Whiting Turner	6/4/2012	VAR10-12-103624	Active Site (Reapplied)
TRIAD DEMO	Triad	6/18/2012	VAR10-12-103734	Closed
Stratton Road	ROME	8/1/2012	VAR10-13-100158	Closed
1195 Steam Line	MK Taylor	5/29/2013	VAR10-13-101677	Closed
Fire Station Upgrade	Heard	8/1/2013	VAR10-14-100253	Permit Expiring June 30 (Under 1 acre)
1229/LTPT	All Phase	12/9/2013	VAR10C696	Active Site (Reapplied)
1212 Steam Line	MK Taylor	11/8/2013	VAR10C315	Closed
Sanitary Upgrades	Aspen	1/15/2014	VAR10C750	Permit Expiring June 30 (Under 1 acre)
Potable Water Upgrades	BCI Construction	2/14/2014	VAR10D018	Permit Expiring June 30 (Under 1 acre)

APPENDIX G: Proposed LDAs Tracking

Project Description	Permit Operator	Estimated Coverage Date	Disturbed Area (acres)	Status / Notes
Computational Research Facility Construction	Not selected	Fall 2014	~3.5 acres	Project is out for bids. Will comply with Technical Criteria Part IIB
Material Science Laboratory (MSL) Construction	Not selected	Fall/Winter 2014	~3.3 acres	Currently in Design Phase. Will comply with Technical Criteria Part IIB
Electrical Distribution System Upgrades	Not selected	Winter 2014 or later	2.0 acres	90% Design Completed
ALDF Demolition	Not selected	Winter 2014	1.0 acres	Currently in Design Phase

** Many of these projects are contingent upon budget. These projects may or may not occur.