

**GLENN RESEARCH CENTER, ENVIRONMENTAL PROGRAMS MANUAL****TABLE OF CONTENTS**

NOTE: The revisions to these Chapters will be maintained and approved by the Energy and Environmental Management Office (FE). The published dates and the expiration dates are listed in the columns next to each chapter. If you are referencing paper copies, please verify that it is the most current version before use. Users of this manual should be cognizant of other documents such as the [GLPD 8500.1A, Glenn Environmental Management System Policy](#).

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Change Record

Revision	Effective Date	Expiration Date	C-25, Change Request #	Description
Basic	April 26, 2012	April 26, 2017	1	Initial Release
Change 1	August 21, 2012	same	NA	Administrative changes throughout manual: Removed SHED and replaced with Energy and Environmental Management Office (EEMO) (in all of the chapters).
Change 2	January 24, 2013	same	NA	Removed the following sentences from Chapter 10: Sec. 5.2: The Chief prepares the Solid Waste Management Plan and the Waste Contractor Annual Certificate of Compliance. Sec.7.0: Waste Contractor Annual Certificate of Compliance.— Maintained by Chief of LTID. Sec. 7.0: Solid Waste Management Plan.—Maintained by Chief of LTID.

***Include all information for each revision. Do not remove old revision data. Add new rows to table when space runs out by pressing the tab key in the last row, far right column.*

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Chapter 2—National Environmental Policy Act (NEPA) Program

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes procedures and practices for the National Environmental Policy Act (NEPA) Program at the NASA Glenn Research Center (GRC) Lewis Field and Plum Brook Station. Adherence to the procedures and practices established in this chapter will

- Ensure the minimum requirements of GRC's NEPA review of proposed programs, projects, actions, and activities are met and comply with applicable Federal, state, and local regulations, Presidential Executive Orders, and NASA and GRC NEPA and environmental policies and requirements
- Assist in new project, program, actions, and activities planning to determine NEPA documentation requirements, environmental impacts, and alternatives of proposed projects, programs, actions, and activities

2.0 APPLICABILITY

This chapter is applicable to all proposed programs, projects, actions, or activities at GRC sites and to any NASA-controlled, Government-owned facilities associated with GRC. It is applicable to GRC employees, contractors, and guest personnel at all levels who in any way participate in the initiation, development, and implementation of GRC programs, projects, actions, or activities.

3.0 BACKGROUND

NEPA is a Federal legislation that establishes the national policy for protecting the human environment. The act requires Federal agencies to consider the environmental effects of their actions before beginning a project and to examine alternative actions that would reduce any threat or harm posed to the environment. Environmental, technical, and socioeconomic factors are to be considered. NEPA is also an environmental disclosure statute and provides procedural requirements to ensure available information be adequately addressed and made available to NASA decision makers in a timely manner so they can consider the environmental consequences of the proposed action or activity. Through NEPA, environmental information shall also be made available to the public as well as other Federal, state, and local agencies. It is important to note that NEPA does not require that the proposed action or activity be free of environmental impacts, but requires the decision maker to consider environmental impacts as one factor in the decision to implement a program, project, action, or activity.

4.0 POLICY

It is GRC policy to follow the requirements and recommendations of NASA Procedural Requirement (NPR) 8580.1, Implementing the National Environmental Policy Act (42 United States Code (U.S.C.) 4321–4345), and Executive Order 12114, which describes how NASA implements NEPA. Additionally, GRC follows the requirements and recommendations of the Council on Environmental Quality Regulations (40 Code of Federal Regulations (CFR) Part 1500) and NASA NEPA Regulations (14 CFR Part 1216).

5.0 RESPONSIBILITIES

5.1 All Directorate Heads

Directorate heads identify projects, programs, actions, and activities that may affect the human environment and coordinate with the NEPA Program Lead early in the project, program, action, or activity development. All Directorate heads are responsible for complying with the policies and procedures contained in GRC's Integrated Contingency Plans (ICPs).

5.2 Center Director

The Center Director approves and signs all Finding of No Significant Impact (FONSI) documents, environmental assessments (EAs), records of decisions (RODs), environmental impact statements (EISs), and letters to elected officials.

5.3 Public Affairs Specialist in the Community and Media Relations Office

The public affairs specialist serves as the liaison between the NEPA Program Lead and media outlets to ensure that environmentally significant activities are disclosed to the public and that public opinion is taken into consideration during the NEPA process.

5.4 NEPA Program Lead

The NEPA Program Lead has the responsibility to implement NEPA at GRC and maintains the records that serve as evidence of the Center's compliance with NEPA. The NEPA Program Lead also serves as the liaison between the Center, NASA Headquarters, and external agencies in all matters related to NEPA. At Plum Brook Station, the Environmental Program Manager has the responsibility to implement NEPA and maintain records of Plum Brook Station compliance. The Program Lead utilizes the [NASA Electronic Tracking System](#) (NETS) to record major NEPA analyses.

5.5 Safety, Health and Environmental Board

The Safety, Health and Environmental Board (SHEB) reviews all NEPA documentation, including EAs, FONSI, EISs, and RODs prior to submittal for signature.

5.6 Facilities Division Project Managers

Facilities Division (FD) Project Managers shall

- Have the responsibility to implement NEPA within the FD
- Submit NEPA documents through the Facilities Preservation Officer to the NEPA Program Lead within EEMO
- Coordinate with the EMMO NEPA program manager on current and future projects, programs, actions, or activity schedules
- Prepare the NEPA Checklist, NASA Form [C-150](#), for all projects, programs, actions, or activities regardless of anticipated environmental impacts and submit it to the FD coordinator (see Appendix [B](#) for NEPA process flowchart)

5.7 Research and Technology Directorate

The Research and Technology Directorate shall

- Prepare the Statement of Work (SOW) to accompany the NASA [C-8095](#), SOW Concurrence form, for all projects, programs, actions, or activities regardless of anticipated environmental impacts. Completion of additional NEPA documentation and associated technical studies may be required.
 - The SOW shall follow the guidelines of the Business Management System (BMS) Work Instruction, [GLWI-Q-5600.1D](#), found in the BMS library.
- Provide funding for additional NEPA documentation as required.
- Coordinate with NEPA Program Lead in the earliest stages of program or project development.
- Notify the NEPA Program Lead if equipment associated with programs, projects, actions, or activities will be used offsite in the natural environmental or unusual impacts are anticipated.
- Review the record of environmental consideration (REC) for the project and/or program after the REC has been completed by NEPA Program Lead and submitted back to the initiating office.

5.8 Office of the Chief Counsel (Designated Representative)

A designated representative from the Office of the Chief Counsel reviews EAs, FONSI, EISs, and RODs prior to submittal to NASA Headquarters Code OJE for review and approval.

6.0 REQUIREMENTS

6.1 Federal Agency Requirement to Comply with NEPA (42 U.S.C. 4321-4345)

This code establishes the general policies and procedures for Federal agencies to follow to comply with NEPA. Each agency of the Federal government is required to comply with the [Council on Environmental Quality \(CEQ\) Regulations](#) (40 CFR Part 1500) for implementing the procedural provisions of the act, and in consultation with CEQ, to develop their agency-specific procedures to ensure that environmental information is available to the public and the agency decision makers before decisions are made and actions taken.

NASA NEPA Regulations (14 CFR Part 1216) establish NASA policy on environmental quality and control and the responsibilities of NASA officials in carrying out these policies. This policy is further expanded upon in NASA's NEPA Procedures (NPR 8580.1), which provide guidance and step-by-step procedures for successfully implementing NEPA at NASA facilities.

6.2 Facilities Division's Procedural Requirements (GLP-FD0-1000.6)

The FD's organizational procedure, [GLP-FD0-1000.6](#), Project Management Process, outlines NEPA procedures applicable to the FD.

6.3 NEPA Process Flowchart

A generalized process flowchart is used by the NEPA Program Lead and project initiators to determine the effort level and documentation to be required for a particular project upon submittal of an Environmental Checklist (NASA [C-150](#)) or scope of work. See Appendix [B](#).

7.0 RECORDS

- NEPA Checklist, NASA Form [C-150](#).—Maintained by NEPA Program Lead.
- SOW Requirements Review & Concurrence, NASA Form [C-8095](#).—Maintained by NEPA Program Lead.
- Safety permits reviewed for NEPA concerns.—Maintained by NEPA Program Lead.
- Congressional Notification of Grants Forms.—Maintained by NEPA Program Lead.
- RECs.—Maintained by NEPA Program Lead.
- FONSI.—Maintained by NEPA Program Lead.
- EAs.—Maintained by NEPA Program Lead.
- EISs.—Maintained by NEPA Program Lead.
- Notice of Availability.—Maintained by NEPA Program Lead.
- Notice of Intent.—Maintained by NEPA Program Lead.
- RODs.—Maintained by NEPA Program Lead.
- EA or EIS Administrative Record Packet.—Maintained by NEPA Program Lead.
- NASA NETS

8.0 REFERENCES

Document number	Document title
14 CFR Part 1216	NASA NEPA Regulations
40 CFR Part 1500	Council on Environmental Quality Regulations

42 U.S.C. 4321–4345	The National Environmental Policy Act of 1969, as amended
Executive Order 12114	Environmental Effects Abroad of Major Federal Actions
GLWI-Q-5600.1D	Statement of Work Concurrence, Revision D
GLP-FD0-1000.6	Facilities Division’s Project Management Process
NPR 8580.1	Implementing the National Environmental Policy Act and Executive Order 12114

APPENDIX A.—DEFINITIONS AND ACRONYMS

Business Management System (BMS).—Online home to Glenn Research Center Work Instructions, the Corrective and Preventive Action Reporting and Auditing System, training contacts, and documentation storage for internal and external audits.

Categorical Exclusion (CatEx).—An exclusion that is granted for a category of actions that does not individually or cumulatively have a significant effect on the human environment, and that the given Federal agency has specifically identified in its regulations, and for which, therefore, neither an Environmental Assessment (EA) nor an Environmental Impact Statement (EIS) is required, except under extraordinary circumstances.

Specific NASA actions that normally can be covered by a CatEx include (as listed in 14 CFR 1216.305(d))

- a. Research and development activities in
 1. Space science, other than specific spacecraft development and flight projects
 2. Space and terrestrial applications, other than specific spacecraft development and flight projects
 3. Aeronautics and space technology and energy technology applications, other than experimental projects that have the potential for substantial environmental impacts
 4. Space transportation systems engineering and scientific and technical support operations, routine transportation operations, and advanced studies
- b. Enhanced space tracking and data systems
- c. Facility planning and design (funding)
- d. Minor construction of new facilities, including rehabilitation, modification, and repair
- e. Continuing operations of a NASA facility at a level of effort, or altered operations, provided the alterations induce only social and/or economic effects but no or minimal natural or physical environmental effects

Even though an action may be categorically excluded from the need for a formal EA or EIS, it is not excluded from the requirement for an environmental analysis conducted during the earliest planning phases.

Code of Federal Regulations (CFR)

Construction of Facilities (CoF).—A NASA corporate program that funds planning for future facility needs, design of facilities projects, revitalization projects (repair, rehabilitation, and modification of existing facilities), construction of new facilities, and acquisition of collateral equipment.

Cooperating agency.—A Federal agency, other than the lead agency, that has legal jurisdiction or special expertise to comment on the proposed actions of a lead agency. A state or local agency of similar qualifications or, when the effects are on a reservation, an Indian tribe, may by agreement with the lead agency, become a cooperating agency.

Council of Environmental Quality (CEQ).—Placed in the Executive Office of the President to ensure that Federal agencies meet their obligations under the National Environmental Policy Act (NEPA). CEQ oversees implementation of NEPA, principally through issuance and interpretation of NEPA regulations that implement the procedural requirements of NEPA. CEQ also reviews and approves Federal agency NEPA procedures, approves of alternative arrangements for compliance with NEPA in the case of emergencies, and helps to resolve disputes between Federal agencies and with other governmental entities and members of the public.

Cumulative effects.—Effects resulting from incremental consequences of an action, when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (Federal or non-Federal), or public or private organization, or person that undertakes such actions.

Effects.—Direct effects, which are caused by the action or activity and occur at the same time and place. Indirect effects, which are caused by the action or activity and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Effects and impacts as used in NEPA are synonymous. Effects include ecological (e.g., the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.

Environmental analysis.—The analysis of the environmental effects of proposed actions. The analysis is carried out from the very earliest planning studies for the project, program, action, or activity and form, if necessary, the basis from which the more formal environmental assessments and/or environmental impact statements are developed. The analysis is recorded on a NEPA Checklist (NASA Form **C-150**) and record of environmental consideration or supporting documents, as necessary.

Environmental assessment (EA).—A concise public document, which a Federal agency is responsible for preparing or overseeing the preparation of, that

- a. Briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement (EIS) or a finding of no significant impact (FONSI)
- b. Is proof of an agency's compliance with NEPA when an EIS is not necessary
- c. Facilitates preparation of an EIS when one is necessary

The EA shall briefly describe the need for the proposed action and alternatives and the environmental impacts of the proposed action and alternatives, and it shall list the agencies and persons consulted. It forms the basis of the decision to prepare a FONSI or a notice of intent (NOI) to prepare an EIS. Specific NASA actions that normally require an EA include, but are not limited to

- a. Specific spacecraft development and flight projects in space science
- b. Specific spacecraft development and flight projects in space and terrestrial applications
- c. Specific experimental projects in aeronautics and space technology and energy technology applications, which may have a substantial effect on the human environment
- d. Development and operation of new space transportation systems and advanced development of new space transportation and spacecraft systems
- e. Reimbursable launches of non-NASA spacecraft or payloads
- f. Major Construction of Facilities (CoF) projects
- g. Actions to alter ongoing operations at NASA installations that could lead, either directly or indirectly, to natural or physical environmental consequences

Environmental impact statement (EIS).—A document that is prepared for an action that may have significant impact(s) on the quality of the human environment or that has the potential for controversy in environmental effects. It is a report that provides a full and fair discussion and informs decision makers and the public of the reasonable alternatives that would avoid or minimize adverse consequences or enhance the quality of the human environment. An EIS ensures that the policies and goals of NEPA are integrated into NASA projects, programs, actions, and activities. An EIS is filed with the Environmental Protection Agency, published, and distributed widely for public comment.

Specific NASA actions that normally require an EIS include but are not limited to

- a. Development and operation of new launch vehicles
- b. Development and operation of space vehicles likely to release substantial amounts of foreign materials into Earth's atmosphere or space
- c. Development and operation of nuclear systems, including nuclear reactors and thermal devices used for propulsion and power generation, or both

Environmental mitigation and monitoring report.—A document prepared at the end of a project by the project manager that summarizes environmental impact mitigation efforts during the project and deviations from mitigation plans.

Environmental resources document (ERD).—A Center-wide report that characterizes all aspects of the installation's environment at the time of report preparation and describes the environmental consequences of the installation's existing operations. The ERD is used to assess the significance of subsequent proposed actions on the environment and is required by NASA regulation as a reference source for the preparation of environmental assessments and environmental impact statements.

Facilities Division (FD).—Consisting of the Planning Team, Program Management Office, Engineering Management Branch, Systems Management Branch, Operations Management Branch, and Project Management Branch.

Finding of No Significant Impact (FONSI).—A public document prepared by the Safety, Health and Environmental Division that briefly reflects the Agency's final decision and reasons an action will not have a significant effect on the human environment and for which an environmental impact statement will not be prepared. It is published in the Federal Register by NASA Headquarters.

Glenn Research Center (GRC).—Consists of Lewis Field in Cleveland, Ohio, and Plum Brook Station in Sandusky, Ohio.

Human environment.—Human environment shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. This means that economic or social effects are not intended by themselves to require preparation of an environmental assessment (EA) or environmental impact statement (EIS). When an EA or EIS is prepared and economic or social and natural or physical environmental effects are interrelated, then the EA or EIS will discuss all of these effects on the human environment.

Integrated Contingency Plan (ICP)

Lead agency.—The agency or agencies preparing or having taken primary responsibility for preparing the environmental analysis or environmental impact statement.

Major facility project.—Based on an October 2, 2002, memo written by NASA Headquarters Environmental Management Division, "major" construction projects as defined by NASA NEPA regulations are not necessarily equated with monetary limits but with the scope of the project and the context and intensity of environmental impacts. (Construction of Facilities defines a major project as construction in excess of \$750,000; repair, rehabilitation, and modification in excess of \$1,000,000, and land acquisition and emergency repair approved under the provisions of Section 308(b) of the National Aeronautics and Space Act of 1958 (as amended) at any cost.) Requires a detailed environmental analysis and may require further NEPA documentation.

Major Federal action.—Major Federal action includes actions with effects that may be major and which are potentially subject to Federal control and responsibility. Major reinforces but does not have a meaning independent of significant.

Minor Facility project.—Based on an October 2, 2002, memo written by NASA Headquarters Environmental Management Division, minor construction projects as defined by NASA NEPA regulations are not necessarily equated with monetary limits but with the scope of the project and the context and intensity of environmental impacts. (Construction of Facilities defines a minor project as construction in excess of \$200,000 and not exceeding \$750,000; repair and rehabilitation in excess of \$200,000 and not exceeding \$1,000,000.) Requires a detailed environmental analysis.

NASA Electronic Tracking System (NETS)

NASA Headquarters.—Based in Washington, DC, the central location for submittals of EAs, EISs, FONSI, and RODs submitted through the Office of Chief Counsel for further review and recordkeeping as required per the CEQ.

NASA Procedural Requirements (NPR).—Provide Agency requirements to implement NASA policy as delineated in an associated NASA Policy Directive.

National Environmental Policy Act (NEPA).—Requires Federal agencies to consider environmental effects that include, among others, impacts on social, cultural, and economic resources, as well as natural resources.

Notice of availability (NOA).—A draft or final environmental impact statement for public review.

Notice of intent (NOI).—A public notice that a draft or final environmental impact statement (EIS) will be prepared. It summarizes issues discussed in the Environmental Assessment, if one was done. The notice shall briefly (1) describe the proposed action and alternatives; (2) describe the Agency’s proposed scoping process including whether, when, and where any scoping meeting will be held; and (3) state the name and address of a person within the lead Agency who can answer questions about the proposed action and the EIS. This notice is required by law to allow interested parties to participate in the EIS development or to review it upon completion.

Record of decision (ROD).—A public document that reflects the agency’s final decision, rationale behind that decision, and commitments to monitoring and mitigation for a particular program, project, action, or activity. The ROD is signed by the GRC Center Director and Headquarters Code OJE, and kept in the GRC NEPA Document Manager’s official files. It is not published in the Federal Register, but is made available upon request.

Record of environmental consideration (REC).—A document prepared by the EMMO that outlines the level of documentation a project needs to satisfy NEPA requirements.

Safety, Health and Environmental Board (SHEB).—The GRC safety, health and environmental policy and decision-making policy board. The board directs the Center’s safety, health, and environmental program, providing top management leadership and oversight for the Center’s ISO 14001 registered Environmental Management System and the Voluntary Protection Program certified Safety and Health Management System.

Safety, Health and Environmental Division (EMMO).—Division under Code Q housing the following five teams providing oversight for all regulatory and operational policies: Facilities, Operations, Construction, Compliance, and Plum Brook Station.

Significant.—As used in NEPA requires considerations of both context and intensity:

- Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human and national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Short- and long-term, direct, indirect, and cumulative effects are relevant.
- Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action.

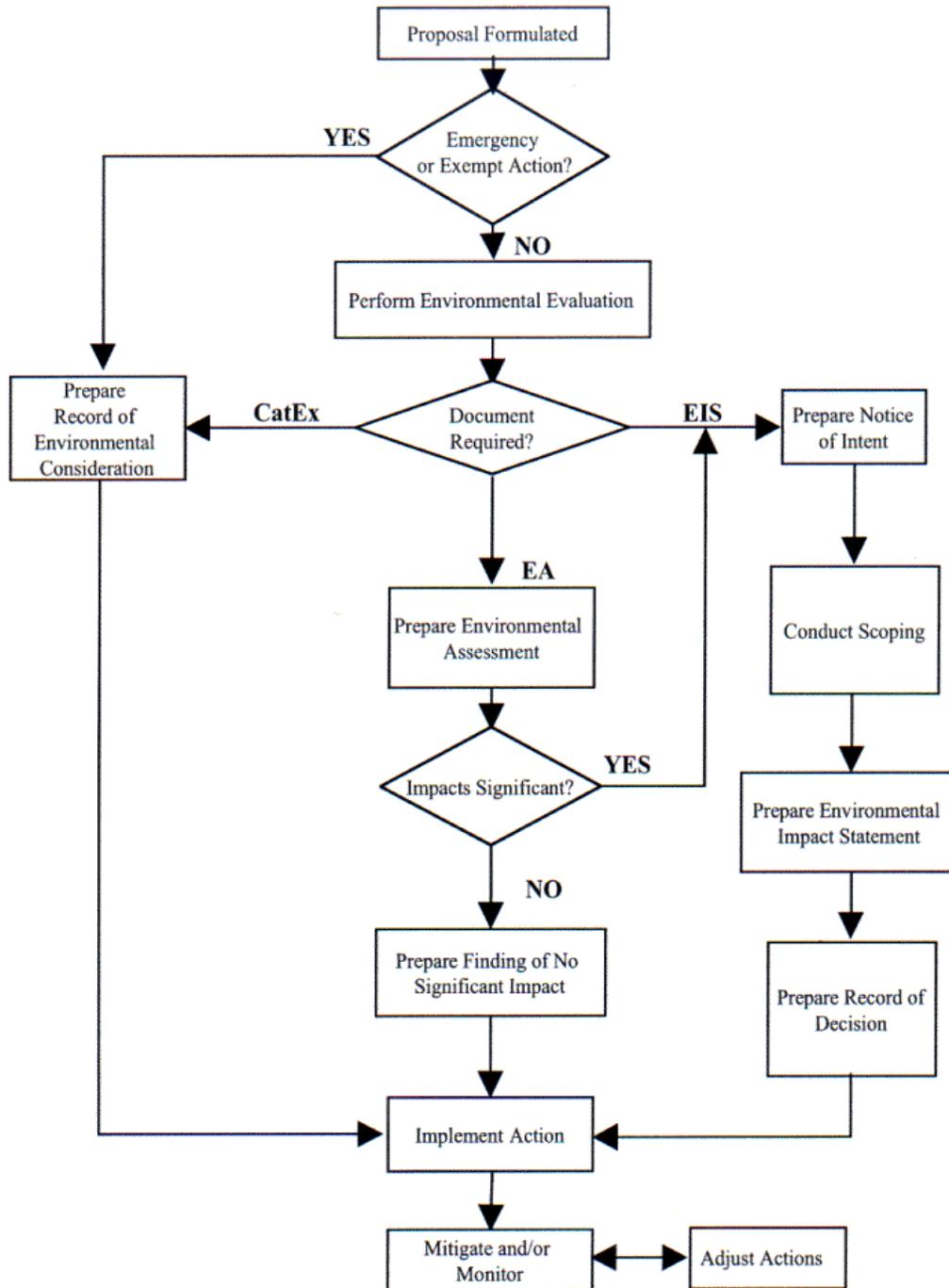
Safety and Mission Assurance Directorate (SMAD).—Ensures a safe, healthful, and protective environment for the NASA Glenn Research Center’s community and enables the mission success of our programs and projects.

Statement of Work (SOW).—Fulfills the requirements of Glenn Work Instruction, GLWI-Q-5600.1, for project initiators to utilize in ensuring appropriate Safety and Mission Assurance Directorate (SMAD) requirements are appropriately addressed. The SOW is submitted with the NASA [C-8095](#) form for routing through SMAD for review and concurrence.

United States Code (U.S.C.)

APPENDIX B.—NEPA PROCESS FLOWCHART

A generalized version of the NEPA Documentation Process at GRC is shown in the following flowchart:



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Chapter 3—Water Pollution Control

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was April 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter provides the policies and requirements for design, construction, modification, and operation of Glenn Research Center (GRC) facilities contributing waterborne wastes to the sanitary, storm, and industrial waste systems. The provisions herein are in accordance with the national efforts to improve water quality through prevention, control, and abatement of water pollution from Federal activities in the United States.

2.0 APPLICABILITY

This chapter is applicable to all personnel at Lewis Field and Plum Brook Station including, but not limited to, civil servants, contractor personnel, and students.

3.0 BACKGROUND

Section 402 of the Clean Water Act (CWA) established an effluent permit system known as the National Pollutant Discharge Elimination System (NPDES). The NPDES constitutes the Nation's central mechanism for controlling pollution of waterways and lakes. Under the CWA, it is illegal for any person, including Federal agencies, to discharge pollutants from a point source without a permit.

4.0 POLICY

It is Glenn policy that the design, maintenance, operation, and changes to the Lewis Field and Plum Brook sewer systems be planned, controlled, and monitored in a manner that assures that environmental pollution regulations will not be violated.

4.1 National Pollution Discharge Elimination System

Lewis Field and Plum Brook Station operate under separate NPDES water discharge permits issued by the Ohio Environmental Protection Agency (EPA). The permits specify the discharges that are allowed, pollutant limitations, and the monitoring and reporting requirements. The Energy and Environmental Management Office (EEMO) performs reporting and monitoring. Any discharge not allowed under these permits is a violation of the CWA.

4.2 Storm Water Permit/Storm Water Pollution Prevention Program

The Lewis Field facility has received a permit to discharge storm water runoff. Please reference the Environmental Programs Manual, Chapter 27, Storm Water Control, for further information at Lewis Field and Plum Brook Station; storm water construction permits are required for any construction project that disturbs over 1 acre of land.

Because it is located outside the boundaries of the Sandusky, Ohio, urbanized area, Plum Brook Station is not subject to NPDES requirements for Municipal Separate Storm Sewer System (MS4). In addition, as a research facility, Plum Brook Station is not required to obtain NPDES coverage under 40 Code of Federal Regulations (CFR) 112.26 for storm water discharges associated with industrial activities.

5.0 RESPONSIBILITIES

5.1 All Employees

Each employee is responsible for assuring no release of toxic or hazardous materials or reportable quantities of other materials to the sanitary, storm, and industrial waste sewer systems.

Any person who becomes aware of any spill, or the inadvertent or unauthorized release of toxic or hazardous materials to any GRC sewer system, shall report the incident by dialing 911 from a Center telephone or 216-433-8888 from a cell phone.

All facilities shall comply with the local, state, and Federal regulations and codes applicable to the collection, transmission, and disposal of waterborne wastes to sanitary, storm, and industrial waste sewer systems.

5.2 Energy and Environmental Management Office

EEMO sets Glenn environmental pollution standards based on the requirements of local, state, and Federal regulations and permits. EEMO updates these standards as required by changes in such regulations and permits. Questions concerning application of standards should be directed to EEMO.

EEMO defines a sampling and testing program to monitor wastes in the sewer systems, the purpose of which is to detect, control, and eliminate pollution.

EEMO is the focal point for the submission for applications of all water permits. EEMO maintains the Lewis Field and Plum Brook Station NPDES permits and monitors according to the specifications included in the permits.

EEMO coordinates with outside agencies as appropriate.

EEMO provides requesters with waste disposal technology information, analytical chemistry, and monitoring metrology for handling and disposing of wastewater.

5.3 Facilities Division

Facility Division (FD) is responsible for the physical operation and maintenance of the process water systems and the industrial waste system.

FD must ensure that contractors plan and implement Best Management Practice (BMP) at construction sites. Refer to EPM Chapter 27, Storm Water Control for BMP.

FD provides engineering systems management.

5.4 Emergency Dispatch

Emergency Dispatch is the focal point of communications in initiating the emergency spill containment and cleanup plans.

6.0 REQUIREMENTS

6.1 Design and Construction

All facilities shall be designed and constructed in accordance with the criteria and standards set forth in the authorities cited above. All facilities shall comply with local, state, and Federal regulations and codes applicable to the collection, transmission, and disposal of waterborne wastes contributing to the sanitary, storm, and industrial waste systems. When the possibility of an accidental release of contaminated waste exists, adequate safeguards shall be included in such designs. Due consideration shall be given to effluent limits established for release to adjacent creeks or rivers and to regional sewage systems. Control or treatment facilities may be required in order to prevent such accidental or normal releases.

The environmental impact and assessment of design, construction, and modification activities shall be evaluated in the initial planning stages. Requirements governing the preparation and review of assessments of the environmental impact of GRC activities are contained in Chapter 2, National Environmental Policy Act, of this manual.

Violations of requirements in this document design should be reported to the Chief of FD for evaluation and corrective action.

BMP must be planned and implemented at construction sites to eliminate sediment discharge to storm sewers.

Accumulation of rainwater in the excavation site should be avoided. In the event rainwater is accumulated in the excavation site, the proper dewatering is needed.

For excavation site where the soil is clean, accumulated rainwater with sediment control shall be discharged to the storm sewer. At excavation sites where the soil is designed as a solid or hazardous waste, accumulated rainwater shall be contained and tested based on the contaminants of soil. The rainwater will be handled accordingly upon analytical results as recommended by EEMO.

6.2 Operation and Maintenance

FD will operate and maintain sewer system to achieve compliance with the standards described in Section 6.1.

The Lewis Field and Plum Brook Station sewer systems will be operated and maintained to satisfy the following intended purposes:

Storm sewer system.—Surface and subsurface rainwater runoff (e.g., from roadways, parking lots, roof drains, and yard basins).

Industrial waste sewer (IWS) system (Lewis Field only).—Wastewaters containing oil and grease. Lewis Field attempts to minimize the discharge of pollutants at each entrance to the IWS. Many of the buildings that generate wastewater containing petroleum products have oil separators that remove floating and settleable materials before entering the IWS system. Contamination of this system with solvents and other chemicals violates the proper and intended use of the IWS. IWS wastewater discharges to a sanitary sewer system.

Sanitary sewer systems.—Domestic-type sewage and gray water originating at standard plumbing fixtures and laboratory sinks.

Radioactive wastes.—All contaminated wastewater that contain radioactive materials shall be disposed of in accordance with applicable Ohio EPA and U.S. Nuclear Regulatory Commission (NRC) regulations and licenses and requirements of the Midwest low-level Radioactive Waste Disposal Compact. In Cleveland, the Health Physics Team will control the disposal of radioactive wastes. At Plum Brook, radioactive waste disposal will be controlled in accordance with established Plum Brook Reactor storage license requirements and procedures approved by the GRC Radiation Safety Officer.

Utility manhole.—Rainwater and/or groundwater accumulated in a utility manhole that is free from oil sheen, odor, color, debris, and sediment can be discharged to a storm sewer. An evaluation of water shall be made prior to discharge. A competent person who is responsible for the project should do an evaluation. Contact EEMO if assistance is needed on the evaluation and/or oil sheen, odor, color, debris, and sediment are detected in the water.

During the discharge if any oil sheen, odor, color, debris, and sediment are detected, cease the discharge and contact EEMO immediately.

Cooling tower.—It is the policy of EEMO that cooling tower maintenance shall be performed in a manner that complies with all relevant laws and regulations. In order to implement this policy, EEMO recommends that prior to cooling tower maintenance activities, EEMO be notified in advance to establish proper procedures.

7.0 RECORDS

- NPDES permit.—Maintained by EEMO.
- NPDES permit monthly reports.—Maintained by EEMO.

8.0 REFERENCES

Document Number	Document Name
40 CFR Part 110–122	Clean Water Act
Part 400–500	
40 CFR Part 122	The National Pollution Discharge Elimination System

40 CFR Part 112	Oil Pollution Prevention (Spill Prevention Control and Countermeasure Plan)
3IO00001*HD	NASA GRC Lewis Field NPDES Permit
40 CFR Part 122.26	The Storm Water Rule
Title I	Code of Regulations/Sewer Use Code
2IO00002*JD	NASA Plum Brook Station NPDES Permit

APPENDIX A.—DEFINITIONS AND ACRONYMS

Clean Water Act (CWA)

Code of Federal Regulations (CFR)

Energy and Environmental Management Office (EEMO)

Environmental Protection Agency (EPA)

Erie County Environmental Services (ECES)

Facilities Division (FD)

Glenn Research Center (GRC)

Industrial waste sewer (IWS)

Municipal Separate Storm Sewer System (MS4)

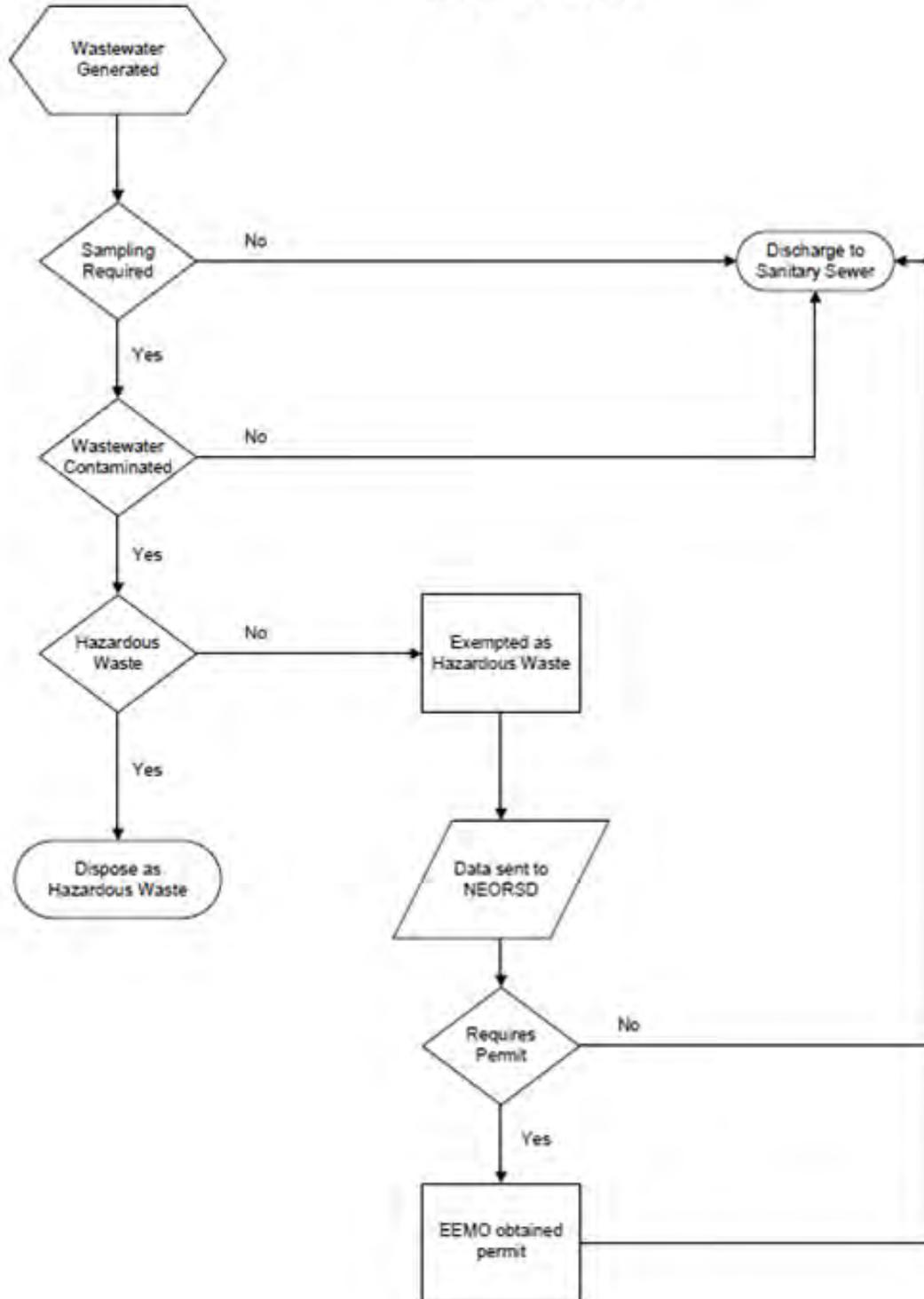
National Pollutant Discharge Elimination System (NPDES)

Northeast Ohio Regional Sewer District (NEORS)

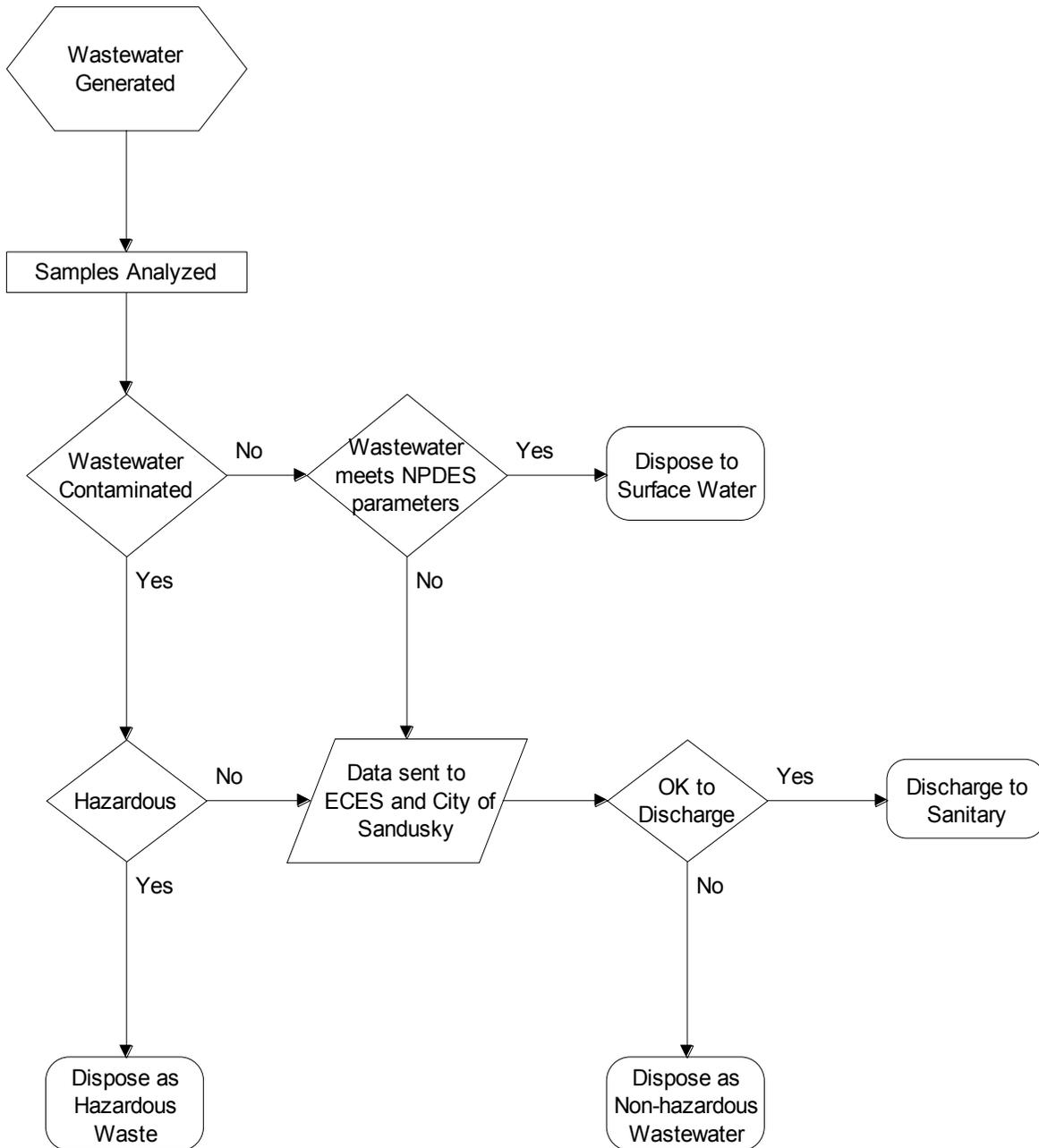
Nuclear Regulatory Commission (NRC)

APPENDIX B.—WASTEWATER DISPOSAL FLOW CHARTS

*Disposal of Wastewater
GRC – Lewis Field*



Disposal of Wastewater GRC - Plum Brook Station



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Chapter 4—Air Pollution Control

***NOTE:** This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was April 2012. The current version is maintained on the Glenn Research Center intranet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by Chief of Energy and Environmental Management Office (EEMO).*

1.0 PURPOSE

This chapter establishes policies and procedures pertaining to the design, construction, modification or operation of new or existing sources of air pollution at NASA John H. Glenn Research Center (GRC) at Lewis Field and Plum Brook Station.

This chapter conforms to GRC's Environmental Management System (EMS) as defined in Glenn Level Procedural Requirement (GLPR 8553.1C) and supports GRC environmental policy, promoting pollution prevention, regulatory compliance, and continuous improvement.

2.0 APPLICABILITY

The Requirements provided in this chapter applies to all employees (civil servants, support service contractors, tenant organizations, or other employees) who design, construct, modify, or operate new or existing sources of air pollution at GRC. This chapter is applicable to a lesser extent to other offsite entities involved with GRC activities.

3.0 BACKGROUND

The disposal of airborne wastes, air pollution, and the attempts to control it are in no way new concepts as noted even back in medieval England, where kings attempted to control the use of coal to prevent air pollution. World history, and especially the United States, shows many accounts of dangerous and fatal air pollution events. In the 1940s, Los Angeles began to experience severe air pollution problems called "gas attacks." In 1948, people were killed and injured from air pollution in Pennsylvania, and in 1966, Thanksgiving weekend in New York included many air pollution fatalities.

Many states began regulating air pollution. In 1955, the Federal Government decided that this problem needed to be dealt with on a national level and passed the Air Pollution Control Act of 1955, the Nation's first piece of Federal legislation on air pollution. The language of the bill identified air pollution as a national problem and announced the need for research and additional steps to improve the situation. Soon to follow, the Clean Air Act of 1963 with Amendments in 1965, 1966, 1967, and 1969 dealt with reducing air pollution by setting emissions standards for stationary sources, setting standards for auto emissions, expanding local air pollution control programs, establishing air quality control regions, setting air quality standards and compliance deadlines for stationary source emissions, and authorizing research on low-emissions fuels and automobiles.

Although technically an amendment, the Clean Air Act of 1970 was a major revision and set much more demanding standards. It established new primary and secondary standards for ambient air quality, set new limits on emissions from stationary and mobile sources to be enforced by both state and Federal governments, and increased funds for air pollution research. In 1990, the Federal government again revised the Clean Air Act to address five main areas: air quality standards, motor vehicle emissions and alternative fuels, toxic air pollutants, acid rain, and stratospheric ozone depletion. In many ways, this law set out to strengthen and improve the existing regulations.

4.0 POLICY

It is GRC policy to design, install, modify, or operate all air pollution sources in compliance with all local, state, and Federal laws, codes, standards, requirements, and permit conditions.

5.0 RESPONSIBILITIES

5.1 All Employees (Civil Service, Support Service Contractor, Tenant Organization Employees, or Other) Shall

- Contact EEMO with any questions concerning the disposal of airborne waste
- Operate air pollution sources in compliance with local, state, and Federal codes, standards, requirements, and permit conditions
- Notify EEMO in the event that a regulatory or permit condition is not attainable
- Immediately notify EEMO in the event that an air pollution source experiences a permit limit or regulatory excursion
- Maintain emissions-related records for air pollution sources as required by regulatory or permit conditions
- Provide requested emissions-related data to EEMO, such as but not limited to, material usage rates or emission estimates. See Appendix B for NASA Air Program Annual Emission Tracking Record
- Notify EEMO of any planned new air pollution sources as early in the design process as possible
- Notify EEMO of any alterations to new or existing air pollution sources or their operation as early as possible

5.2 Responsible Official (RO) Shall

- The Responsible Official shall be responsible for the overall air pollution control program. For Title V purposes, the Responsible Official retains all responsibility and shall provide signatory authority/submission of all applications, certifications and reports. For State Permit to Install (PTI) and Permit to Operate (PTO) Purposes, the Responsible Official may delegate the responsibilities to a single Duly Authorized Employee

5.3 Duly Authorized Employee, if deligated, Shall

- The Duly Authorized Employee shall act on behalf of the RO and shall provide signatory authority/submission of all applications, certifications and reports.

5.4 EEMO Shall

- Prepare air-related permit applications
- Prepare air-related reports to regulatory agencies
- Provide support and technical information on regulations regarding air pollution

5.5 SHED Shall

- Maintain and provide chemical purchase rate data
- Collect data, calculate and if necessary prepare and submit Toxic Release Inventory (TRI) reports also known as SARA Title III Section 313 Form R in accordance with Title III, Emergency Planning and Community Right-to-Know Act, of the Superfund Amendments and Reauthorization Act of 1986 and OAC Chapter 3745-100
- Should it become applicable, develop Risk Management Plans as per section 112r of the Clean Air Act and OAC Chapter 3745-104
- Ensure that all Asbestos renovation and demolition activities are conducted in accordance with 40 CFR 61 and OAC Chapter 3745-20

6.0 REQUIREMENTS

In matters involving interfacing with regulatory agencies, the GRC Energy and Environmental Management Office (EEMO) shall be the official point of contact in regards to air pollution. All new sources or air pollution and all modifications to existing sources of air pollution require review and concurrence of EEMO prior to installation and operation. This requirement includes changes in operational practice, relocation, and discontinuation or removal a source.

6.1 Signatory Authority

- For Title V purposes, the RO retains all responsibilities of the air program. The RO shall provide signatory authority/submission of all applications, and certifying the required reporting information.
- The Center Director is the RO. The Director of the Facilities and Test Directorate is the DAE. The GRC Environmental Program Manager is delegated the authority to sign reports, plans, certifications, and official correspondence with regulatory agencies as necessary.

6.2 Regulatory Compliance

All air pollution sources shall operate in conformance with the local, state, and Federal codes, standards, requirements, and permit conditions.

7.0 RECORDS

- Local, Ohio EPA, and Federal Air Permits shall be maintained by EEMO and/or Ohio EPA
- Copies of local, Ohio EPA, and Federal Air Permit applications shall be maintained by EEMO and/or Ohio EPA
- Monthly asbestos blanket permit records shall be maintained by SHED
- Copies of Emission Fee, Compliance, and other regulatory reports shall be maintained by EEMO and/or Ohio EPA

8.0 REFERENCES

Document	Name
42 United States Code (U.S.C.) Chapter 85	Air Pollution Prevention and Control
40 Code of Federal Regulations (CFR) Chapter 1, Subchapter C	Air Program
Ohio Revised Code 3701 and 3704	Air Pollution Control
Ohio Administrative Code 3745 Provisions	Environmental Protection Agency Terms and Conditions of all Air Permits

Energy and Environmental Management Office (EEMO)
Facilities and Test Directorate
Program Lead: Christie Myers
Web Curator: Sharon Maier, SGT
Last Revised: April 2012

APPENDIX A.—DEFINITIONS AND ACRONYMS

Air pollution (pollutants) — Excessive concentration of foreign matter in the air, which can adversely affect the well-being of the individual or can cause damage to property.

Clean Air Act (CAA) —Federal legislation that provides the basis for air pollution control efforts throughout the United States; components of the new law are multifaceted and encompass emissions, standards, monitoring, and enforcement.

Duly Authorized Employee (DAE) — If delegated, the Duly Authorized Employee shall act on behalf of the RO.

Emission —Release of pollutants into the air

Environmental Management System (EMS)

Environmental Protection Agency (EPA)

Glenn Level Procedural Requirement (GLPR)

Glenn Research Center (GRC)

Ohio Environmental Protection Agency (Ohio EPA)

Responsible Official (RO) — The Responsible Official is defined as the authority responsible for the overall air pollution control program.

Safety and Mission Assurance Directorate (SMAD)

Safety, Health, and Environmental Division (SHED)

Source — Any site or object that emits pollutants, including stationary and mobile sources.

APPENDIX B.—NASA AIR PROGRAM ANNUAL EMISSION TRACKING RECORD

NASA Air Program Annual Emission Tracking Record for _____

Source: _____

Permit ID: _____

Primary Contact: _____

Fuel Usage / Emission Summary

Month	Fuel Type /Material	Amount used (gal, cubic ft)	Hours of (fuel burning) operation	Quarterly % operating rate	Remarks
Jan					
Feb					
Mar					
Apr					
May					
Jun					
Jul					
Aug					
Sep					
Oct					
Nov					
Dec					
TOTAL				100%	

Fuel Type:

- 1 Natural Gas
- 2 JP-4
- 3 JP-5
- 4 JP-8
- 5 Jet A
- 6 #2 Fuel Oil
- 7 Diesel
- 8 Other (Please Specify)

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Chapter 5—Management of Hazardous Waste and Resource Conservation and Recovery Act (RCRA) Compliance

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center intranet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by Chief of Energy and Environmental Management Office (EEMO).

1.0 PURPOSE

This chapter establishes Glenn Research Center (GRC) policy and procedures and assigns responsibilities for the management of hazardous materials and hazardous and universal waste as defined in the Resource Conservation and Recovery Act (RCRA), Public Law 94–580. Soil that has been designated as hazardous is discussed in Chapter 23, Handling, Reuse, and Disposal of Soil. The management of solid waste is described in Chapter 10, Solid Waste.

2.0 APPLICABILITY

This chapter applies to all organizational elements of GRC Lewis Field and Plum Brook Station that are involved with the processing, storage, and handling of hazardous materials or the disposal of hazardous and/or universal waste.

3.0 BACKGROUND

The management, handling, storage, and disposal of hazardous materials and hazardous and universal waste are vitally important to GRC. Improper management of these items can pose a danger to human health and the environment and can incur enforcement actions from a number of regulatory agencies. As a research center, GRC uses a wide range of hazardous materials to conduct research activities, which in turn generate hazardous waste. GRC is required to manage this waste in a manner that protects employees and the environment and meets all Federal, state, and local rules and regulations.

The use of hazardous materials results in exposure to dangers associated with the characteristics of the material. For example, the use of aviation fuel in aeronautics research presents a fire hazard. Many classes of hazardous chemicals are used at GRC, including but not limited to, ignitable, corrosive, toxic, and reactive chemicals. Each chemical shall be managed according to the hazard that it poses and the applicable regulatory requirements. There are a variety of programs in place that are designed to assist employees in the safe handling, storage, and disposal of hazardous chemicals. The programs discussed in this chapter provide guidance to employees working with hazardous chemicals on the proper procedures for management and disposal of these materials and a point of contact should any hazardous waste management issues arise.

There are various areas at GRC used to store hazardous waste. These areas are managed by the Safety, Health and Environmental Division (SHED) Compliance Team (WM) and eventually are closed in accordance with the latest Ohio Environmental Protection Agency (OEPA) Closure Plan Review Guidance (CPRG). Since closure activities at each site may differ, specific procedures for closing a storage area will be determined at the time of closure.

4.0 POLICY

As a requirement of our waste minimization policy, GRC's first priority is to reduce the amount of hazardous material (chemical reduction) used, second is to reuse it, third is to recycle it, and fourth is to dispose of it as a hazardous waste. Special attention is given to the management of hazardous materials no longer required for ongoing institutional operations, research programs, or related activities. These hazardous materials shall be managed in a safe and proper manner following the requirements and standards prescribed in the RCRA regulations, GRC procedures, and all other applicable Federal and state regulations.

5.0 RESPONSIBILITIES

5.1 User

- Identifies and submits for proper management any hazardous material no longer needed for reuse, recycle, or disposal and does not dispose of hazardous materials by indiscriminately throwing the material or waste into a trash container or pouring it down a drain.
- Ensures that each hazardous material or waste to be turned in to the SHED Compliance Team (WM) is properly identified and labeled as to its contents and its potential hazard. Contact WM at 3-2124 for assistance in identifying and labeling materials and waste for disposal.
- Prepares a NASA C-260a, Waste Disposal Request, and submits it to WM for determination of proper disposal. The C-260a can be found in the GRC Electronic [Forms Library](#).



Figure 5.1.—Labels Used To Identify a Container of Used Oil.



Figure 5.2.—Labels Used To Identify a Container of Spent Solvent.

- Prepares, packages, marks, labels, and certifies the packaging and crating of materials and waste for shipment.
- Prepares uniform hazardous waste manifests for items such as oils, solvents, chemicals, and hazardous soils not covered by other Facilities Division (FD) contracts in accordance with EPA and DOT specifications.
- Tracks all manifests to ensure they are accounted for and properly signed.
- Maintains original files on all hazardous and nonhazardous waste shipments for regulating agency review.
- Coordinates and provides RCRA-required annual hazardous waste management training updates.
- Maintains records of required hazardous waste management training for GRC. Training records are maintained by WM and are submitted to the Training Office for entry into the System for Administration, Training, and Educational Resources at NASA (SATERN) database.
- Prepares regulatory-required and NASA reports, including the OEPA Annual Generators Report for Lewis Field.
- Educates personnel on hazardous material and waste handling and reduction.
- Establishes and maintains waste accumulation areas in accordance with RCRA regulations, including closure of these areas when warranted.

5.2.2 SHED Plum Brook Team

- Prepares regulatory-required and NASA reports, including the EPA Annual Generators Report for the Ohio EPA for Plum Brook Station.
- Recommends and educates the proper procedures to be followed when turning in hazardous material or disposing of hazardous waste. Also, provides guidance on hazardous material and hazardous waste handling and waste reduction/minimization.
- Determines whether hazardous material can be reused, recycled, or needs to be disposed of as hazardous waste.
- Reviews all hazardous material shipping documents for compliance with the provisions of Title 49 CFR, Subchapter C, Parts 105–178, DOT Hazardous Materials Regulations and Hazardous Waste Shipping Documents for compliance with the provisions of Title 40 CFR, Parts 260–370, EPA, Hazardous Waste Regulations.
- Tracks all manifests to ensure they are accounted for and properly signed.
- Maintains original files on all hazardous and nonhazardous waste shipments for regulating agency review.
- Coordinates and provides RCRA-required annual hazardous waste management training updates.
- Educates personnel on hazardous material and waste handling and reduction.

5.3 Plum Brook Management Office

- Maintains all records on required waste management and DOT training for Plum Brook Station staff.
- Coordinates the transfer of the hazardous materials and waste to Building 9206 for temporary storage (90-day maximum for material determined to be a hazardous waste), while a means of reuse, recycle, or disposal is determined.
- Notifies SHED Compliance Team through the use of a NASA C-260a to arrange for a waste disposal contractor to pick and dispose of the hazardous waste.

5.4 Property and Equipment Management

Property and equipment management is a part of the Logistics and Technical Information Division (LTID), and is responsible for the management of NASA-owned property. Documentation of excess property that may pose an environmental hazard is forwarded to WM by an Equipment Services Representative for review to determine if the item can be sold as excess property or must be disposed of as hazardous material.

6.0 REQUIREMENTS

- Waste accumulation site managers will notify WM at 3-2124 for a hazardous waste pickup when the container is three-fourths full or has been in storage for 60 or more days.
- All offsite shipment of waste shall be coordinated with WM.
- All hazardous waste manifests shall be signed by a designated member of SHED or the Plum Brook Station Environmental Manager.

6.1 Training

- Employees that work with hazardous materials and generate hazardous waste are required to attend RCRA Hazardous Waste Management training annually. This training is conducted by WM and is entered into each employee's SATERN training record.
- Facility personnel who manage hazardous waste materials must complete training that teaches them to perform their duties in a way that ensures GRC compliance with EPA training requirements listed in 40 CFR 265.16 and with the Occupational Safety and Health Administration (OSHA) training requirements listed in 29 CFR 1910.120.
- Facility personnel that manage hazardous material or waste for transportation shall meet the DOT training requirements listed in 49 CFR 172.700.

6.2 Guidance

- Check workarea for chemicals that can be reduced in volume or are no longer needed. If any are found, notify supervisor and WM about minimizing or disposing of them.
- Check workarea for chemical-, oil- or fuel-type waste and if any are found, ask supervisor or WM if they are considered hazardous waste. Prepare a Waste Disposal Request (NASA C-260a) and submit to WM for pickup and disposal.
- Ensure that all hazardous waste is stored for no longer than 60 days in a workarea and different waste types are not mixed in the same container. Also, check that the container is labeled, covered, and not leaking.
- Discuss ideas with supervisor and WM that might help reduce the volume of hazardous waste generated or allow reuse or recycling of hazardous materials.

6.3 Storage Area Closures

When a storage area is identified for closure, all activities related to the closure shall be coordinated with OEPA in accordance with the OEPA CPRG.

7.0 RECORDS

All of the following records are maintained by SHED.

- U.S. EPA 8700-22, Uniform Hazardous Waste Manifest
- Land Disposal Restriction (LDR) form
- Ohio Environmental Protection Agency Annual Generators Report
- Notification of Regulated Waste Activity, EPA 8700-12
- RCRA Hazardous Waste Management Training Record

8.0 REFERENCES

The following reference items apply to RCRA closure documentation.

Document number	Document name
29 CFR, Part 1910, Subpart H	OSHA Hazardous Waste Operations and Emergency Response

40 CFR, Part 61, Subpart M	National Emission Standard for Asbestos (NESHAPS)
40 CFR, Parts 260–265	Protection of Environment
40 CFR, Part 266	Recycling
40 CFR, Part 268	Land Disposal Restrictions
40 CFR, Part 273	Universal Wastes
40 CFR, Part 279	Used Oil
41 CFR, Parts 101–142	Utilization and Disposal of Hazardous Material and Certain Categories of Property
49 CFR, DOT, Parts 100–177	Hazardous Materials Definitions
NPD 8500.1B	NASA Environmental Management
NSS/FS 1740.7	Safety Standard for Handlers of Hazardous Materials
Public Law 94–580	Resource Conservation and Recovery Act
OAC 3745	Ohio EPA Hazardous Waste Regulations
OEPA CPRG	Ohio Environmental Protection Agency Closure Plan Guidance, October 2009

APPENDIX A.—DEFINITIONS AND ACRONYMS

Closure.—The process of cleaning a formerly utilized hazardous waste management area in a manner that minimizes the need for further maintenance, eliminates the possibility of a future release of hazardous waste, and properly disposes or decontaminates contaminated equipment, structures and soil.

Closure Plan Review Guidance (CPRG)

Code of Federal Regulations (CFR)

Department of Transportation (DOT)

Environmental Protection Agency (EPA)

Facilities Division (FD)

Glenn Research Center (GRC)

Hazardous material.—A substance or material that has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and which has been so designated. Title 49 CFR, Part 171.8.

Hazardous waste.—Any substance or combination of wastes in solid, liquid, semisolid, or gaseous form which, because of its quantity, concentration, or physical, chemical, or infectious characteristics may (1) cause or significantly contribute to any increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness or (2) pose a substantial present or potential hazard to human health, safety, or environment when improperly stored, treated, transported, disposed of, or otherwise managed. This includes wastes that singly, or in combination, require special handling, treatment, or disposal because they are, or may be, ignitable, radioactive, corrosive, reactive, toxic infectious, an irritant, or a strong sensitizer. For the purpose of this chapter it means any material that is subject to the Uniform Hazardous Waste Manifest requirements of the U.S. Environmental Protection Agency (U.S. EPA) as specified in Title 40 CFR, Part 262.

Land Disposal Restriction (LDR) form

Logistics and Technical Information Division (LTID)

NASA Policy Directive (NPD)

National Emission Standard for Asbestos (NESHAPS)

Occupational Safety and Health Administration (OSHA)

Ohio Environmental Protection Agency (OEPA)

Plum Brook Station (PBS)

Resource Conservation and Recovery Act (RCRA)

Safety, Health and Environmental Division (SHED)

Solid waste.—A solid waste is a material that, in general practice, is any discarded material not specifically excluded by the Resource Conservation Recovery Act (RCRA). A discarded material is any material (solid, liquid, or contained gas), which is abandoned (disposed, burned, or incinerated), recycled, or considered inherently wastelike. Basically, any material that does not have a continuing usefulness and is being discarded may be defined as a solid waste.

System for Administration, Training, and Educational Resources at NASA (SATERN)

Universal waste.—Any of the following hazardous wastes that are managed under the universal waste requirements of 40 CFR, Part 273: (1) batteries as described in 273.2; (2) pesticides as described in 273.3; (3) mercury-containing equipment as described in 273.4; and (4) lamps as described in 273.5.

Waste Management (WM)

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Chapter 6—Pollution Prevention, Sustainability, and Recycling

***NOTE:** This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.*

1.0 PURPOSE

In compliance with the [Pollution Prevention Act of 1990](#), this chapter establishes policies and procedures for the reduction, reuse, and recycling of solid waste generated at the NASA Glenn Research Center (GRC). It also delineates GRC's pollution prevention (P2) and sustainability annual plan. The P2 and sustainability plan conforms to the requirements of GRC's Environmental Management System (EMS) specified in NPD [5800.1B](#), NASA Environmental Management, NASA Procedural Requirements (NPR) [8553.1](#), NASA Environmental Management System, and International Organization for Standardization (ISO) 14001 as defined in Glenn Level Procedural Requirement (GLPR) 8553.1. This reference supports GRC's environmental policy, which promotes P2, regulatory compliance, and continuous improvement. This chapter also satisfies the waste minimization requirements of the [Resource Conservation Recovery Act \(RCRA\)](#) for GRC.

Executive Order (EO) [13514](#), Federal Leadership in Environmental, Energy, and Economic Performance, requires Federal agencies to consider life-cycle costs and savings to reduce waste, energy, water consumption, and other possible detrimental environmental effects, while achieving sustainable behaviors.

2.0 APPLICABILITY

This chapter is applicable to all civil servant and contractor employees assigned to GRC or associated with GRC who generate waste. GRC shall eliminate or reduce pollution at the source through process changes, reengineering material substitution, and education. The following source-reduction elements are included:

- Quantity of each chemical entering the waste stream or being recycled, treated, or disposed of
- Best management practices opportunities for source reduction
- Techniques to identify source-reduction opportunities

3.0 BACKGROUND

This chapter delineates GRC's comprehensive plan for preventing pollution, reducing waste, conserving energy, and preserving natural resources to satisfy RCRA hazardous waste minimization requirements, as well as P2 and sustainability requirements.

The initial baseline established for the evaluation of P2 activities was 1994, thus the status analysis relates to that baseline. However, the reference baseline may shift for certain goals as specified by law, regulation, EO, and/or policy. EO 13148 establishes new goals that seem to imply the use of year 2000 data as the baseline. The appropriate baseline reference data will be used to analyze progress toward each goal or target. These accepted baselines shall be fully delineated in the P2 and Sustainability Metrics System document.

The P2 and Sustainability Plan was designed to be consistent with the goals and requirements of laws and regulations (Federal, state, and local); EO [13514](#); NASA mission and policies; other EOs; the Federal policy on sustainability; Environmental Excellence for the Twenty-First Century, a NASA strategy document; other NASA policies; and GRC's environmental policies and programs.

GRC is committed to environmental protection consistent with environmental laws and regulations outlined in EO [13514](#), which requires agencies to measure, manage, and reduce greenhouse gas emissions toward Agency-defined targets. It describes the process by which agency goals shall be set and reported to the President. EO [13514](#) also requires agencies to meet a number of energy, water, and waste-reduction targets, including

- 30-percent reduction in vehicle fleet petroleum use by 2020
- 26-percent improvement in water efficiency by 2020
- 50-percent recycling and waste diversion by 2015

- Sustainability requirements met by 95 percent of all applicable contracts by 2010
- Implementation of the 2030 net-zero-energy building requirement
- Implementation of the storm water provisions of the Energy Independence and Security Act of 2007, Section 438
- Development of guidance for sustainable Federal building locations in alignment with the Livability Principles put forward by the Department of Housing and Urban Development, the Department of Transportation, and the Environmental Protection Agency (EPA).

***NOTE:** On October 5, 2009, President Obama signed EO 13514, which sets sustainability goals for Federal agencies and focuses on making improvements in their environmental, energy, and economic performance. “This EO builds on the momentum of the Recovery Act to help create a clean energy economy and demonstrates the Federal government’s commitment, over and above what is already being done, to reducing emissions and saving money.” This EO consolidates and strengthens six EOs and establishes updated goals, practices, and reporting requirements for environmental, energy, and transportation performance and accountability for the Federal Government. It revokes EOs 13423, 13149, 13148, 13134, 13123, and 13101.*

4.0 POLICY

GRC has adopted an environmental policy as part of the recently adopted EMS, which states: “GRC operates in a manner that preserves and protects the environment through pollution prevention, the continual improvement of our operations, and complying with regulations.”

The guidance is designed to conform to the requirements of EO 13514, setting sustainability goals for Federal agencies, and it focuses on making improvements in their environmental, energy and economic performance. This requires Federal agencies to establish a goal for solid waste diversion. GRC is committed to reducing solid waste and diverting it from landfills. GRC has set the goal of a 75-percent solid waste diversion rate by 2011. This recycling source shall operate in conformance with local, state, and Federal codes, standards, requirements, and permit conditions and in line with the U.S. EPA and Ohio EPA waste-disposal regulations and shall follow the guidance in the following documents:

- NPR 8530.1A, Affirmative Procurement Program and Plan for Environmentally Preferable Products (This document sets policy to reduce the amount of material ending up in landfills through the procurement of environmentally preferable goods and services.)
- EO 12780, Public Law (PL) 94–580 as amended, the Resource Conservation and Recovery Act (RCRA) of 1976
- Section 6002 of the RCRA (This section is required by the EPA to issue Comprehensive Procurement Guidelines (CPGs) containing designated items that are or can be made with recovered materials.)
- Federal Agency Recycling and the Council on Federal Recycling and Procurement Policy
- Ohio Revised Code (ORC), Title 37, Chapter 3734, Ohio Solid and Hazardous Waste Disposal Law
- EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management
- DOD 6050.5, U.S. Government Disposal Methods Guidelines
- Defense Reutilization and Marketing Service (DRMS)–M 6050.1, Environmental Compliance for the DRMS Hazardous Property Program, June 1990 edition (newest version)

***NOTE:** In response to EOs and NPR 8820.3, GRC’s environmental office has revised and updated the GRC P2 implementation plan.*

5.0 RESPONSIBILITIES

GRC is committed to reducing solid and hazardous waste from GRC activities. This is a joint effort between GRC employees, the Logistics and Technical Information Division, the Facilities Division, the Procurement Management

Division, and the Safety, Health and Environmental Division (SHED). Subsections 5.1 to 5.11 list the responsibilities for each area.

5.1 Glenn Research Center Civil Servants and Support Service Contractors

- Participate in GRC's recycling zero-waste program and other waste-reduction opportunities
- Submit P2 proposals for support and/or funding consideration
- Apply P2 principles to facility operation and practice sustainability strategies in making purchasing decisions and GRC policies
- Keep abreast of information on GRC's recycling program, which is distributed on SHED's recycling Website, on Today@Glenn, and in other announcements
- Ensure that collection containers are not contaminated with nonrecyclable or hazardous materials
- Support the recycling lead and inform the lead about waste-reduction opportunities or improvements for GRC's recycling program
- Support the monitoring of recycling collection areas and arrange for pickup if necessary
- Notify the recycling lead about container needs or problems
- Evaluate waste-reduction opportunities within the area

5.2 Solid Waste Management Contracting Officer's Technical Representative

- Awards recycling contracts
- Collects recyclable items in a timely manner throughout GRC
- Provides day-to-day management of the collection of all recyclables
- Provides SHED's recycling program lead with monthly recycling collection reports
- Participates in GRC's waste-reduction opportunities
- Keeps abreast of information on GRC's recycling program, which is distributed on the SHED Website
- Works with SHED to address and minimize contamination problems
- Works with SHED's recycling coordinator to pursue additional recycling or improvement opportunities
- Assists in monitoring recycling collection areas and arranging for pickup if necessary
- Monitors recycling activities to ensure compliance with established recycling procedures
- Provides documentation to SHED's recycling program lead every month
- Maximizes the collection of recyclable materials and maximizes the proceeds to GRC from the sale of recyclable materials
- Provides support for transporting recycling containers
- Identifies opportunities to divert recyclables during the disposal process
- Works with SHED's P2 team to develop GRC's annual plan for solid waste management
- Prepares the Waste Contractor Annual Certificate of Compliance
- Supports the composting program

5.3 Building Managers and Facility Managers

- Participate in GRC's waste-reduction opportunities
- Ensure that facility personnel follow established procedures

- Help ensure that relevant recycling procedures and notification announcements are posted in prominent building locations
- Support the monitoring of recycling collection containers in and out of the building
- Help ensure that collection containers are not contaminated with nonrecyclable or hazardous materials
- Ensure that construction or rehabilitation projects include waste-reduction requirements
- Provide SHED with annual waste-diversion weight totals
- Support SHED's waste-reduction or -diversion opportunities; suggest improvements to GRC's recycling program

5.4 Contracting Officers and Contracting Officer's Technical Representatives

- Participate in GRC's waste-reduction opportunities
- Help ensure that personnel follow established procedures
- Support relevant recycling procedures and the updating of notification announcements
- Support efforts to ensure that recycling and waste-reduction programs requirements are met
- Support efforts to ensure that contracts include recycling and waste-reduction language
- Support efforts to ensure that contracts include green alternatives language

5.5 Safety, Health, and Environmental Board

- Establishes annual EMS targets
- Conducts an annual management review of the P2 and sustainability program and activities
- Provides feedback and support on P2 and waste-reduction opportunities

5.6 Safety, Health and Environmental Division

- Oversee P2 and sustainability activities, in particular, regarding consistency with the EMS and other NASA policies and requirements
- Targets P2 projects for consideration and implementation with collaborative efforts
- Supports efforts to obtain funding for selected projects when feasible
- Serves as GRC's official representative on recycling and P2-related topics with Government and private parties

5.7 Recycling Program Lead

- Manages and oversees GRC's recycling program
- Manages and oversees GRC-approved P2 projects
- Plans and administers cost-effective recycling programs at GRC
- Establishes goals and requirements for P2 and sustainability, including hazardous waste minimization goals
- Promotes waste minimization, P2, and sustainability activities throughout GRC
- Tracks GRC's progress in meeting established goals
- Provides support, guidance, training, and assistance to organizational units in implementing waste-reduction or diversion opportunities to meet or exceed established goals
- Collects monthly metrics on the recycling program and other P2 waste-reduction opportunities
- Seeks out new waste-reduction diversion opportunities

- Supports and reviews the solid waste management plan
- Operates recycling facilities
- Provides regulatory support to the Procurement Management Division, Facilities Division, and Logistics and Technical Information Division on solid-waste reduction and recycling initiatives
- Delineates the roles and responsibilities of individuals, teams, and organizations necessary to implement this plan
- Specifies GRC's baseline waste generation, material usage, and environmental impact data needed to identify activity opportunities for waste reduction and reference for P2 and sustainability progress
- Establishes program metrics and evaluation procedures that relate the results of activities to goals
- Supports and assists in EMS goals, including resource allocation for cost effectiveness

5.8 Pollution Prevention and Sustainability Committee Leader

- Pursues new P2 and sustainability opportunities
- Takes the lead on all P2 activities
- Is responsible for all P2 reporting and documentation
- Chairs the P2 team meetings
- Supports and updates P2 metrics and Pollution Prevention Opportunity Assessment (PPOA) evaluation criteria
- Forms collaborations and seeks funding for selected P2 activities
- Promotes P2 throughout GRC
- Serves as a member of all PPOA projects and P2 implementation subcommittees
- Analyzes all P2 activities for effectiveness
- Reports to the SHED Chief on progress toward meeting EMS objectives and targets
- Updates this plan annually following EMS objectives and targets

5.9 Pollution Prevention and Sustainability Committee

- Includes committee lead and appropriate representatives from SHED, Logistics (recycling and purchasing), Facilities Division, researchers, representatives from specific key buildings, and volunteers within GRC.
- Serves as an advisory group for the entire P2 program
- Reviews and recommends P2 metrics and PPOA evaluation criteria
- Collects P2 and sustainability data as needed for records, reports, and documents
- Performs PPOAs (may be performed by a smaller project committee) and prepares the reports when necessary
- Reviews PPOAs (full committee)
- Recommends P2 implementation projects
- Reviews P2 activities and results
- Reviews and approves the annual P2 report to the SHED Chief and the Safety, Health, and Environmental Board

5.10 Waste Management Team

- Handles the diversion of universal waste for recycling

- Handles all disposals of hazardous waste
- Supports and assists in waste-reduction opportunities
- Reports waste-reduction activities to recycling lead

5.11 Chemical Management Team

- Participates in GRCs waste-reduction opportunities
- Seeks out new waste-reduction diversion opportunities
- Reports reduction activities to recycling lead

NOTE: Chemicals and hazardous materials must be ordered through the Chemicals Purchasing Office. Green purchases shall be given preference. See Chapter 9 of the [Environmental Programs Manual](#) for details. For questions about chemicals, contact the Chemical Management Team.

6.0 REQUIREMENTS

6.1 Overview of Goals and Metrics for the Pollution Prevention and Sustainability Program (NASA Policy Directive (NPD) 8820.2C and NPR 8530.1A)

GRC is required to reduce solid waste by finding and using methods of reuse and recycling for all discarded materials, complying with all Federal, state, and local regulations governing the generation, storage, shipment, and disposal of solid wastes and the conservation of resources.

This plan shall be revised annually or more often to address new requirements promulgated by regulatory agencies or established by NASA Headquarters and GRC. These requirements are covered in more depth in Chapter 9 of the [Environmental Programs Manual](#).

Individuals and teams are encouraged to submit ideas and actively participate in the implementation of selected P2 and resource conservation projects. The GRC Environmental Award Program is available to encourage all GRC employees to contribute to the P2 and environmental protection effort. All entrants shall receive recognition, and more substantial awards shall be given to individuals or teams that submit and/or implement winning ideas that contribute to the P2 effort and/or best reduce GRC's detrimental impact on the environment. A suggestions and ideas status log shall be maintained as a record tracking the current status of each potential project or activity in SHED.

GRC's policy dictates that annual environmental objectives and targets be established by the Safety, Health, and Environmental Board as part of the EMS operation. The EMS P2 projected outcomes for GRC during fiscal year 2009/2010 include

- Identify at least ten P2 activities
- Implement at least five P2 activities

Annual P2 and sustainability opportunities at GRC will be defined and maintained as a record. This list includes at least six possible activities that might contribute toward the EMS annual P2 targets.

In addition to establishing and maintaining a current status log of projects, SHED shall maintain a P2 and sustainability metrics system record to specify metrics and measurement techniques for P2 and sustainability activities. An appropriate set of metrics shall be applied to each activity, and these shall be noted in each PPOA. Some activities will require official approval of a document to indicate completion; others will be measured by the number of units reduced, recycled, and/or removed from the disposal stream. These project-specific metrics may be expanded or modified by the P2 committee to best address each project, and further adjustments may be made during implementation by the project P2 implementation committee.

GRC's [Environmental Programs Manual](#) further delineates this policy and all related implementation strategies. Successful implementation of the P2 and Sustainability Plan is a high priority goal for GRC.

6.2 Specific Components of Pollution Prevention and Sustainability Program

6.2.1 Source Reduction

GRC shall eliminate or reduce pollution at the source through process changes, reengineering material substitution, and education. Specific source-reduction elements follow:

- Quantity of each chemical entering the waste stream, being recycled, treated, or disposed of
- Source-reduction best management practices used for each chemical
- Techniques to identify source-reduction opportunities

6.2.2 Reuse

Reuse—the second choice in the hierarchy of preferred waste management practices—has been a goal of excess activities and other Logistics and Technical Information Division programs.

6.2.3 Recycling

GRC has established goals for solid-waste prevention and recycling. Recycling is the third choice in the hierarchy of preferable environmental waste-management practices. Components of GRC's waste streams that can be recycled include (but are not limited to) paper, cardboard boxes, aluminum cans, scrap metals, tires, used oil, and batteries. GRC used these guidelines in setting up its recycling program:

- Train GRC personnel to participate in the recycling program
- Obtain appropriate approval and support for the recycling program
- Market recyclables and monitor costs and revenues associated with the recycling program.

6.2.4 Composting

GRC has established goals for composting food scraps. The components of GRC's waste streams that can be composted include (but are not limited to) paper; cardboard boxes; and scrap vegetables, fruits, egg shells, and meat. GRC used these guidelines in setting up its compost program:

- Train GRC personnel to participate
- Obtain appropriate approval and support for the program
- Monitor costs and reduction associated with the program.

6.2.5 Treatment and Disposal

Treatment and disposal are the next two choices in the hierarchy of preferable environmental waste management. Treatment is for pollution that cannot be prevented or recycled in an environmentally safe manner. Disposal of hazardous waste is the last resort used. It shall be done legally and in an environmentally safe manner at a permit-holding treatment storage and disposal facility.

6.2.6 Affirmative Procurement

GRC has established an affirmative procurement program for purchasing environmentally preferable materials as identified by the EPA in 40 Code of Federal Regulations (CFR) 247, Comprehensive Procurement Guideline for Products Containing Recovered Materials. GRC uses NASA Procedures and Guidelines (NPG) 8530.1A, to ensure affirmative procurement of environmentally preferable goods and services.

6.2.7 Recycling Reimbursable Funds

Funds collected from the sale of recycled goods are reinvested in the recycling program and used to support GRC's recycling and P2 and sustainability program. Proposals can be submitted for review under the —Funds Management Plan.” See [SHED's recycling](#) homepage. The requirements in this chapter apply to all personnel and contractors performing work at GRC.

6.2.8 Energy Management

GRC's facilities maintenance organization is a prime participant in GRC's energy-management program, which was developed in accordance with NPR **8570.1**, Energy Efficiency and Water Conservation. The maintenance organization participates in identifying and is responsible for implementing operations and maintenance procedures and/or process improvements that are in GRC's Energy Efficiency and Water Conservation Five-Year Plan. Responsible maintenance organization staff members help conduct energy audits. GRC's Energy Management and Control Systems data must be analyzed during the maintenance organization's planning to identify changes that indicate maintenance problems or imminent equipment or system breakdowns. This energy-management program support must be integrated into the maintenance organization's Annual Work Plan and 5-year plan.

6.3 Verification Approach

SHED takes several proactive steps to verify that GRC employees and contractors are complying with source reduction, reuse, recycling, composting, treatment and disposal, affirmative procurement, and environmental training requirements.

6.3.1 Awareness Presentations and Training

SHED provides awareness presentations and training, both onsite and offsite, to contracting officers, contracting officer's technical representatives, bankcard holders, Federal agencies, the vendor networking team, visitors, the community, and others. In addition, information is disseminated via Today@Glenn announcements, the SHED websites, and printed literature. Topics include limiting waste generation; preventing pollution; recycling; excessing equipment, furniture, office materials, and construction materials; affirmative (green) procurement; and proper treatment and disposal of waste.

6.3.2 Review of Statements of Work, Contracts, Contract Files, and Reports

Both during the initial process and during renewals, SHED examines statements of work (SOWs) and contracts for support services and larger contracts to ensure that language about purchasing green products, preventing pollution, reducing waste generation, and other environmental considerations (including facility design and market research) is included.

Contract files are reviewed to ensure that attendance at training and awareness sessions, purchases of green products, and waivers (NASA **C-138s**) have been documented. In addition, P-card purchases (documenting green purchases) are reviewed periodically.

6.3.3 Monitoring of Collections

Containers are monitored for use and possible contamination, and waste disposal monthly reports and weights of recyclable collections are reviewed. Universal and hazardous wastes are directed to the Waste Management Team for proper disposal.

6.3.4 Committee Participation

SHED chairs the P2 and Recycling Committees to identify objectives and align targets with EMS elements (see Section **5.8**).

6.3.5 Alternative Materials

Alternative materials are identified for requisitions when available.

6.3.6 Resource Conservation Recovery Act Reports

SHED collects green purchasing data from contractors and compiles and submits annual RCRA reports to meet Federal Acquisition Regulation (FAR) requirements.

6.3.7 Applicable documents

The following documents are used or examined during these verification steps: NASA **C-8095**, draft SOW, NASA **C-590**, NASA **C-150**, NF **1707**, P-Card, and NF **1634**.

7.0 RECORDS

Annual recycling and affirmative reports to NASA Environmental Tracking System (NETS).—Maintained by SHED.

Annual P2 report to NASA Headquarters.—Maintained by SHED.

Annual P2 and sustainability activities report.—Maintained by SHED.

Monthly P2 projects status log.—Maintained by SHED.

Project summaries.—Maintained by SHED.

Implementation projects reports.—Maintained by SHED.

NF **1634**, Contracting Officer Technical Representative (COTR)/Alternate COTR Delegation.—Original approved forms maintained by the appropriate contracts; copies maintained by SHED.

NF **1707**, Special Approvals and Affirmations of Requisitions.—Original approved forms maintained by the appropriate contracts; copies maintained by SHED.

8.0 REFERENCES

Document number	Document name
NPR 8530.1A	Affirmative Procurement Program and Plan for Environmentally Preferable Products
NPR 8553.1B	Environmental Management System, Chapter 1
EO 13148	Greening the Government Through Leadership in Environmental Management
EO 13514	Federal Leadership in Environmental, Energy, and Economic Performance
EO 12780, Section 6002	Resource Conservation Recovery Act
PL 94-580 , 1976, as amended	Federal Agency Recycling and the Council on Federal Recycling and Procurement Policy
ORC, Title 37, Chapter 3734	Ohio Solid and Hazardous Waste Disposal Law
DOD 6050.5	U.S. Government Disposal Methods Guidelines
DRMS-M 6050	Environmental Compliance for the DRMS Hazardous Property Program
NPD 8820.2C	Design and Construction of Facilities Resource Conservation and Recovery Act (RCRA). This act gives the EPA the authority to control hazardous waste from “cradle to grave.” This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also sets forth a framework for managing nonhazardous solid wastes.
CPG	Comprehensive Procurement Guidelines (CPG). This program is part of EPA’s continuing effort to promote the use of materials recovered from solid waste. Buying recycled-content products ensures that the materials collected in recycling programs will be used again in the manufacture of new products.
Section 6002	RCRA, Section 6002, Solid Waste Disposal Act. Congress authorizes the CPG program under this section (PDF, 6 pp, 51K). The EPA is required to designate products that are or can be made with recovered materials and to recommend practices for buying these products. Once a product is designated, procuring Agencies are required to purchase it with the highest recovered material content level practicable.
40 CFR 247	Protection of Environment, Comprehensive Procurement Guideline for Products Containing Recovered Materials. Part 247 of Title 40 prescribes policies and procedures for acquiring EPA-designated products through affirmative procurement programs required by the RCRA and EO 13514.

APPENDIX A.—DEFINITIONS AND ACRONYMS

Code of Federal Regulations (CFR)

Composting.—Decomposing organic waste, such as food scraps and yard trimmings, with microorganisms (mainly bacteria and fungi) to produce compost. Compost is organic material that can be used as a soil amendment or as a medium to grow plants.

Comprehensive Procurement Guidelines (CPG).—The Environmental Protection Agency CPG lists 54 items that can be purchased with recycled-content paper, re-refined oil, fly ash in concrete, and other environmentally beneficial materials. Federal agencies must require that 100 percent of purchases meet or exceed CPG unless a written justification or waiver is in effect.

Defense Reutilization and Marketing Service (DRMS)

Department of Defense (DOD)

Environmental Management System (EMS)

Environmental Protection Agency (EPA)

Executive Order (EO)

Federal Acquisition Regulation (FAR)

Glenn Level Procedural Requirement (GLPR)

International Organization for Standardization (ISO)

NASA Environmental Tracking System (NETS).—This NASA-wide system is utilized to track an extensive range of environmental data from all NASA facilities, including numerous pollution prevention and sustainability metrics.

NASA Glenn Research Center (GRC)

NASA Policy Directive (NPD)

NASA Procedures and Guidelines (NPG)

NASA Procedural Requirements (NPR)

Ohio Revised Code (ORC)

Pollution prevention (P2).—Any practice that reduces the amount of hazardous substances, pollutants, or contaminants entering the waste stream or otherwise released to the environment (including fugitive emissions) prior to recycling, treatment, or disposal, and that reduces the hazards to public health and the environment associated with the release of such substances.

Pollution Prevention Opportunity Assessment (PPOA).—A systematic evaluation of processes and operations to

- Characterize all aspects of the process or operation, including process flow, waste-generation patterns, material and power consumption, costs, manpower, and toxic chemicals
- Define the impacts that the process and related wastes have on the air, water, and land
- Associate impacts and wastes with specific unit operations
- Assign related costs and liabilities with specific wastes and management practices
- Identify environment-friendly alternatives

***NOTE:** A PPOA is a project-specific systematic evaluation of a process or operation to characterize all aspects of the process or operation, define the environmental impacts of the process, associate impacts and wastes with specific unit operations, and assign related costs and liabilities to specific wastes and management practices. Alternative products, processes, and operations that reduce environmental impacts, plus health and safety hazards are identified. Vendor information is included to facilitate rapid implementation of the PPOA. Considerations used to rank PPOAs for possible implementation include*

environmental compliance, facility mission impact, environmental benefits, ease of implementation, and cost savings. Because of paper-reduction opportunities and efficient use of personnel, PPOAs are bypassed when the benefits of an environmentally preferable alternative are obvious and readily available. The P2 committee will review P2 activities as well as any additional ideas solicited from all NASA personnel.

Public Law (PL)

Release.—Any planned or unplanned loss of toxic chemicals to the environment including air emissions, off-site transfers of chemicals, waste-water discharges, underground injections of waste, and wastes disposed of in onsite landfills. Examples include shipments of hazardous wastes to treatment, storage, and disposal facilities.

Resource Conservation Recovery Act (RCRA)

Safety, Health and Environmental Division (SHED)

Solid waste.—Any material that does not have a continuing usefulness and is being discarded may be defined as a solid waste; in general practice, a discarded material is any material (solid, liquid, or contained gas) that is abandoned (disposed of, burned, or incinerated), recycled, or considered inherently waste-like); any discarded material not specifically excluded by the Resource Conservation Recovery Act.

Statement of Work (SOW)

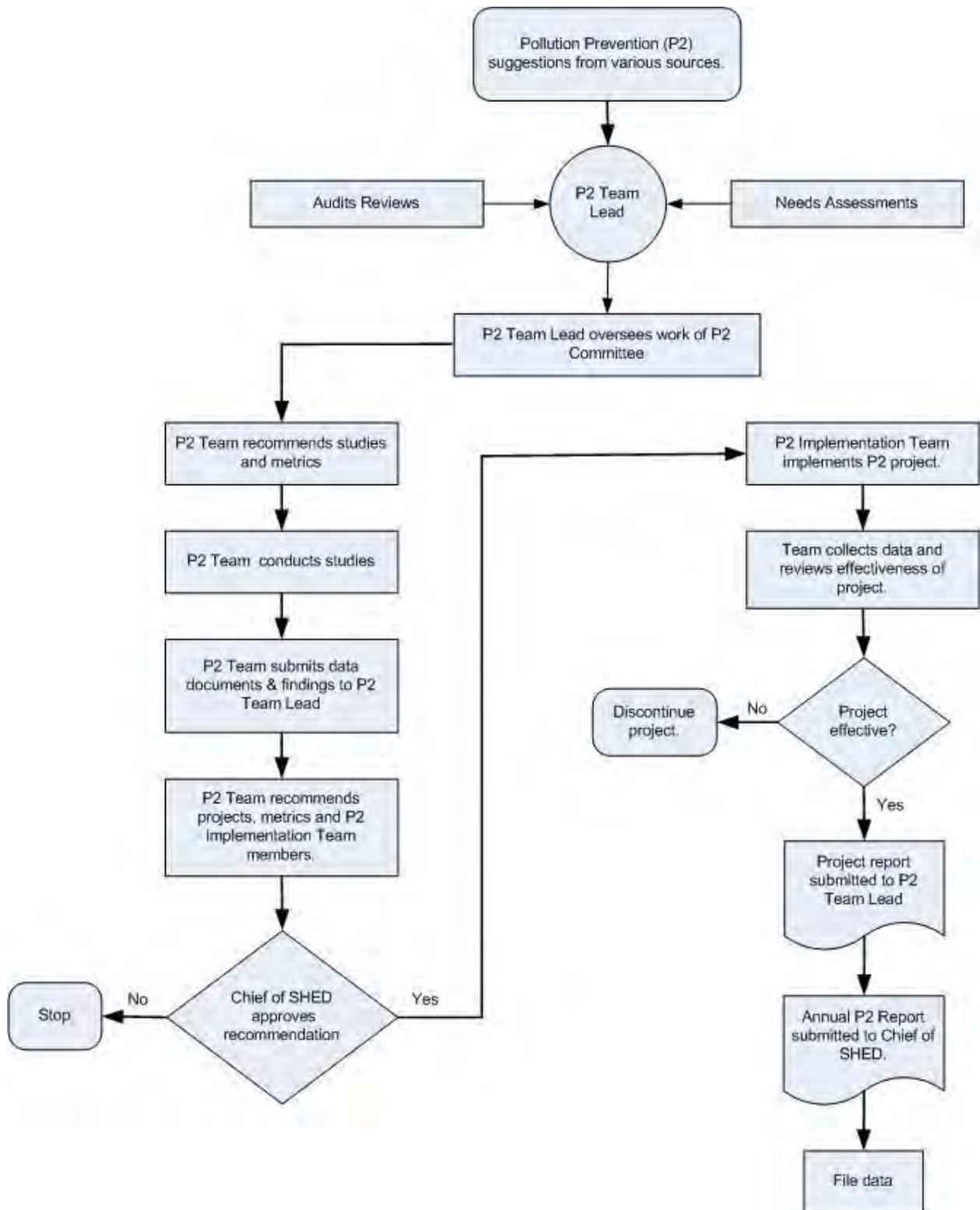
Sustainability.—The policy defined by several Executive Orders (13148, 13149, 13150, etc.) that requires Federal facilities to go beyond traditional P2 efforts. This strategy promotes the conservation of energy and materials and programs to minimize environmental impacts of Federal facilities as well as traditional P2 activities. The sustainability EOs also requires annual reports, which overlap substantially with the scope of P2 reports.

SHED keeps metrics on the quantity of materials collected, the funds recovered, and or disposal costs associated with recycling.

- Executive Order (EO) 13514 extends Federal procurement activities related to biobased products and services. Biobased products are made from renewable agriculture, animal, or forestry materials, such as vegetable-based lubricants, biofuels, compost, and construction materials.
- 40 Code of Federal Regulations 247. Part 247 prescribes policies and procedures for acquiring Environmental Protection Agency-designated products through affirmative procurement programs required by the Resource Conservation Recovery Act and EO 13423.
- The Resource Mandatory Advisory Notice is linked to affirmative procurement by showing the designated percentages of Comprehensive Procurement Guidelines (CPG) III Items. These CPG products can be found through the U.S. General Service Administration and the Defense Logistics Agency.

NOTE: Chapter 9 of the *Environmental Programs Manual* provides guidance for recycling compliance in the procurement process.

APPENDIX B.—POLLUTION PREVENTION FLOWCHART



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Chapter 7—Polychlorinated Biphenyls

***NOTE:** This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was November 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.*

1.0 PURPOSE

This chapter establishes policies pertaining to the handling and disposal of polychlorinated biphenyls (PCBs) at the NASA Glenn Research Center (GRC) Lewis Field (LF) and Plum Brook Station (PBS). This chapter supports GRC Environmental Policy, which promotes pollution prevention, regulatory compliance, and continuous improvement.

Following the guidelines and requirements in this chapter will help achieve the GRC environmental objective of containing and eliminating PCBs. Effectiveness of the PCB management program can be tracked through the PCB Annual Document Log. For an example of the Annual Document Log, see Appendix B, Figure B.2.a.

2.0 APPLICABILITY

The guidance provided in this chapter is applicable to GRC employees and contractors at all levels who are in any way involved in the handling, storage, transportation, and/or disposal of PCBs at any time at LF and PBS.

3.0 BACKGROUND

PCBs are a class of organic compounds consisting of a biphenyl (two benzene rings) with 1 to 10 chlorine atoms attached. PCBs have low water solubilities and low vapor pressures at room temperature. They have high solubilities in most organic solvents, oils, and fats. They also have high dielectric constants, very high thermal conductivity, high flash points, and are chemically almost inert, being extremely resistant to oxidation reduction, addition, elimination, and electrophilic substitution. Their production was banned in the 1970s because of their toxicity, which poses a threat to people and the environment.

In the past, PCBs were widely used in various applications, often as dielectric fluid in transformers and capacitors. LF has 12 outdoor electrical substations operating at voltage levels of 34,500 volts or higher. Transformers operating at the 2400-volt level are also spread out over a variety of locations throughout the lab. See Appendix 6 of the Lewis Field Integrated Contingency Plan (ICP). The ICP is Annex Q of the GRC Emergency Preparedness Plan. Some PCB-contaminated items remain onsite. There are no transformers containing PCBs at Lewis Field. The last PCB contaminated transformer was removed from the premises in 2000.

At PBS, there are six substations operating at voltage levels of 34,500 volts and several transformers operating at 7200 volts (see Emergency Preparedness Plan, Appendix 12 and PBS Integrated Contingency Plan, Annex Q). There are no transformers containing PCBs at Plum Brook Station.

4.0 POLICY

It is GRC policy to maintain information such as inspection logs, annual document logs, and disposal records in a readily accessible manner and to dispose of PCB articles in compliance with Federal and State regulations.

5.0 RESPONSIBILITIES

The Energy and Environmental Management Office manages disposal and recordkeeping for PCB articles.

5.1 Facilities Division

Facilities Division personnel are stewards of electrical equipment at GRC. Stewardship includes Systems Design, Maintenance and Operation of all system assets from 138kVA to 120 V. When equipment containing PCBs is removed by institutional support or capital project contractors it shall be delivered to Bldg. 215 for proper storage until disposition is determined.

5.1.1 Electrical Power Distribution System Maintenance and Operation Personnel

M & O personnel dispose of PCB contaminated items at LF through the Waste Management (WM) personnel and (as required) the Property Disposal Officer.

5.1.1 High Voltage System Manager

High Voltage System Manager shall oversee the High Voltage Systems Design, Maintenance and Operations as defined by FD management.

5.1.2 Technical Consulting

The Facilities Division provides technical advice to EEMO on relevant aspects of PCB management, disposal, inspection, and recordkeeping as they relate to infrastructure and institutional assets.

5.2 Safety, Health and Environmental Division—Chemical Management Program Lead

The Chemical Management Program Lead shall review all chemical orders. Any chemical order which knowingly contains PCBs, will not be processed.

5.3 Energy and Environmental Management Office

EEMO defines the requirements for PCB management, disposal, inspection, and recordkeeping. Also these functions are performed by EEMO at Lewis Field and Plum Brook Station sites.

5.3.1 General Responsibilities

- Conducting internal audits of the GRC PCB Program.
- Maintaining PCB-related records in Building 21 Room 135, including the PCB annual document log.
- Including information pertaining to PCBs into the ICP.
- Keeping records of PCB spills with other emergency incident reports.
- Maintaining Environmental Programs Manual, Chapter 7.
- Advising the Facilities Division and PBS contractors of the requirements for proper disposal of PCB items as shown in flowchart of Appendix B (Figure B.1).
- Conducting monthly inspections of the PCB storage area and keep records in Building 215.
- Managing storage of PCB items for disposal.

5.3.2 Emergency Response Team

- Emergency Response Team is personnel from SHED, EEMO, and the Office of Protective Services
 - EEMO has a primary responder with backup coverage
 - Support and clean up tasks are performed by the Waste Management contractor.
 - ERT members respond to spills of PCBs and other spills.
 - Team is certified in HAZWOPER and is required to attend annual 8hr refreshers

5.3.3 Lewis Field PCB Disposal Procedure

When equipment containing PCBs is removed by institutional support or capital project contractors it shall be delivered to the Central Chemical Storage Facility (Building 215) and stored there until these materials are disposed/removed from Lewis Field.

Spill response materials are stored in Building 215.

5.4 Plum Brook Station

When equipment containing PCBs is removed by institutional support or capital project contractors it shall be delivered to Building 9206 for proper storage and stored there until these materials are disposed/removed from PBS.

5.4.1 PBS Environmental Project Manager

- Maintains records of interest, including disposal records and annual document logs. These records are filed Building 7141, Room 118.
- Ensures PCB-contaminated material is stored in Building 9206 prior to shipment.
- Maintains spill response materials in Building 9206.

6.0 REGULATORY REQUIREMENTS

6.1 PCB Marking Requirements (40 CFR 761)

Articles containing PCBs shall be marked with “*Large PCB Mark*,” M_L labels (Figure 6.1).



Figure 6.1.—M_L Labels.

6.2 Annual Document Log (40 CFR 761)

Annual document logs provide a record of disposal information from the previous calendar year and a list of PCB items in storage at the end of the year.

6.3 Integrated Contingency Plan (40 CFR 112)

Any oil-filled equipment with a capacity greater than or equal to 55 gallons shall be included in the NASA GRC ICP.

6.4 Training (40 CFR 112)

Oil-handling personnel shall be trained in the proper operation and maintenance procedures to prevent discharges. Training shall also cover discharge protocols; applicable laws, rules, and regulations; and the requirements of the ICP (See Environmental Programs Manual, Chapter 8).

6.5 Incident Reporting Information System

Incident Reporting Information System (IRIS) reports shall be reported as per GSM-21 of the Glenn Safety Manual, Mishap and Close Call Reporting, Investigating, and Recordkeeping.

7.0 RECORDS

- PCB Annual Document Logs.—See examples in **Error! Reference source not found.**, Figure B.2.a, and Figure B.2.b, kept in Building 21 Room 135.
- Emergency Incident Reports are kept in Building 21, Room 135.
- For information on IRIS reports, see GSM-21.

8.0 REFERENCES

Document number	Document name
15 USC 2605	15 USC 2605, Toxic Substances Control Act
29 CFR 1910	29 CFR 1910, Occupational Safety and Health Standards
40 CFR 112	40 CFR 112, Oil Pollution Prevention

40 CFR 761	40 CFR 761, Polychlorinated Biphenyls Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
GRC ICPs	Annex Q, Emergency Preparedness Plan
GLM-QS-8500.1	NASA GRC Environmental Programs Manual, Chapter 5—Management of Hazardous Materials and Waste for Reduce, Reuse, and Disposal
GLM-QS-8500.1	NASA GRC Environmental Programs Manual, Chapter 8—Spill Control
GLM-QS-1700.1	NASA Glenn Safety Manual, Chapter 21—Mishap and Close Call Reporting, Investigating and Recordkeeping

APPENDIX A.—DEFINITIONS AND ACRONYMS

Annual Document Log.—A record of waste handling at a facility

Energy and Environmental Management Office (EEMO)

Environmental Management System (EMS)

Glenn Research Center (GRC)

Integrated Contingency Plan (ICP)

Incident Reporting Information System (IRIS)

Lewis Field (LF)

Pollution Prevention (P2) Program

Plum Brook Management Office (PBMO)

Plum Brook Station (PBS)

Polychlorinated biphenyl (PCB)

PCB article.—Any manufactured article, other than a PCB container, that contains PCBs and PCB items.

PCB article container.—A device containing PCBs or PCB articles whose surfaces have not been in direct contact with PCBs (example: a drum containing a nonleaking capacitor).

PCB container.—A device containing PCBs or PCB articles whose surfaces have been in direct contact with PCBs (example: a drum containing a leaking capacitor).

PCB-contaminated transformer (PCB item).—A transformer with a PCB concentration between 50 and 500 ppm.

PCB equipment.—A manufactured item other than a PCB container, PCB article container, or which contains a PCB article (example: fluorescent light ballast).

PCB item.—A PCB article, PCB container, PCB article container, or PCB equipment container that contains PCBs.

PCB transformer (PCB item).—A transformer with a PCB concentration above 500 ppm.

Quarterly inspection.—A visual inspection for leaks from PCB transformers conducted once every 3 months.

Safety and Health Division (SHeD)

Waste Management (WM)

APPENDIX B.—ADDITIONAL FIGURES

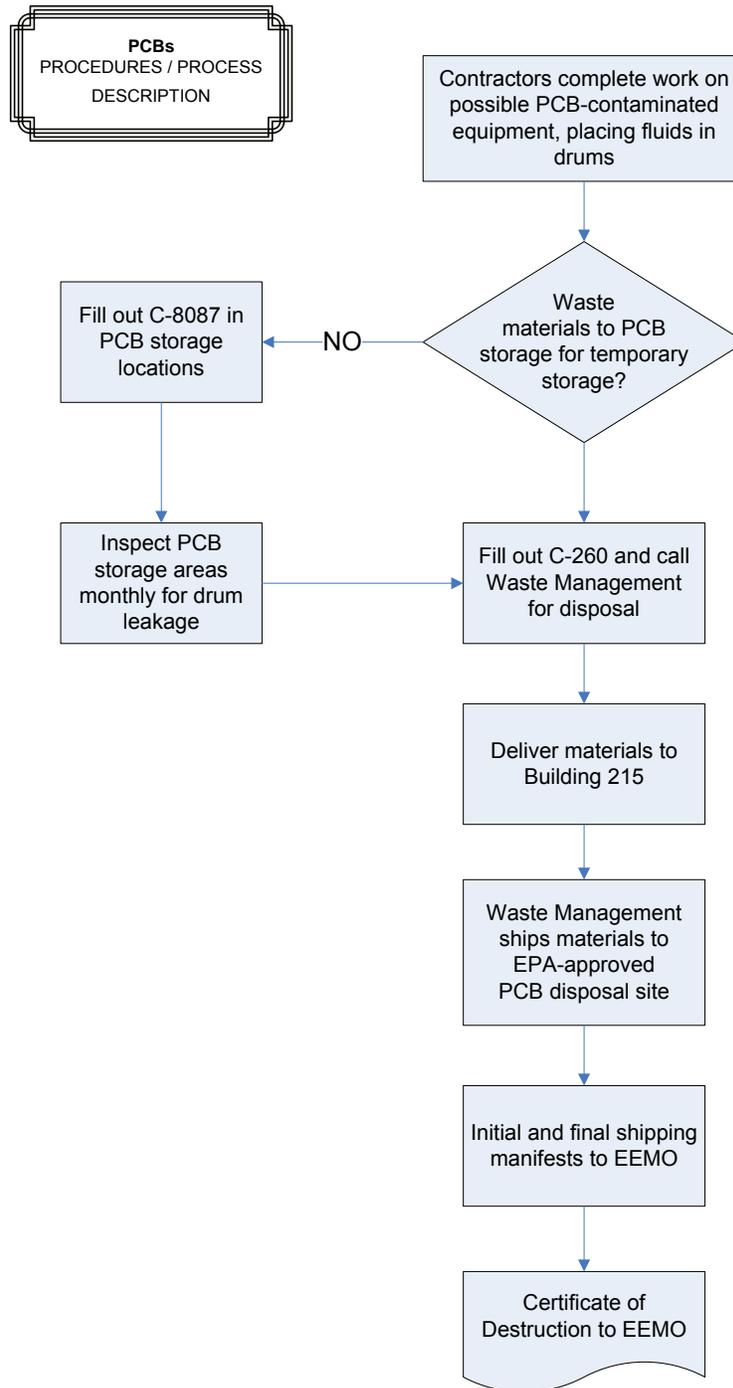


Figure B.1.—PCB Disposal Procedures.

Cover page

PCB ANNUAL DOCUMENT LOG
CALENDAR YEAR ____
FOR
NASA GLENN RESEARCH CENTER
AT LEWIS FIELD
21000 BROOKPARK ROAD
CLEVELAND, OHIO 44135
EPA I.D. NUMBER OH0800005035

Figure B.2.a.—Annual Document Log Format.

PCB ANNUAL DOCUMENT LOG –

DATE SHIPPED	MANIFEST DOCUMENT	UNIQUE ID# CONTAINER	OUT OF SERVICE/ ACCUM. START	WEIGHT (KG.)	METHOD OF DISPOSAL	DATE OF DISPOSAL	DESCRIPTION OF CONTENTS

ITEMS IN STORAGE:

UNIQUE ID# CONTAINER	OUT OF SERVICE/ ACCUM. START	WEIGHT (KG.)	DESCRIPTION OF CONTENTS

Figure B.2.b.—Annual Document Log Format.

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Chapter 08—Spill Control

***NOTE:** This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.*

1.0 PURPOSE

This chapter establishes policies and procedures for dealing with activities at the NASA Glenn Research Center's (GRC's) Lewis Field (LF) and Plum Brook Station (PBS) that have the potential to contaminate indoor or outdoor environments with spilled material (i.e., oil, chemicals, asbestos, etc.). This chapter supports GRC's Environmental Policy, which promotes pollution prevention, regulatory compliance, and continuous improvement.

Following the guidelines in this chapter will help achieve some of GRC's environmental objectives and targets such as the reduction of spills and releases, the identification and implementation of pollution prevention activities, and the reduction of solid waste generation. Achievement of these targets can be tracked through the following records: Spill Occurrence Reports for LF (Appendix B) and Emergency Notification Checklists for PBS (Appendix C), pollution prevention committee and plan results (NASA Environmental Tracking System, NETS), and the number of regulatory noncompliances found.

2.0 APPLICABILITY

This chapter applies to all civil servant and contractor employees assigned to GRC sites and to any NASA-controlled, Government-owned facilities associated with GRC.

3.0 BACKGROUND

The Clean Water Act (CWA) became law in 1972. The CWA is the cornerstone of surface-water quality protection in the United States. (The CWA does not deal directly with ground water or with water quantity issues.) The statute employs a variety of regulatory and nonregulatory tools to sharply reduce direct pollutant discharges into waterways, to finance municipal wastewater treatment facilities, and to manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the Nation's waters so that they can support the protection and propagation of fish, shellfish, wildlife, and recreation in and on the water. Section 311 of the CWA prohibits the discharge of oil or hazardous substances into or upon the navigable waters of the United States.

The CWA also introduced a permit system for regulating point sources of pollution. Point sources include industrial facilities (including manufacturing, mining, oil and gas extraction, and service industries), municipal government facilities, and other government facilities (such as military bases). Point sources may not discharge pollutants to surface waters without a permit from the National Pollutant Discharge Elimination System. This system is managed by the U.S. Environmental Protection Agency (EPA) in partnership with State environmental agencies. EPA has authorized 46 States to issue permits directly to the discharging facilities.

4.0 POLICY

It is GRC policy to minimize spill potential through engineering and administrative controls. LF has about 60 outfalls and 26 oil/water separators. PBS has 7 outfalls and 3 oil/water separators. Should a spill occur, containment and cleanup procedures shall be promptly implemented to assure compliance with all applicable Federal, State, and local regulations and to minimize the effect on the environment.

5.0 RESPONSIBILITIES

When the responsible entity at PBS differs from its LF counterpart, the name of the responsible entity at PBS is given in parentheses following the task. The basics for LF Emergency Response and Incident Investigation are shown in Figure D.1 and Figure D.2, respectively (Appendix D).

5.1 Users

The primary responsibility for spill prevention lies with the user. Members of the Safety, Health and Environmental Division (SHED) are available to advise users on prevention and response. Reactions to spills shall be preplanned and incorporated into use procedures. Specific responsibilities follow:

- Report any spill by calling the GRC dispatcher at 911 from an internal phone, at 216-433-8888 from an external phone at LF, or at 419-621-3222 from an external phone at PBS; if possible, identify the material and estimate the volume of material released
- For small spills, attempt to contain and clean up the spill
- For larger spills, take immediate emergency response actions as required, or attempt to contain the spill, if practical. If there are any questions with regard to safety, evacuate the area
- Block access to floor drains, storm drains, or drainage ditches by using absorbent booms and floor drain covers
- Maintain the containment and cleanup supplies necessary for small spills, and request any additional supplies needed from Waste Management at LF at 3-2124 or from the support service contractor environmental staff at PBS
- Complete a NASA Incident Reporting Information System (IRIS) [Quick Safety Incident Report](#)
- Receive spill-prevention training and proper response to spills of hazardous materials
- Dispose of waste derived from the cleanup of petroleum products as hazardous or controlled waste
- For a nonemergency spill, fill out a NASA [C-260a](#), Waste Disposal Request, and e-mail it to Waste Management for waste disposal services
- Provide accounting information to waste management staff to pay for post-spill waste-disposal needs
- Investigate the causes of the spills, recommend procedures or policies to prevent a reoccurrence, and provide information to SHED

5.2 Discoverer of a Spill

- Reports the spill to the LF dispatcher at 911 or 216-433-8888 or to the PBS dispatcher at 911 or 419-621-3222)
- Remains on the scene to provide information to the incident commander

5.3 Safety, Health and Environmental Division Staff Members

- Maintain the Integrated Contingency Plan and update it as necessary
- Maintain current lists of reportable quantities and provide technical advice to responders
- Provide technical advice to the person who spilled the material
- Assist the emergency management specialist in investigations
- Assist in determining exposure limits, personal protective equipment, and containment measures
- Serve as the incident commander during the response and recovery phases of environmental emergencies as stated in the GRC Emergency Preparedness Plan
- Maintain spill containment and cleanup supplies (support service contract environmental staff at PBS)
- Provide for containment and cleanup at spill sites whenever possible, usually through an independent contractor (support service contract environmental staff at PBS)
- Maintain complete documentation for initial reports on all reportable quantity spills and for nonreportable quantity spills

- Notify the GRC Office of Community and Media Relations (Plum Brook Management Office (PBMO) environmental manager at PBS)
- Advise GRC and NASA Headquarters senior management of the event as necessary

5.4 Glenn Security Management Office

5.4.1 Security Dispatcher

The security dispatcher notifies Federal and local regulatory agencies of spills as required in the Integrated Contingency Plan (PBMO environmental manager at PBS)

5.4.2 Security Personnel

Security personnel provide area control, security, and initial response at spill sites (support service contract environmental staff at PBS)

5.4.3 Emergency Management Specialist

The emergency management specialist develops and maintains the LF Emergency Preparedness Plan.

6.0 REQUIREMENTS

6.1 Response

Security shall make the initial response to spills, followed by representatives of SHED, who then act as incident commanders for remedial actions (Figure **D.1**)

6.2 Reporting

The following organizations shall receive information on reportable spills:

6.2.1 Lewis Field

- Brook Park Fire Department
- National Response Center
- Ohio EPA
- U.S. EPA
- Cuyahoga County Emergency Communication System
- Northeast Ohio Regional Sewer District

6.2.2 Plum Brook Station

- Perkins Township Fire Department
- National Response Center
- Ohio EPA
- U.S. EPA
- Erie County Emergency Management Agency

6.3 Training

6.3.1 Incident Commanders

Incident commanders shall be trained in the use of the Incident Command System (ICS).

6.3.2 Oil-Handling Personnel

Oil-handling personnel shall be trained in the proper operation and maintenance of equipment to prevent discharges; discharge protocols; applicable laws, rules, and regulations; and the contents of the Spill Prevention, Control and Countermeasure plan

6.4 Recordkeeping

SHED's Operation Team shall keep records of incidents at LF (Appendix B), and SHED's PBS Team shall keep records of incidents at PBS (Appendix C). Spills that require reporting to regulating agencies are also recorded in the NETS system.

7.0 RECORDS

Spill Occurrence Reports.—Maintained by SHED. Includes the date, location, material spilled, quantity, and remedial actions taken. Hard copies of LF spill reports are kept in Building 6, Room 113 (Appendix B). SHED shall provide Spill Occurrence Reports to the Cuyahoga County Emergency Communications System and the Ohio EPA when requested.

NETS electronic reports.—Maintained by SHED.

IRIS reports made by responsible parties to track remedial actions.—Maintained by SHED.

8.0 REFERENCES

Document number	Document name
40 CFR 110	Code of Federal Regulations (CFR), U.S. EPA, Discharge of Oil
40 CFR 112	U.S. EPA, Oil Pollution Prevention
40 CFR 302	U.S. EPA, Designation, Reportable Quantities, and Notification
40 CFR 355	U.S. EPA, Emergency Planning and Notification, Subpart C
40 CFR 761	U.S. EPA, Polychlorinated Biphenyls Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
OAC 3750-25	Ohio Administrative Code (OAC), Emergency Release Notification
ORC 3750.06	Ohio Revised Code (ORC), Notice of Release of Hazardous Substance
33 U.S.C. 1321	U.S. Code (U.S.C), Oil and Hazardous Substance Liability
GLM-QS-8500.1	Glenn Manual (GLM), Environmental Programs Manual, Chapter 5, Management of Hazardous Materials, Hazardous Wastes, and Universal Wastes for Reuse, Recycling, and Disposal

APPENDIX A.—DEFINITIONS AND ACRONYMS

Clean Water Act (CWA)

Code of Federal Regulations (CFR)

Emergency Preparedness Plan.—Plan used to provide specific procedures for awareness, prevention, preparedness, response, and recovery for a variety of situations.

Emergency response team (ERT)

Environmental Protection Agency (EPA)

Glenn Research Center (GRC)

Glenn Manual (GLM)

Hazardous material (HAZMAT).—Any material defined as hazardous under 29 CFR 1910.120(c) including material presenting health and/or physical hazard. Such material has one or more toxic, flammable, corrosive, or reactive properties. All materials listed under Title M of the Superfund Amendments and Reauthorization Act of 1986 (SARA) are included.

Hazardous Waste Operations and Emergency Response (HAZWOPER)

Integrated Contingency Plan.—Plan used to provide compliance with a multitude of regulations.

Incident Reporting Information System (IRIS)

Lewis Field (LF)

Nonreportable quantity spills.—Spills that present low hazard potential to workers or to the environment. Non-reportable quantity spills can be contained and cleaned up with only minor difficulty. Cleanup of nonreportable spills is the responsibility of the GRC directorate managing the material. Outside support may not be necessary for nonreportable quantity spills.

NASA Environmental Tracking System (NETS)

Nonreportable quantity spills.—Spills that present low hazard potential to workers or to the environment. Non-reportable quantity spills can be contained and cleaned up with only minor difficulty. Cleanup of nonreportable spills is the responsibility of the GRC directorate managing the material. Outside support may not be necessary for nonreportable quantity spills.

Ohio Administrative Code (OAC)

Ohio Revised Code (ORC)

Plum Brook Management Office (PBMO)

Plum Brook Station (PBS)

Reportable quantity (RQ) spills.—Spills that often involve large volumes of material and present significant hazards to workers or to the environment. Any spill reportable under Environmental Protection Agency Regulations, 40 CFR 302, shall be considered a reportable quantity spill. Reportable quantity spills include, but are not limited to, the materials and volumes given in appendix B of 40 CFR 355 under extremely hazardous substances (EHS) reportable quantities or Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) reportable quantities. All expenses incurred as a result of a reportable quantity release will be charged to the organization responsible for the spill.

Safety, Health and Environmental Division (SHED)

U.S. Code (U.S.C.)

APPENDIX B.—SPILL OCCURRENCE REPORT

NASA GLENN RESEARCH CENTER/LEWIS FIELD

21000 Brookpark Road

Cleveland, Ohio 44135

(To be filled out by NASA GRC SHED Operations Team)

NAME OF FACILITY: _____

NAME OF OPERATOR: _____

DATE OF SPILL: _____ TIME: _____

DATE OF INITIAL FACILITY OPERATION: JANUARY 23, 1941

LOCATION: _____

MAXIMUM STORAGE CAPACITY: _____ NORMAL DAILY THROUGHPUT: _____

MATERIAL SPILLED: _____ AMOUNT: _____

CAUSE: _____

CORRECTIVE ACTION TAKEN: _____

PLANS FOR PREVENTING RECURRENCE: _____

SPILLAGE ENTERED: NO WATERWAY AFFECTED: _____

STORM SEWER _____ ABRAM CREEK _____ OR ROCKY RIVER _____

SANITARY SEWER _____ INDUSTRIAL WASTE SEWER _____

PAVED AREAS _____ GRASS / GRAVEL AREAS _____

SECONDARY CONTAINMENT (EXPLAIN) _____

B.1 Spill Occurrence Report Notifications

BROOK PARK FIRE DEPARTMENT 7-433-1212

DATE: _____ TIME: _____ BY: _____

OHIO ENVIRONMENTAL PROJECTION AGENCY 7-1-800-282-9378

DATE: _____ TIME: _____ BY: _____

NATIONAL RESPONSE CENTER 7-1-800-424-8802

DATE: _____ TIME: _____ BY: _____

COUNTY EMERGENCY COMMUNICATION SYSTEM CENTER 7-771-1365

DATE: _____ TIME: _____ BY: _____

WHEN APPLICABLE:

REGIONAL SEWER DISTRICT: 7-641-6000

DATE: _____ TIME: _____ BY: _____

FAIRVIEW PARK FIRE DEPARTMENT 7-333-1212

DATE: _____ TIME: _____ BY: _____

CLEVELAND FIRE DEPARTMENT 7-664-6664

DATE: _____ TIME: _____ BY: _____

APPENDIX C.—EMERGENCY NOTIFICATION CHECKLIST
NASA GLENN RESEARCH CENTER AT PLUM BROOK STATION
6100 COLUMBUS AVENUE, SANDUSKY, OHIO 44870

Name of Reporter: _____ Telephone: _____

Location: _____

Type of Incident: Oil Spill Chemical Spill
 Fire Injury/Medical

Time of Incident: _____ Date of Incident: _____

Name and Quantity of Materials Involved: _____

Source/Cause (if not known, do not speculate): _____

Expected Duration/Magnitude of Ongoing Release (if applicable): _____

Weather Conditions: _____

Corrective Actions Taken to Remove/Mitigate Incident: _____

Possible Hazards (Environmental or to Human Health) outside Facility: _____

Extent of Injuries, Property Damage, and/or Environmental Damage (if known): _____

Spillage Entered:

Storm Sewer _____ Stream _____

Sanitary Sewer _____ Paved Areas _____

Grassed Areas _____ Secondary Containment: _____

Other: _____

Pathways by which Public may be Affected (if applicable): _____

Plans for Preventing Recurrence: _____

Comments: _____

Notified?

SPILL OCCURRENCE REPORT NOTIFICATION

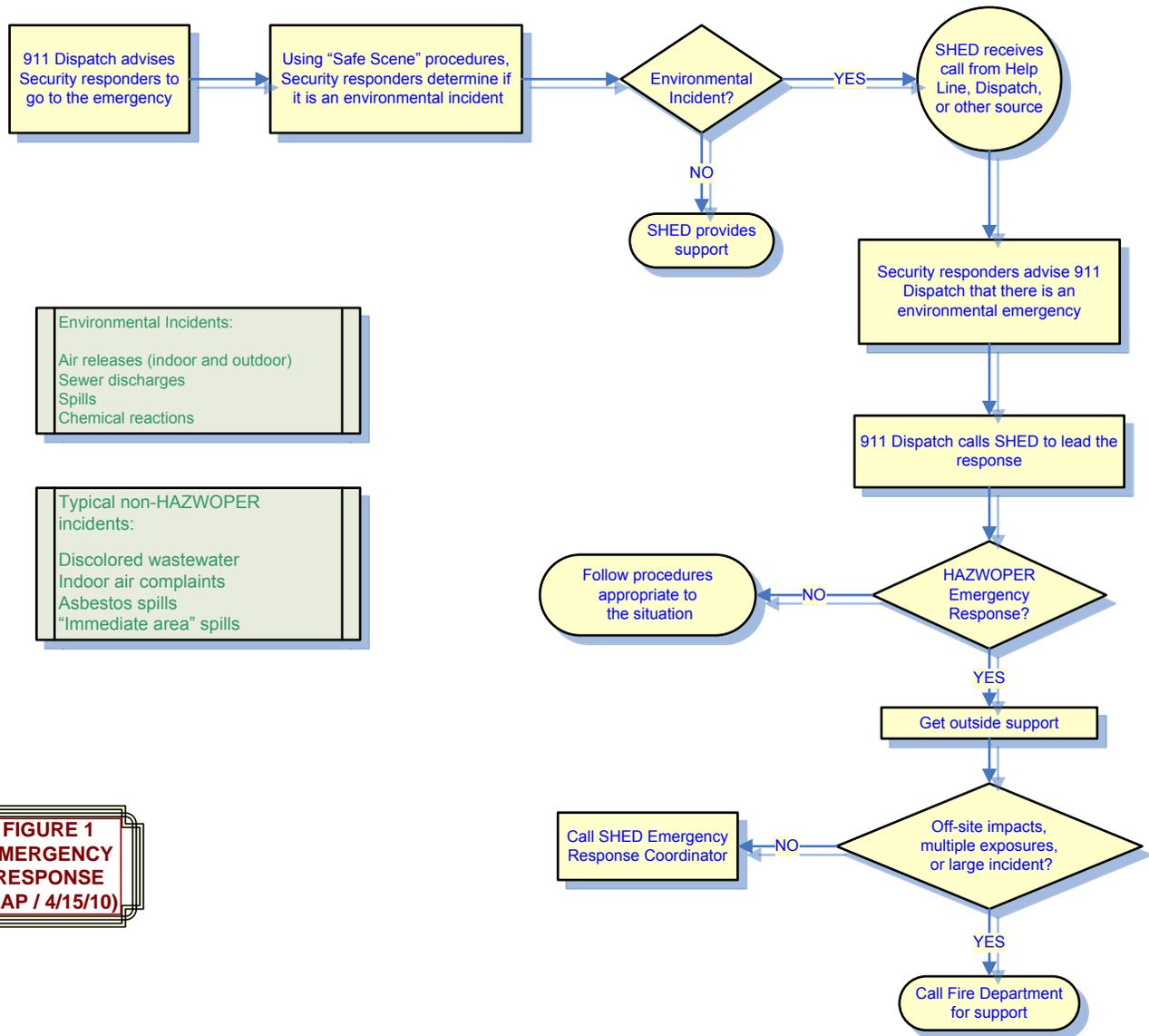
MANDATORY NOTIFICATION IF INCIDENT
PRESENTS A RISK OUTSIDE THE FACILITY

- Y N GRC SHED Plum Brook Team-Robert Lallier (216-905-1229)
Date: _____ Time: _____ By: _____
- Y N GRC Office of Community & Media Relations (216-433-2037)
Date: _____ Time: _____ By: _____
- Y N GRC Emergency Preparedness Coordinator –Seth Harbaugh (216-513-6538)
Date: _____ Time: _____ By: _____
- Y N Ohio Environmental Protection Agency (800-282-9378 within 30 minutes of discovery)
Date: _____ Time: _____ By: _____
- Y N National Response Center (800-424-8802 within 1 hour of discovery)
Date: _____ Time: _____ By: _____
- Y N Erie County Emergency Management Agency (419-627-7617)
Date: _____ Time: _____ By: _____

ADDITIONAL EMERGENCY SERVICES
REQUESTED AS THE SITUATION WARRANTS

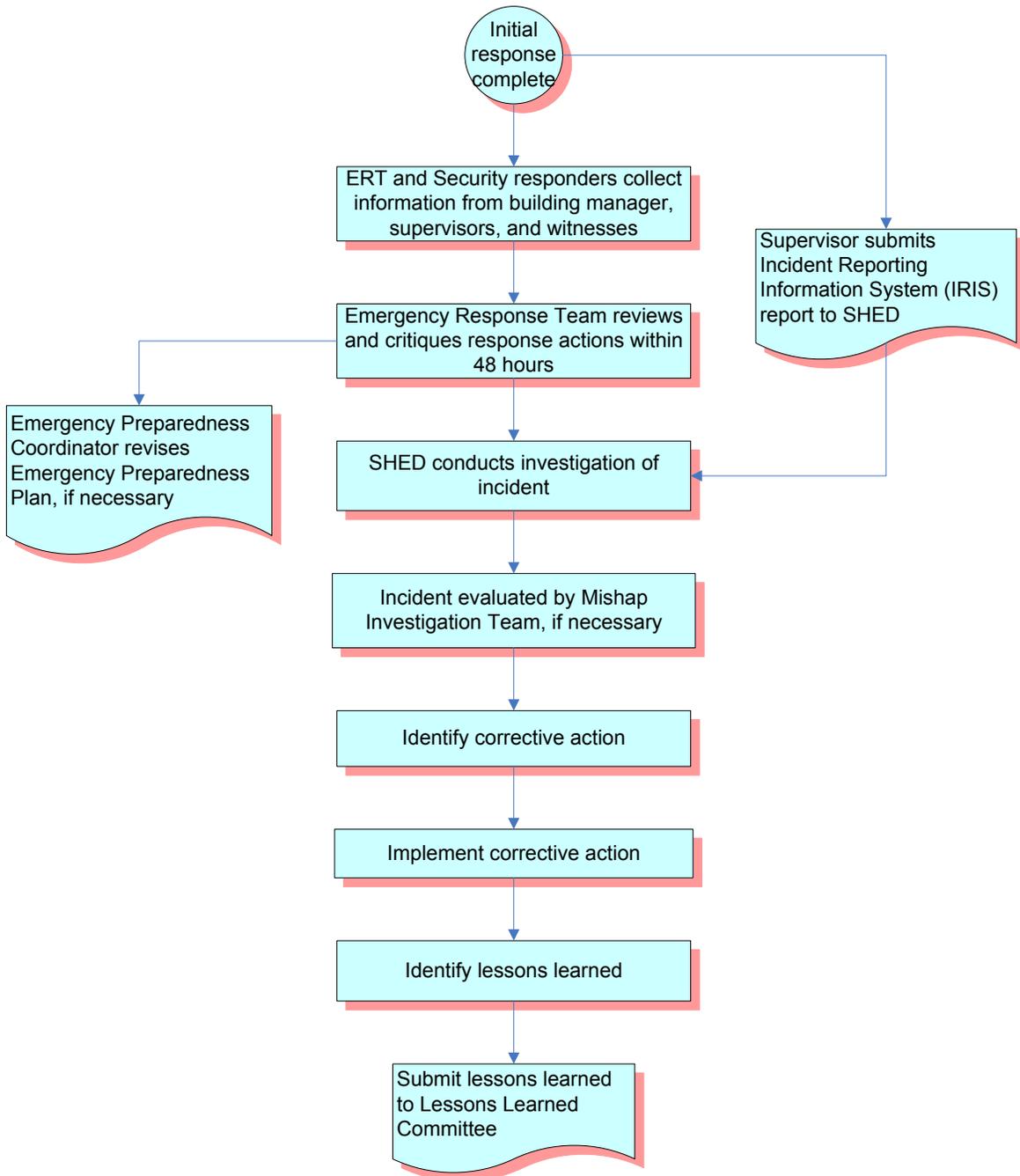
- Y N Perkins Township Fire Department (419) 626-1334
Date: _____ Time: _____ By: _____
- Y N Perkins Township Police Department (419) 627-0824
Date: _____ Time: _____ By: _____
- Y N Firelands Regional Medical Center-Dr. Michael Babiuch (419) 557-7455
Date: _____ Time: _____ By: _____
- Y N Erie County Water Department (419) 627-7666 or (419) 625-2372 (emergency after 4 PM)
Date: _____ Time: _____ By: _____
- Y N Columbia Gas of Ohio (Natural Gas) (800) 344-4077
Date: _____ Time: _____ By: _____
- Y N Ohio Edison (Electric Power) (800) 228-9176
Date: _____ Time: _____ By: _____
- Y N Erie County Sheriff's Office (419) 627-7668
Date: _____ Time: _____ By: _____
- Y N Ohio State Highway Patrol (419) 625-6565
Date: _____ Time: _____ By: _____

APPENDIX D.—PROCESS FLOW CHARTS



**FIGURE 1
 EMERGENCY
 RESPONSE
 (DAP / 4/15/10)**

Figure D.1.—Emergency response.



**FIGURE 2
INCIDENT
INVESTIGATION
(DAP/4-15-10)**

Figure D.2.—Incident investigation.

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Chapter 9—Green Procurement: Affirmative Procurement, Biopreferable Products, and Environmentally Preferable Products

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes minimum requirements for purchasing Government-mandated affirmative procurement, environmentally preferable, and biopreferable products. These requirements will minimize solid waste, prevent pollution, and save energy and other resources at the NASA Glenn Research Center (GRC). Presidential Executive Order (EO) **13514**, Federal Leadership in Environmental, Energy, and Economic Performance, requires that Federal agencies consider life-cycle costs and savings, allowing for reduction in waste, energy, water consumption, and other possible detrimental environmental impacts, while achieving sustainable behaviors. This chapter conforms to GRC's Environmental Management System (EMS) as defined in Glenn Procedural Requirement (GLPR) 8553.1. This reference supports GRC's environmental policy, which promotes pollution prevention, regulatory compliance, and continuous improvement.

2.0 APPLICABILITY

This chapter applies to all personnel at GRC's Lewis Field and Plum Brook Station (civil servants, support service contractors, offsite contractors, tenant organizations, and other employees) who design, construct, or procure designated items using appropriated Federal funds.

3.0 BACKGROUND

GRC is committed to environmental protection consistent with environmental laws and regulations outlined in EO **13514**. This chapter can help GRC purchasers to identify Federal green buying requirements, find green products and services, calculate the costs and benefits of purchasing choices, and manage green purchasing processes.

EO **13514** requires agencies to measure, manage, and reduce greenhouse gas emissions toward agency-defined targets. It describes the process by which agency goals will be set and reported to the President and requires agencies to meet a number of energy, water, and waste-reduction targets, including

- 30-percent reduction in vehicle fleet petroleum use by 2020
- 26-percent improvement in water efficiency by 2020
- 50-percent recycling and waste diversion by 2015
- Sustainability requirements met by 95 percent of all applicable contracts by 2010
- Implementation of the 2030 net-zero-energy building requirement
- Implementation of the storm water provisions of the Energy Independence and Security Act of 2007, Section 438
- Development of guidance for sustainable Federal building locations in alignment with the livability principles put forward by the Department of Housing and Urban Development, the Department of Transportation, and the Environmental Protection Agency (EPA).

*NOTE: On October 5, 2009, President Obama signed EO **13514**, which sets sustainability goals for Federal agencies and focuses on making improvements in their environmental, energy, and economic performance. "This Executive Order builds on the momentum of the Recovery Act to help create a clean energy economy and demonstrates the Federal government's commitment, over and above what is already being done, to reducing emissions and saving money." This EO consolidates and strengthens six EOs and establishes updated goals, practices, and reporting requirements for environmental, energy, and*

transportation performance and accountability for the Federal Government: EOs 13423, 13149, 13148, 13134, 13123, and 13101.

4.0 POLICY

It is GRC policy to comply with all applicable regulations regarding green purchasing: selecting and purchasing products to the extent feasible and practical using the EPA's [Comprehensive Procurement Guideline](#) (CPG); purchasing Government-mandated affirmative procurement, environmentally preferable, and biopreferred products; and encouraging life-cycle cost analyses to be used when sustainable design elements are being evaluated for facility projects and all other appropriate projects.

Affirmative procurements are those where products with recycled content are purchased, as identified by the EPA in 40 Code of Federal Regulations (CFR) [247](#), Comprehensive Procurement Guideline for Products Containing Recovered Materials. The term is also identified in NASA Procedural Requirement (NPR) [8530.1A](#), Affirmative Procurement Program and Plan for Environmentally Preferable Products.

Biopreferred procurements follow U.S. Department of Agriculture (USDA) guidelines. Federal programs increase the purchase and use of biopreferred products, which are made from biological or renewable agricultural materials.

In addition, the EPA encourages agencies to consider all internal and external costs associated with a product, process, or activity throughout its entire life cycle—from the acquisition of raw materials to manufacture, recycling, and final disposal.

The amortized annual cost of a product, including capital costs, installation costs, operating costs, maintenance costs, and disposal costs discounted over the lifetime of the product can be identified by conducting a life-cycle cost analysis (Office of Management and Budget (OMB) Circular [A-94](#), Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs). Moreover NASA Policy Directive (NPD) [8820.2C](#), Design and Construction of Facilities, pertains to the life-cycle assessment plan, including the policy for the design and construction of facilities. This policy describes the strategy for incorporating, to the maximum extent possible, industry best practices of sustainable design, maintainable design, building commissioning, and safety and security, into the planning and execution of facility projects. The use of these practices ensures that facility projects are delivered with the most economical life-cycle cost, the least environmental impact, and the maximum benefits to the occupant's health, safety, security, and productivity. The policy also encourages the use of life-cycle cost analyses when sustainable design elements are being evaluated for facility projects. For all appropriate projects, it encourages designers to rate the level of sustainable design by using the Leadership in Energy and Environmental Design (LEED) Green Building Rating System.

NASA shall strive to improve its energy-efficiency and water-conservation practices to save taxpayer dollars, reduce emissions that contribute to air pollution and global climate change, and conserve precious natural resources for future generations. NPR [8570.1](#), Energy Efficiency and Water Conservation, requires each NASA center to develop and maintain an individual energy-efficiency and water-conservation 5-year plan tailored to the needs, resources, and opportunities at that NASA center. Conservation is one of the four principal areas of NASA's environmental strategy. It is the essence of good stewardship for all the resources that NASA controls, and it reduces the impact of Agency activities on the environment.

5.0 RESPONSIBILITIES

NASA regulations require GRC to increase purchases of products containing recovered materials and environmentally preferable products and services. There are two criteria currently used to determine the status of products relative to affirmative procurement standards: recycled-content and biopreferred-content products. Consideration of environmental preferability should begin early in the acquisition process and be rooted in the ethic of pollution prevention, which strives to eliminate or reduce, up front, potential risks to human health and the environment. Therefore, early in the acquisition process, purchasers shall begin to consider environmental preferability. Pollution prevention, the reduction or elimination of waste at the source, cannot only reduce pollution but save money for agencies. Furthermore, pollution-prevention measures can lead to a higher degree of environmental protection by reducing subsequent costs for disposal or cleanup of hazardous wastes and materials. A key reason for environmentally preferable purchasing is to protect the environment by reducing waste and pollution at the source with the resulting benefit of reduced overall cost to the Government. GRC employees and contractors have the responsibilities described in Sections [5.1](#) to **Error! Reference source not found.**

5.1 Glenn Research Center Civil Servants and Support Service Contractors

GRC civil servants and support service contractors shall

- Understand and be knowledgeable about the requirements of EO **13514** and the objectives of NPR **8530.1A**, Affirmative Procurement Program and Plan for Environmentally Preferable Products
- Understand and be knowledgeable about the EPA-designated materials list
- Select EPA-designated materials from the CPG list
- Consult early in the procurement process with appropriate parties (e.g., environmental specialists and contract specialists) to facilitate the process of procurement planning
- Participate in life-cycle cost activities when appropriate

5.2 Glenn Research Center Request Originator

The GRC request originator shall

- Understand and be knowledgeable about the requirements of EO **13514** and the objectives of NPR **8530.1A**
- Understand and be knowledgeable about and select items from the EPA-designated materials list
- Consult early in the procurement process with appropriate parties (e.g., environmental specialists and contract specialists) to facilitate the process of procurement planning
- Review the statement of work (SOW) or specifications with respect to the specific requirements regarding environmental attributes. For support service contracts or major procurements, this review should be accomplished in collaboration with the Energy and Environmental Management Office (EEMO) (also see Procurement Information Circular (PIC) **01-27**).
- If the product or service involves the use of these materials, review and modify (as appropriate) the SOW, specifications, and/or purchase requisition; document this information on NASA Form (NF) **1707** and proceed with the procurement (If the product or service does not involve the use of these materials, document this information on NF **1707** and proceed with the procurement)
- If the product availability suggests that a waiver of the CPG requirements may be appropriate (e.g. cost, availability, or performance), follow the Recycled-Content Waiver Form (NASA **C-138**).
- Participate in life-cycle cost activities when appropriate
- Utilize SOWs or specifications that do not include virgin material requirements but do include reuse of products, use of recovered materials, energy and water efficiency, recyclables, and the use of designated items included in the CPG or other environmentally preferable products or services
- To deviate and procure items not on the mandated CPG list, submit a NASA **C-138** to EEMO for approval on direct purchases over \$10, 000
- Report annually on purchased recycled-content and biopreferred products to EEMO on direct purchases over \$10,000
- Utilize SOWs or specifications that do not include virgin material requirements but do include reuse of products, use of recovered materials, energy and water efficiency, recyclables, and the use of designated items included in the CPG or other environmentally preferable products or services
- Begin the request-for-waiver process by comparing the description of the desired product or service with the current EPA list of EPA-designated products in the **CPG** (If the request originator, after reviewing EPA's list of designated products, and conducting other market research with the assistance of GRC's procurement office, determines that one or more of the exceptions apply, the request originator will prepare a NASA **C-138** and forward it (and supporting documentation) to the environmental manager for approval.)

Certain contracts (e.g., support services) are required by Federal Acquisition Regulation (FAR) clause 52.223-10, Waste Reduction Program, to maintain a waste-reduction program. During the development of the SOW, reporting

requirements, and quality assurance surveillance plan, the proposed work must be evaluated with respect to whether NASA requires insight into the contractor's waste-reduction program. The decision regarding insight should be based on the scope of waste-prevention efforts that is appropriate to the contract size, SOW, and environmental risk. Contractor information delivery requirements should be consistent with GRC's Environmental Management System (EMS) Implementation Plan and FAR Subpart 23.10.

***NOTE:** Consider environmental and energy factors from the beginning of acquisition planning in order to save money, increase efficiency, and reduce pollution in procurements. Actions shall be consistent with the "waste management hierarchy" of reduce, reuse, and recycle, in that order. In July 2009, the NASA FAR Supplement, Procurement Regulations was formally revised to make the requester's completion of an NF 1707 mandatory for the majority of purchase requests processed.*

5.3 Procurement Division

The Procurement Division shall

- Understand and be knowledgeable about the requirements of EO 13514 and the objectives of NPR 8530.1A
- Understand and be knowledgeable about the designated materials list and the request-for-waiver process
- Support efforts to ensure that products and services covered by applicable EPA guidelines are acquired in accordance with requirements from the Resource Conservation and Recovery Act (RCRA), EO 13514, FAR, and NASA
- Require SOWs or specifications that do not include virgin material requirements but that do include the use of recovered materials, reuse of products, life-cycle analysis, energy and water efficiency, recyclables, and the use of EPA-designated items or other environmentally preferable and biopreferred products
- Facilitate procurement planning for annual required reports
- Support and provide guidance and facilitate acquisition planning with respect to environmentally preferable goods and services, including those available through Federal supply sources
- Assist and support in any market research necessary to determine the availability of environmentally preferable goods and services
- Ensure that solicitations and contracts contain the appropriate provisions and FAR clauses to implement affirmative procurement (FAR Part 23)
- Review and revise specifications, product descriptions, standards, and commercial item descriptions during the acquisition planning stage to enhance NASA's procurement of recycled, environmentally preferable, and biopreferred products
- Ensure that contracts, grants, and cooperative agreements include provisions that require documents to be printed double sided on recycled paper, and that the standards established in EPA guidelines are met or exceeded
- Modify existing contracts, in consultation with the NASA technical point of contact, that do not have FAR clauses implementing affirmative procurement when feasible (The implementing clauses are located in FAR Part 23, Subpart 23.4, Use of Recovered Materials.)
- Ensure that the estimation, certification, and verification required of NASA vendors and contractors is consistent with the requirements contained in FAR 52.223--5
- Ensure that checkers working for purchase requisitioners review the applicable purchase request for the attachment of a completed NF 1707. Purchase requests will not be sent to the Procurement Division until a complete NF 1707 is received.

5.4 Contracting Officers and Contracting Officer's Technical Representatives

Contracting officers (COs) and contracting officer's technical representatives (COTRs) shall

- Understand and be knowledgeable about the requirements of EO 13514 and the objectives of NPR 8530.1A

- Understand and be knowledgeable about the EPA-designated materials list and the request-for-waiver process
- Support and provide guidance and facilitate acquisition planning with respect to life-cycle cost analysis and environmentally preferable goods and services. (A life-cycle cost analysis should examine a product's environmental and economic effects throughout its lifetime, including raw material extraction, transportation, manufacturing, use, and disposal.)
- File the original approved NASA [C-138](#) with the appropriate contract
- Support and ensure that solicitations and contracts contain the appropriate provisions and FAR clauses (FAR Part 23, Subpart 23.4) implementing affirmative procurement, including reporting requirements
- Maintain information in the contract file on the contractor's response to FAR clause 52.223-8, Estimation of Percentage of Recovered Materials for Designated Items
- At the end of each fiscal year, collect, compile, and provide all data for recycled-content material that was purchased to EEMO
- Include FAR provision 52.223-4, Recovered Materials Certification, in solicitations that are for, or specify the use of, EPA-designated products containing recovered materials.
- Include FAR clause 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Products, in solicitations and contracts exceeding \$100,000 that are for, or specify the use of, EPA-designated products containing recovered materials.
- Include FAR clause 52.223-10, Waste Reduction Program, in all solicitations and contracts for contractor operation of Government-owned or -leased facilities and all solicitations and contracts for support services at Government-owned or -operated facilities
- Ensure that the contractor submits annual reports, October 1 through September 30, that relate to FAR Part 23, Recovered Materials, Biopreferred Products, and Waste Reduction clauses, and related Glenn Supplemental Requirements (GSRs) to EEMO via the NASA Environmental Tracking System ([NETS](#)) with a copy sent to the CO by November 30 of each year.

***NOTE:** EO [13514](#), builds on and expands the energy reduction and environmental requirements of EO [13423](#) by making reductions of greenhouse gas emissions a priority of the Federal Government, and by requiring agencies to develop sustainability plans focused on cost-effective projects.*

5.5 Facilities Division

The Facilities Division shall

- Understand and be knowledgeable about the requirements of EO [13514](#) and the objectives of NPR [8530.1A](#)
- Understand and be knowledgeable about the EPA-designated materials list and the request-for-waiver process
- Review and amend specifications, as appropriate, to encourage the use of recovered materials
- Comply with NASA-accepted best practices regardless of fund source (e.g., NASA program, institutional investment account, or third party). NPR [8820.2C](#), Design and Construction of Facilities, includes the following:
 - Using life-cycle cost versus first cost to select project systems, equipment, materials, and methods
 - Designing for maintainability to optimize operation and maintenance costs and effort
 - Using environmentally friendly processes, materials, and equipment
 - When a project includes demolition, maximizing reuse versus disposal
 - Ensuring that construction products are procured with recovered content levels as specified in Part C, Construction Products of the Recovered Materials Advisory Notice (RMAN)

- Consulting early in the procurement process with appropriate parties (e.g., environmental specialists, contract specialists) to facilitate the process of procurement planning
- Utilizing SOWs or specifications that do not include virgin material requirements but that do include the reuse of products, use of recovered materials, energy and water efficiency, recyclables, and the use of designated items included in the EPA CPG or other environmentally preferable products or services
- Prepare NASA **C-138** for concurrence signature by EEMO
- At the end of each fiscal year, collect, compile, and provide a list of all recycled-content materials purchased to EEMO
- Ensure that the contractor submits annual reports, October 1 through September 30, that relate to FAR Part 23, Recovered Materials, Biopreferred Products, and Waste Reduction clauses, and related GSRs to SHED via **NETS** with a copy sent to the CO by November 30 of each year.

In carrying out assigned energy-efficiency and water-conservation responsibilities, per NPR **8570.1**, 1.1.2, the following objectives are of special concern to energy managers and facilities maintenance personnel:

- Supporting the minimization of energy and water consumption without affecting safety or mission operations
- Supporting efforts to make employees aware of the importance of limiting energy and water use to the minimum requirements
- Supporting NASA's state-of-the-art research mission by implementing energy efficiency and water conservation measures to
 - Modernize aging facilities and infrastructure using innovative resources
 - Maximize funds allocated to NASA programs and projects through reduced expenditures for energy and utility services
 - Support and demonstrate environmental stewardship

In light of extremely limited appropriations for facility and infrastructure investment, NASA is committed to implementing cost-effective energy-efficiency and water-conservation measures by utilizing innovative funding sources and initiatives, such as the following:

- Supporting partnering with other agencies
- Utilizing Energy Savings Performance Contracts and Utility Energy-Efficiency Service contracts
- Supporting efforts to increase employee awareness, reduce the cost of purchased utilities, and utilize alternate fuels and renewable energy technologies

5.6 Energy and Environmental Management Office, EEMO

EEMO shall

- Understand and be knowledgeable about the requirements of EO **13514** and the objectives of NPR **8530.1A**
- Understand and be knowledgeable about the EPA-designated materials list and the request-for-waiver process
- Advise procurement originators and COs on acquisition strategies for environmentally preferable products and services, including updates to the list of EPA-designated items and biopreferred products
- Review and approve NASA **C-138** waivers
- Compile an annual report on the **NASA Environmental Tracking System**
- Provide support, guidance, and assistance to GRC in interpreting and implementing the EPA and applicable NASA guidelines for recovered materials
- Conduct annual training on updated changes to the program

- Assist in identifying recycled-content or biopreferred products
- Assist with recycled-content and biopreferred language for SOWs

6.0 REQUIREMENTS

GRC is required to procure products with recycled-content materials, biopreferred products (made from biological or renewable agricultural materials), and other environmentally preferable materials. Federal programs increase the purchase and use of these materials, reducing waste and pollution. In addition, GRC is required to report its green purchasing activities every year.

6.1 Environmental Attributes

- EPA's CPG and [recommendations concerning the list of designated products](#)
- [Environmentally preferable products or services](#)
- USDA [guidelines and recommendations concerning USDA's list](#) of designated products under the Food, Conservation, and Energy Act of 2008 (2008 Farm Bill)

NOTE: In certain circumstances, specific requirements regarding environmental attributes may conflict practically (e.g., in choosing between a recycled-content product and an ENERGY STAR product). In these circumstances, EEMO may prioritize or weight the evaluation factors in regards to the conflicting requirements, and shall coordinate the weighted evaluation factors with the CO.

6.2 Direct Procurement

The affirmative procurement program requires that all direct purchases of CPG-listed products by NASA civil servants contain recovered materials ([FAR 23.404 b](#)) unless a waiver ([NASA C-138](#)) is prepared and distributed in accordance with NASA Policy Guideline (NPG) 8830. (Unless a waiver has been obtained, the CO shall ensure that the clauses at 52.223-4, Recovered Material Certification, and 52.233-9, Estimate of Recovered Material Content for EPA-Designated Products, are in all contracts for the direct procurement of items on the CPG list.)

6.3 Support Services Contracts

Section 23.705 of the FAR requires COs to include the clauses at 52.223-10, Waste Reduction Program, when the contract is for the operation of Government-owned or -leased facilities or for support services at Government-owned or -leased facilities. Among other things, the clause at 52.223-10 requires that prime contractors determine when EPA-designated items are used in the performance of a contract. The CO must also include clauses 52.223-4 and 52.223-9 when clause 52.223-10 is included in a contract.

6.4 Other Contracts

Contractors may be required to purchase items on the CPG by an explicit requirement contained in specifications, standards, or SOWs. Section 11.101 b of the FAR states that agencies should prepare product descriptions to achieve the maximum practicable use of recovered materials, of other materials that are environmentally preferable, and of products that are energy efficient.

6.5 Life-Cycle Cost Analysis

The Office of Federal Procurement Policy Letter 92-4 requires Federal agencies to use life-cycle cost analysis, wherever feasible and appropriate, to assist in selecting products and services. Whenever possible, the cost shall be calculated over the life of the item, not just the initial, upfront cost. When alternative products are being compared, the initial cost of the acquisition, as well as the lifetime maintenance costs, operational costs, and other costs, must be considered in the analysis. A product having a higher initial cost may have a lower operational cost or a higher resale value and will, therefore, prove to be a better value and more cost effective in comparison to the alternatives. See Appendix C for details.

6.6 Chemical Purchasing

Only an approved list of personnel are allowed to purchase chemicals and hazardous materials. These GRC-approved personnel are responsible for keeping track of purchased chemicals and hazardous materials that are ordered and brought onto into the Center. Chemicals or hazardous materials cannot be purchased with the Government-furnished credit card. Please contact the Chemical Purchasing Office to place orders and for further

guidance at 3-8689. EEMO reviews for release all purchase requests for hazardous chemicals and evaluates the hazard potential of each hazardous chemical being purchased. Note that a waiver, in lieu of a life-cycle assessment (LCA), may be requested from the chapter lead. Please refer to Chapter 15 of the Environmental Programs Manual for further guidance.

Chapter 19 establishes policies and procedures pertaining to the procurement, use, handling, disposal, and overall management of ozone-depleting substances (ODSs), products made from or containing ODSs, and ODS substitutes (see FAR 52.223.10, Waste Reduction Program, FAR 52.223-11, Ozone-Depleting Substances, and FAR 52.223-12, Refrigeration Equipment and Air Conditioners). Any purchase of ODSs and products made from or containing ODS materials must comply with the requirements of 48 CFR Part 1, 40 CFR Part 82, and EO 13423.

NOTE: All such materials must be reported, tagged, and tracked. Items that require a deposit or have a rental charge associated with them (e.g., cylinders, dewars, etc.) must be purchased by the Chemical Purchasing Office for accountability purposes.

6.7 Purchasing Categories

6.7.1 Acquisition Planning

The buy-recycled requirements shall be considered during the acquisition planning stage if non-Federal supply sources are used. EO 13423 and FAR Part 7 provide that, in developing plans, drawings, work statements, specifications, or other product descriptions, GRC shall consider a broad range of factors including the elimination of virgin material requirements, the use of biopreferred products, the use of recovered materials, reuse of product, life-cycle cost, recyclables, the use of environmentally preferable products, waste prevention (including toxicity reduction or elimination), and ultimate disposal, as appropriate. These factors should be considered in acquisition planning for all procurements and in the evaluation and award of contracts (i.e., the bidder most able to cost-effectively satisfy the recovered-material-content specifications as well as the performance/design specifications outlined in the procurement solicitation). A life-cycle analysis is encouraged during this early planning stage.

6.7.2 Simplified Acquisition

The buy-recycled requirements apply when EPA-designated products are purchased or supplied for use in a contract. FAR requires agency CO's to insert the clause at 52.211-5, Material Requirements, in all solicitations and contracts for supplies that are not commercial items. FAR also requires COs to insert the clause at 52.223-10, Waste Reduction.

6.7.3 Specification Review and Revision

Program offices are responsible for reviewing and revising specifications, product descriptions, and standards during the acquisition planning stage to enhance GRC's procurement of recycled-content products.

6.7.4 Revising Standards To Remove Barriers to Green Purchasing

Standards or specifications unrelated to performance or presenting barriers to procuring recycled-content products should be revised or eliminated when procurement specifications are being reviewed or drafted. When GRC's specifications are being revised, requirements for virgin materials shall be eliminated, preference for recovered materials to the maximum extent practicable shall be added, and the purchase of products containing recovered material shall be allowed.

6.7.5 Micropurchases

Micropurchases are credit card purchases below the \$3,000 threshold. The requirement to purchase recycled-content CPG items applies to all purchases, including those at or below the micropurchase threshold. EO 13423 requires purchasers making micropurchases to first consider purchasing recycled-content products.

NOTES: Micropurchases are not subject to waiver documentation requirements, but must meet the specific requirements regarding environmental attributes. Direct procurement of EPA-designated CPG materials that do not meet the minimum recovered-material standards require a waiver approved by the official designate.

6.7.6 Federal Supply Sources

Established Federal supply sources, such as the General Services Administration (GSA), Government Printing Office, Javits-Wagner-O' Day Program, the Defense General Supply Center, and UNICOR are competitive sources for EPA-designated items and other recycled-content products. Procuring recycled-content products through these sources offers the following advantages:

- The products have been bid competitively.
- The products meet or exceed EPA minimum-content standards for recovered materials.
- Electronic catalogs identify CPG-compliant products.

6.8 Request-for-Waiver Process

The request-for-waiver process begins with the request originator comparing the description of the desired product or service with the current EPA [list of designated products](#).

1. If after reviewing EPA's designated products and conducting other market research with the assistance of the Procurement Division, the request originator determines that one or more of the exceptions apply, the request originator will prepare a NASA [C-138](#) (see the sample in Appendix [D](#)) and forward it and supporting documentation to the EEMO for approval.
2. When cost is the basis of the waiver justification, the NASA [C-138](#) shall include documented consideration of the life-cycle cost analysis for the use of the product, as well as the initial cost.
3. When approved, a copy of the signed NASA [C-138](#) is kept by EEMO, and the original NASA [C-138](#), along with the NF [1707](#) and other necessary purchase documentation, is forwarded to the Procurement Office.
4. If the request for waiver is not approved, the request originator shall revise the request to include the EPA minimum-recovered materials standard for that item.
5. Unresolved disputes regarding waivers shall be referred to the NASA environmental executive.
6. Purchase requests and/or requisitions that are forwarded to the Procurement Division with an incomplete NF [1707](#) (with respect to the "Affirmative Procurement" section) will not be finalized until a completed NF [1707](#) is received.
7. According to RCRA section 6002(c) and EO [13423](#), Sections 402(c) and 502(c), agency decisions to not buy recycled-content products must be justified in writing. RCRA provides four justifications:
 - a. The product is not available competitively.
 - b. The product is not available within a reasonable time frame, 48 hours.
 - c. The product does not meet reasonable performance standards.
 - d. The product is only available at an unreasonable price, 10 percent or more higher than non-recycled-content products.

6.9 Environmental Reporting

1. This resource is a supporting component in compliance with Section 9002 of the Farm Security and Rural Investment Act of 2002. It directs the USDA to develop and implement a comprehensive preferred procurement program for the Federal Government.
2. The law requires Federal agencies to give procurement preference to USDA-designated biopreferred products and to develop affirmative procurement programs for purchasing them and establishing tracking and reporting systems (i.e., USDA Awareness Training for the BiopreferredSM Program Biobased Products Best Practices Guide)
3. Some required data or information pertains to procurement or contract management activities and responsibility is shared by EEMO and the Procurement Division to ensure that the data and information reported are accurate. All environmental reports to NASA Headquarters that pertain to contracts, procurement, or acquisition will be coordinated with the procurement officer before submission.

4. The request originator and/or the CO, as appropriate, shall document the decision not to buy recycled-content products. The original copy of the documentation becomes part of the original contract file.
5. The request originator is responsible for submitting a copy of NF 1707 to the responsible program manager.
6. GRC's program manager is responsible for forwarding a copy of all NASA C-138 waivers to EEMO within 30 days for annual reporting purposes in NETS.

NOTE: These requirements are not in conflict with mandatory source procurement provisions. Once the specifications (including specific requirements regarding environmental attributes) are finalized, mandatory sources are considered to determine if procurement proceeds to commercial sources, as per procurement guidelines and regulations.

6.10 VERIFICATION APPROACH

EEMO takes several proactive steps to verify that GRC employees and contractors are complying with requirements for green product purchasing (including green chemicals), life-cycle assessments, justification waivers (NASA C-138s), direct purchasing for contracts over \$100,000, waste reduction, acquisition planning, and environmental reporting.

6.10.1 Awareness Presentations and Training

EEMO provides awareness presentations and training about green procurement to contracting officers, contracting officer's technical representatives, program managers, requisitioners, and bankcard holders.

6.10.2 Review of Statements of Work, Contracts, Contract Files, and Reports

EEMO examines statements of work (SOWs) and contracts for support services, facility design, and other services and products to ensure that green purchasing FAR requirements are included (NF 1634). Contract files (in the Procurement Division), System for Administration, Training, and Educational Resources for NASA (SATERN) attendance sheets, forms, and awareness training requests are reviewed to ensure that attendance at training and awareness sessions and purchases of green products (including green chemical alternatives) have been documented. Contract files are reviewed to make sure that market research, NASA C-138 waivers, and NF 1707s have been filed.

In addition, P-card purchases are reviewed periodically, C-138s are reviewed and approved, and contracts over \$100,000 are examined for direct mandated purchasing to comply with FAR 52.020.223 and 52.229. Monthly waste disposal reports and contractor life-cycle assessments and waste-reduction plans are also reviewed (FAR 52.229, 229, and Part 7).

6.10.3 Promotion of Alternative Materials

Alternative materials, especially green chemicals and USDA alternatives, are identified for requisitions when available. To encourage the use of alternative materials, EEMO reviews products, services, and market research documents and recommends alternative materials for safety permit reviews.

6.10.4 Reports

EEMO collects green purchasing data from contractors and compiles and submits green activities in NETS reports and annual RCRA reports (FAR 52.202, 52.223, 52.223.10, and 52.229).

7.0 RECORDS

Life-cycle assessment analysis.—Maintained by CO, with copy sent to EEMO's Affirmative Procurement Office.

NASA C-138, Recycled Content Waiver Form.—Original approved forms maintained by the appropriate contracts; copies maintained by EEMO.

Annual training attendance sheets.—Maintained by the training office.

NF 1707, Special Approvals and Affirmations of Requisitions.—Original approved forms maintained by the appropriate contracts; copies maintained by EEMO.

NASA NF 1634, Contracting Officer Technical Representative (COTR)/Alternate COTR Delegation.—Original approved forms maintained by the appropriate contracts; copies maintained by EEMO.

8.0 REFERENCES

Document number	Document name
EO 13514	Federal Leadership in Environmental, Energy, and Economic Performance— This Executive Order sets sustainability goals for Federal agencies and focuses on making improvements in their environmental, energy, and economic performance.
NPR 8530.1A	Affirmative Procurement Requirements for Environmentally Preferable Products
NPR 8820.C	Design and Construction of Facilities
NPR 8570.1	Energy Efficiency and Water Conservation
RMAN	Recovered Materials Advisory Notice
40 CFR 247	U.S. EPA, Comprehensive Procurement Guideline for Products Containing Recovered Materials
RCRA	Resource Conservation Recovery Act
40 CFR	Protection of the Environment
GLM-QS-8500.1A	GRC EEMO, Environmental Programs Manual
FAR 52	Use of Recovered Materials

APPENDIX A.—DEFINITIONS AND ACRONYMS

Affirmative procurement products.—Those commercial or industrial products (other than food or feed) that are manufactured from recycled and reclaimed materials (EO 13423) and/or biopreferred products.

Biopreferred products.—Commercial or industrial products (other than food or feed) that utilize biological products or renewable domestic agricultural plant, animal, marine, or forestry materials; (EO 13423); see U.S. Department of Agriculture’s [list of biopreferred products](#).

Building for Environmental and Economic Sustainability (BEES)

Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs Within NPR 8820.2F.—Discrete construction of facilities projects must have a life-cycle cost analysis and a draft budget narrative (see the [NASA Business Case Guide For Facilities Projects](#)).

Code of Federal Regulations (CFR), Title 40, Protection of Environment.—The Code of Federal Regulations is a publication established by Act of Congress (44 U.S.C. § 1510). It represents a compilation of all the regulations issued by Federal administrative agencies that have “general applicability and legal effect.” Title 40 of the CFR covers a wide range of subjects that apply to recycling affirmative procurement.

10 Code of Federal Regulations (CFR) 434, Energy Code for New Federal Commercial and Multi-Family High Rise Residential Buildings.—This regulation establishes energy conservation performance standards that are mandatory for the design of Federal buildings (see Circular A-94).

14 Code of Federal Regulations (CFR) 1216, Environmental Quality.—This regulation requires an environmental analysis for each project and an environmental assessment for each discrete project unless the action is one normally requiring an environmental impact statement or the action is categorically excluded.

Conservation.—Conservation of water, energy and other resources are a concern as they relate to the product and the product’s use. Consideration should be given to a product’s life cycle at NASA and at the vendor.

Contracting officer (CO)

Contracting officer’s technical representative (COTR)

Environmental Management Branch (EMB) at Glenn Research Center

Energy use reduction.—The most desirable products in this category would have the greatest reduction in energy usage at Glenn Research Center.

Environmental Management Branch (EMB)

Environmental Management System (EMS)

Environmental Protection Agency (EPA)

Executive Order (EO) 13423.—This EO strengthens goals from “Greening the Government” executive orders, including requiring the preparation of a written pollution prevention plan and the development of goals to reduce the use and release of toxic chemicals; improve energy efficiency; reduce greenhouse gases, energy consumption, water consumption, and the use of petroleum products; expand environmental purchasing; and promote pollution prevention, renewable energy projects, and environmental management systems.

Federal Acquisition Regulation (FAR)

Glenn Procedural Requirement (GLPR)

Glenn Research Center (GRC)

Glenn Supplemental Requirement (GSR)

Hazardous waste minimization.—Hazardous waste is defined by the Resource Conservation and Recovery Act. The most desirable products in this category would have the greatest potential for minimizing hazardous waste generation at Glenn Research Center. Consideration should be given to treatment, onsite disposal, and offsite transfers.

Leadership in Energy and Environmental Design (LEED)

Life-cycle assessment (LCA).—This assessment involves the comprehensive examination of a product’s environmental and economic aspects and potential impacts throughout its lifetime, including raw material extraction, transportation, manufacturing, use, and disposal (EO 13514). The International Standards Organization has a slightly different definition of the life-cycle assessment: —Compilation and evaluation of the inputs, outputs, and the potential environmental impacts of a product system throughout its life cycle.” In this chapter, the term implies that both definitions must be satisfied.

Life-cycle cost effective.—The life-cycle cost of a product, project, or measure that has been estimated to be equal to or less than the current or standard practice or product.

NASA Environmental Tracking System (NETS)

NASA Form (NF) 1509, Facility Project-Brief Project Document, and NF 1510, Facility Project Cost Estimate.—These forms are required for all construction of facilities (CoF) projects requested for inclusion in the budget year. Discrete CoF projects also must have a life-cycle cost analysis and a draft budget narrative (see http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/Case_Guide_4-20-06.pdf).

NASA Policy Guideline (NPG)

NASA Policy Directive (NPD) 8820.2C, Design and Construction of Facilities.—This policy directive stipulates that new property shall be purchased, constructed, and/or operated only when existing capabilities (including those owned by NASA and other external entities) cannot be used or modified cost effectively. In addition, industry-best practices of sustainable design, maintainable design, building commissioning, and safety and security shall be incorporated, to the maximum extent possible, into the planning and execution of facility projects.

NASA Procedural Requirements (NPR) 8530.1A, Affirmative Procurement Program and Plan for Environmentally Preferable Products.—This procedural requirement is for acquiring Environmental Protection Agency (EPA)-designated products required by the Resource Conservation and Recovery Act of 1976 (42 U.S. Code (U.S.C.) 6962) and EO 13423 of January 24, 2007, Strengthening Federal Environmental, Energy, and Transportation Management.

Office of Management and Budget (OMB)

Ozone-depleting substance (ODS)

Procurement Information Circular (PIC)

Recycling and/or beneficial reuse potential.—Recyclable products can be collected and remanufactured into new products after they have been used. These products do not necessarily contain recycled materials and only benefit the environment if people recycle them after use.

Recovered Materials Advisory Notice (RMAN).—This notice is linked to affirmative procurement by showing the designated percentages of Comprehensive Procurement Guideline III Items. These CPG products can be found through the U.S. General Services Administration and the Defense Logistics Agency.

Resource Conservation and Recovery Act (RCRA)

Resource use reduction.—The most desirable products in this category would have the greatest reduction in usage of other resources at GRC. Reduction of nonrenewable resources, including petroleum solvents, should be rated higher than reduction of renewable resources. Emphasis should also be placed on eliminating animal-derived or virgin forest products.

Preference should be given to products that do not contain unnecessary components, such as fragrances or dyes.

NOTE: This category applies to environmental emissions, health benefits, and safety benefits. The focus is on within-facility everyday standard use (versus accidental); that is, expected emissions, health problems, and safety problems, for any exposure route (air, water, soil, or skin contact). Consideration should be given to a product’s life cycle at NASA and at the vendor.

Energy and Environmental Management Office (EEMO)

Solid-waste minimization.—The most desirable products in this category would have the greatest potential for minimizing solid-waste generation at GRC. The idea is to reduce the use of landfill space and the need for more

landfill area. Packaging—a large component of solid-waste generation—can be reduced if more concentrated products are purchased.

Statement of work (SOW)

Sustainable design (SD).—This overarching concept incorporates appropriate sustainable design elements into facilities planning, design, construction, operation, and maintenance that enhance and balance facility life-cycle cost, environmental impact, and occupant health, safety, security, and productivity. The essential elements of NPD **8820.2C**, Design and Construction of Facilities, include

- Energy efficiency and water conservation
- Site selection to minimize environmental and transportation impact and, if possible, to enhance the environment
- Use of sustainable materials (reused, recycled, recyclable, nontoxic, low embodied energy content, and renewable)
- Emphasis on durability and efficiency of materials and equipment
- A healthy environment not limited to healthy indoor air quality
- Features that support of enhanced worker productivity
- Design for personnel safety and security
- Design for decommissioning and disposal
- Enhanced building operating and maintenance characteristics
- A philosophy that defines operational objectives, then tests and verifies that all building systems and components have been properly installed and perform to the level intended

System for Administration, Training, and Educational Resources for NASA (SATERN)

U.S. Code (U.S.C.)

U.S. Department of Agriculture (USDA)

Waste Reduction Model (WARM)

Water use reduction.—The most desirable products in this category would have the greatest reduction in water usage at GRC.

APPENDIX B.—REFERENCE TOOLS

B.1 Training Tools

- Green Purchasing training course, System for Administration, Training, and Educational Resources for NASA (SATERN)
- [Environmentally preferable purchasing tools](#).—This resource developed by the Environmental Protection Agency (EPA) can help Federal purchasers put environmentally preferable purchasing into practice.
- Affirmative procurement environmentally preferable product lists.—These can be viewed on EPA’s site under CPG listings.
- [Biopreferred product lists](#).—These can be viewed on the on USDA’s site under BioPreferred listings.
- Life Cycle Analysis training course, System for Administration, Training, and Educational Resources for NASA (SATERN)

B.2 Optional Calculators and Tools

- [Building for Environmental and Economic Sustainability \(BEES\)](#).—This software is a technique for selecting cost-effective, environmentally preferable building products. In support of the 2002 Farm Security and Rural Investment Act (Public Law (PL) 107–171), BEES was adapted to include biopreferred products.
- [Electronics Environmental Benefits Calculator](#).—This calculator is intended to assist institutional purchasers, including Federal Electronic Challenge program participants, in quantifying the benefits of environmentally sound management of electronic equipment.
- [Calculating the Benefits of Purchasing, Reusing, & Recycling Computers](#)
- [The Green Matrix](#).—This software is designed to cross-reference topics of sustainability with the standard phases of project design, thereby offering appropriate strategies for a particular phase of work.
- [Building Materials Reuse Calculator](#).—This calculator helps to estimate the environmental benefits of salvaging and reusing building materials, rather than buying and installing new ones. It also calculates potential construction-waste reduction.
- [ENERGY STAR Quantity Quotes](#).—This Web site links institutional and corporate purchasers to ENERGY STAR partners offering bulk procurement arrangements. You can register as a supplier or purchaser.
- [Green Chemicals Alternatives Purchasing Wizard](#).—This tool helps users to reduce the hazardous waste profile in research labs.
- [Waste Reduction Model \(WARM\)](#).—The EPA created WARM to help solid-waste planners and organizations track and voluntarily report reductions of greenhouse gas emissions from several different waste management practices. This is a good tool for quantifying environmental activities from a macrolevel perspective.

B.3 Leadership in Energy and Environmental Design Reference Tools

- [Building Green](#)
- [Construction Initiative](#).—The EPA’s Construction Initiative is a collaborative, public-private sector effort to increase the recycling and reuse of industrial materials in building and transportation construction projects across the Nation. It is a part of the EPA’s Resource Conservation Challenge, a national program that provides renewed urgency to the EPA’s message of reducing, reusing, and recycling valuable materials (NPR [8530.1A](#)).
- [Greenbuild365](#).—Greenbuild365 provides a learning portal for green building education.
- [High Performance Buildings](#).—This Web site links to and provides highlights from the U.S. Green Building Council, the Leadership in Energy and Environmental Design (LEED) Green Building Rating

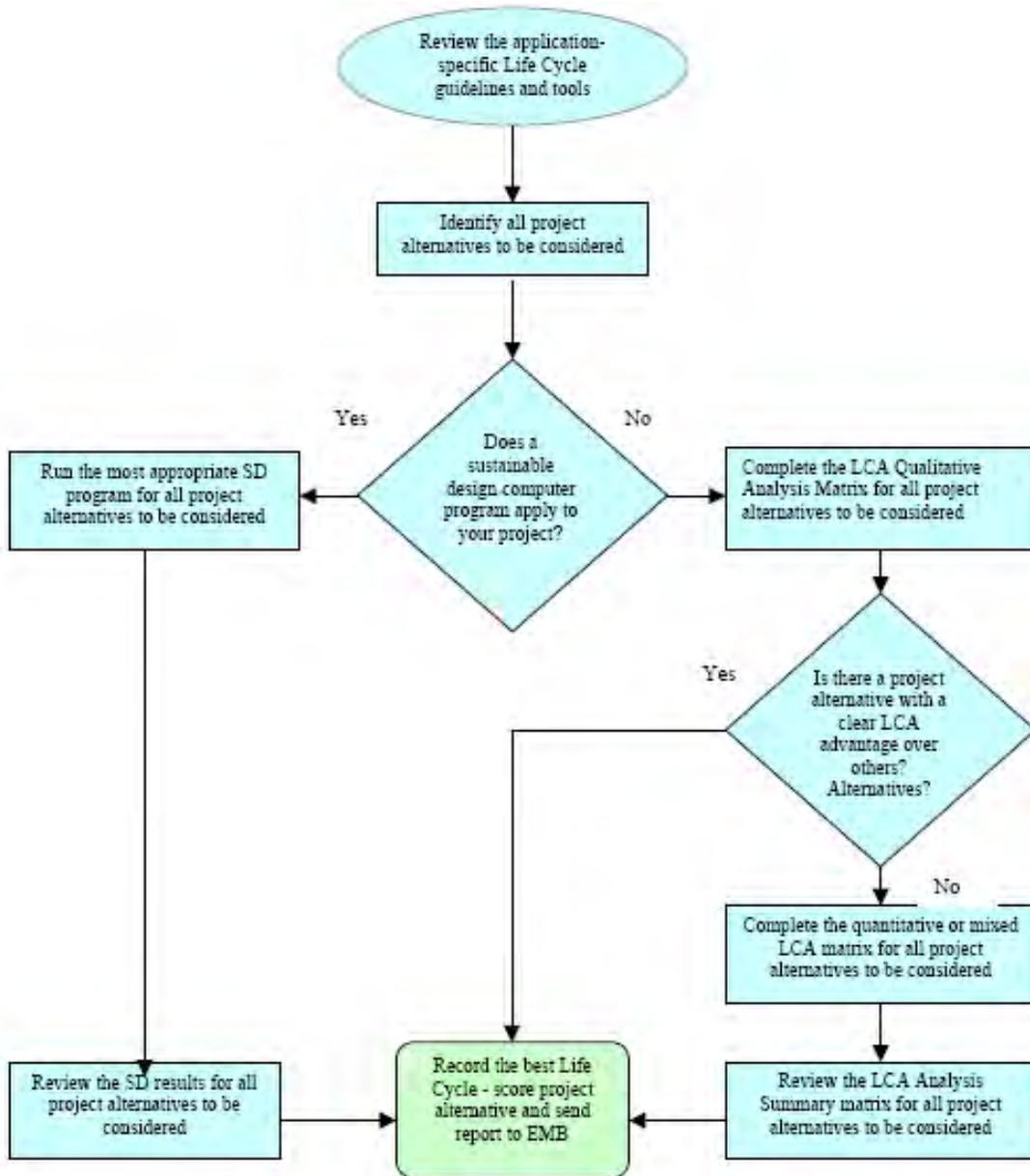
System, case studies of green construction efforts, software and databases to aid in determining which construction products and processes are the most effective, and assorted high-performance construction guidelines and standards.

- **Sustainable Sites**.—This cooperative effort, which was intended to supplement existing green building and landscape guidelines, is becoming a standalone tool for site sustainability.

With regards to the construction and/or renovation of buildings and structures, a number of potentially useful computer programs have been screened for use at GRC as part of the conceptual design and/or materials selection process. The use of such programs would need to be incorporated into the current construction project process. The computer programs that have been screened thus far, and that may serve their stated purposes at GRC, include

- Federal Methodology for Life-Cycle Cost Analysis (10 CFR **436**).—This clearly has applications for evaluating life-cycle cost analyses of energy and water conservation. Additional applications need further evaluation.
- **ATHENA Impact Estimator** (from the ATHENA Sustainable Materials Institute).—This software allows conceptual building designs to be compared in a more broad-based life-cycle framework and has implications for the selection of building materials.
- **BEES**.—This software implements a systemic evaluation of environmental and economic factors for the selection of building products. It meets the ASTM International standard for life-cycle cost method.
- **Building Life-Cycle Cost (BLCC)**.—This software provides computational support for the analysis of capital investments in buildings.
- **DISCOUNT**.—This software computes discount factors and related present values, future values, and financial parameters.
- **EMISS**.—This program is designed to estimate air pollution emission factors related to energy use in buildings.
- **ERATES** (electricity rates).—This software calculates the monthly and annual electricity costs for a facility, building, or system.
- **Energy Plus**.—This new-generation building-energy simulation program is designed for modeling buildings and the associated heating, cooling, lighting, ventilation, and other energy flows.
- **SpecIntact** (Specifications-Kept-Intact).—This automated system for preparing standardized facility construction specifications is used worldwide by NASA, the U.S. Naval Facilities Engineering Command, and the U.S. Army Corps of Engineers.
- **LCA** (Life Cycle Analysis).—This is a life-cycle assessment matrix for considering alternative products.

APPENDIX C.—LIFE-CYCLE PROCEDURES FOR PROJECT EVALUATORS



APPENDIX D.—RECYCLED-CONTENT WAIVER FORM

http://forms.grc.nasa.gov/Forms/PublicUser/index.cfm?fuseaction=SEARCH.searchDetails&form_id=50

This form is used for requests for materials specified in the Environmental Protection Agency's regulation 40 CFR 247, Comprehensive Procurement Guideline for Products Containing Recovered Materials and as required in Executive Order **13514** that do not meet the recycled specification.

Requestor's Name: _____ Date: _____ Location: _____ Phone: _____

Material Requested: _____ Supplier: _____

(See Comprehensive Procurement Guidelines CPG—<http://www.epa.gov/epawaste/conserve/tools/cpg/index.htm>)

Check all that apply:

Not available competitively within a reasonable time frame 48 hr

Does not meet appropriate performance standard

Price unreasonable 10%

Supporting information (must be completed): _____

Originator: _____ Date: _____

Signature of requester: _____ Date: _____

_____ Date: _____

Affirmative Procurement Lead

Michelle Y. Kenzig

_____ Date: _____

Energy and Environmental Management Office

Please send completed form to the Energy and Environmental Management Office 21-6.

NASA C-138 (Rev. 11-2008)

SECTION 4 — TECHNICAL APPROVAL (The following affirmations are to be made by the Program or Project Technical Authority(ies))
<input type="checkbox"/> THIS PROCUREMENT IS NOT FOR SPACE FLIGHT AND GROUND SUPPORT PROGRAMS. OR <input type="checkbox"/> THIS PROCUREMENT IS FOR SPACE FLIGHT AND GROUND SUPPORT PROGRAMS AND PROJECTS AND TECHNICAL STANDARDS AND SPECIFICATIONS CITED IN THE SOLICITATION/AWARD ARE: <input type="checkbox"/> 1) THE MOST RECENT VERSION, 2) TAILORED TO THE NEEDS OF THE PROJECT AND ITS ELEMENTS, AND 3) REGISTERED WITH THE NASA STANDARDS UPDATE NOTIFICATION SYSTEM (SUNS) AT < http://standards.nasa.gov/default.taf >. OR <input type="checkbox"/> EXCEPTIONS HAVE BEEN APPROVED BY THE TECHNICAL AUTHORITIES, AND ARE ATTACHED HERETO. (See NPR 7120.5D paragraph 3.4, < http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PR_7120_005D_&page_name=Chapter3 >) <input type="checkbox"/> THIS PROCUREMENT HAS NO REQUIREMENTS RELATED TO SPACE COMMUNICATION AND NAVIGATION (SCAN) CAPABILITIES OF NASA, OR OTHER US GOVERNMENT AGENCIES, OR OF OTHER NATIONS OR <input type="checkbox"/> THIS PROCUREMENT HAS REQUIREMENTS RELATED TO SPACE COMMUNICATION AND NAVIGATION CAPABILITIES OF NASA, OF OTHER US GOVERNMENT AGENCIES, OR OF OTHER NATIONS, AND THE REQUISITION HAS BEEN COORDINATED WITH THE OFFICE OF SPACE COMMUNICATION AND NAVIGATION (SCAN) IN THE OFFICE OF SPACE OPERATIONS MISSION DIRECTORATE (SOMD) (See NPD 8074, "Management and Utilization of NASA's Space Communication and Navigation Infrastructure")
SECTION 5 — QUALITY ASSURANCE
<input type="checkbox"/> THIS PROCUREMENT IS NOT SUBJECT TO HIGHER-LEVEL QUALITY REQUIREMENTS. OR <input type="checkbox"/> THIS PROCUREMENT IS SUBJECT TO HIGHER-LEVEL QUALITY REQUIREMENTS. (See NPD 8730.5, Attachment A at: < http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PD_8730_0005_&page_name=main&search_term=quality >) "Critical and Complex", Subject to AS9100.
SECTION 6 — SAFETY
<input type="checkbox"/> THIS PROCUREMENT DOES NOT ACQUIRE ANY HAZARDOUS MATERIALS NOR ARE HAZARDOUS MATERIALS USED IN PRODUCTION OR PERFORMANCE OF SERVICE UNDER THIS PROCUREMENT OR <input type="checkbox"/> THIS PROCUREMENT IS FOR, OR PERFORMANCE REQUIRES THE USE OF, ANY OF THE FOLLOWING: -EXPLOSIVES OR PYROTECHNICS -RADIOACTIVE MATERIALS AND EQUIPMENT WHICH MAY EMIT IONIZING RADON -CONTROLLED SUBSTANCES AND PRESCRIPTION DRUGS -EQUIPMENT THAT EMITS AIR CONTAMINANTS OR WASTE WATER DISCHARGE -AIR POLLUTANTS (E.G. REGULATED GASES, VOLATILE SOLVENTS, PAINTS AND COATINGS WITH VOC)
SECTION 7 — CAPITAL EQUIPMENT
<input type="checkbox"/> THIS PROCUREMENT WILL NOT INVOLVE THE PURCHASE OR FABRICATION OF PROPERTY WITH UNIT VALUE > \$100,000, TO WHICH THE GOVERNMENT WILL TAKE TITLE. OR <input type="checkbox"/> THIS PROCUREMENT WILL INVOLVE THE PURCHASE OR FABRICATION OF PROPERTY > \$100,000 PER ITEM, EITHER AS A LINE ITEM DELIVERABLE OR AS CONTRACTOR-ACQUIRED PROPERTY TO WHICH THE GOVERNMENT WILL RECEIVE TITLE. NASA Form 1739, "ALTERNATIVE FUTURE USE QUESTIONNAIRE - NASA PROJECTS," IS ATTACHED.
SECTION 8 — REQUIRED SPECIAL APPROVALS, CENTER SPECIFIC SUPPLEMENTS (e.g., NASA C-8095)
<input type="checkbox"/> THERE ARE NO ITEMS REQUIRING SPECIAL APPROVAL. OR <input type="checkbox"/> APPROVALS FOR SPECIAL ITEMS HAVE BEEN OBTAINED THROUGH THE ESTABLISHED SAP RELEASE STRATEGY. OR <input type="checkbox"/> APPROVALS FOR SPECIAL ITEMS ARE ATTACHED.

APPENDIX E.—APPLICABILITY OF FEDERAL ACQUISITION REGULATION (FAR) PART 23 RECOVERED MATERIALS, BIOBASED PRODUCTS, AND WASTE-REDUCTION CLAUSES, AND RELATED GLENN SUPPLEMENTAL REQUIREMENTS

If a statements of work (SOW) describes a requirement that is under \$100K and is either for, or specifies the use of, Environmental Protection Agency- (EPA-) designated products containing recovered materials, any resultant solicitation must include Federal Acquisition Regulations (FAR) provision 52.223-4, Recovered Material Certification.

If an SOW describes a requirement that is over \$100K and is either for, or specifies the use of, EPA-designated products containing recovered materials, any resultant solicitation and contract must include the following:

1. FAR provision 52.223-4, Recovered Material Certification
2. FAR clause 52.223-9, Estimate of Percentage of Recovered Material content for EPA-Designated Products (with Alt. I if the technical personnel advise that estimates can be verified)
3. Applicability of FAR Part 23 Recovered Materials, Biobased Products, and Waste Reduction Clauses, and related Glenn Supplemental Requirements (GSRs)

E.1 Recovered Material Reporting

Each contractor shall submit a report estimating the percentage of the total recovered material used in the contract performance, including, if applicable, the percentage of postconsumer material content. The reporting period shall be from October 1 of each year through September 30 of the following year. The report shall be submitted by December 31. This report shall be submitted to the address listed at [NETS](#). The report will be provided to the contracting officer and the NASA Glenn Research Center (GRC) Environmental Management Branch (EMB). A complete listing of all categories and products that the EPA has designated as having to meet recycled or reclaimed percentages is provided on their [CPG products Web site](#).

If an SOW describes a requirement that is for (1) support services at Government-owned or -leased facilities or (2) contractor operation of Government-owned or -leases facilities, any resultant solicitation and contract must include the following:

1. FAR clause 52.223-10, Waste Reduction Program
2. Applicability of FAR Part 23 Recovered Materials, Biobased Products, and Waste Reduction Clauses, and related GSRs

E.2 Waste-Reduction Reporting

The contractor shall submit a report for all operations and facilities covered by this contract about its program to promote and implement cost-effective waste-reduction and affirmative procurement programs required by 42 U.S. Code (U.S.C.) 6962 for all products designated in EPA's 40 Code of Federal Regulations (CFR) [247](#), Comprehensive Procurement Guideline for Products Containing Recovered Materials. Both FAR 23.404(b) and NASA Policy Guideline (NPG) 8830.01 require that Government purchases of EPA-designated items contain the specified amount of recovered materials unless a request for waiver (NASA [C-138](#)) or justification documentation has been processed. The reporting period shall be from October 1 of each year through September 30 of the following year. The report shall be submitted in time to be received by December 15. This report shall be submitted at the address listed at [NETS](#). The report will be provided to the contracting officer (CO) and GRC's EMB. The contractor's programs shall comply with applicable Federal, State, and local requirements, NASA environmental policy, and the GRC Environmental Program Manual, specifically including Section 6002 of the Resource Conservation and Recovery Act (42 U.S.C. 6962, et seq.) and implementing regulations (40 CFR [247](#)). A complete listing of all categories and products designated in EPA's 40 CFR [247](#) can be found at their [CPG products Web site](#).

If a SOW describes a requirement that either requires the delivery or specifies the use of, USDA-designated biobased items, any resultant solicitation must include FAR provision 52.223-1, Biobased Product Certification.

If a SOW describes a service or construction requirement that either involves, or may involve, the use of USDA-designated biobased items, any resultant solicitation and contract must include the following:

1. FAR provision 52.223-1, Biobased (Biopreferred) Product Certification

2. FAR clause 52.223-2, Affirmative Procurement of Biobased Products Under Service and Construction Contracts
3. Applicability of FAR Part 23 Recovered Materials, Biobased Products, and Waste Reduction Clauses, and related GSRs

The contractor shall submit a report for all operations and facilities covered by this contract about its program to promote and implement cost-effective waste-reduction and affirmative procurement programs required by 42 U.S.C. 6962 for all products designated in United States Department of Agriculture (USDA) biopreferred Procurement Guidelines (7 CFR 2902, subpart B). The reporting period shall be from October 1 of each year through September 30 of the following year. The report shall be submitted in time to be received by December 15. This report shall be submitted at the address listed at [NETS](#). The report will be provided to the CO and GRC's EMB. The contractor's programs shall comply with applicable Federal, State, and local requirements, NASA environmental policy, and GRC's Environmental Program Manual, specifically including Section 6002 of 42 U.S.C. 6962, et seq., the Resource Conservation and Recovery Act; 7 U.S.C. 8102, the Farm Security and Rural Investment Act of 2002; and implementing regulations (40 CFR 247). See the [complete listing of all categories and products](#) designated in USDA's BioPreferredSM procurement guidelines.

If a SOW describes a requirement that is for (1) support services at Government-owned or –leased facilities or (2) contractor operation of Government-owned or –leased facilities, any resultant solicitation and contract must include the following:

1. FAR clause 52.223-10, Waste Reduction Program
2. FAR 23.203, Energy Product Reporting, including cost-effectiveness, as described in NPR [8570.1](#), Energy Efficiency and Water Conservation Technologies and Practices

The contractor shall submit a report for all operations and facilities covered by this contract about its program to promote and implement cost-effective waste reduction and energy-efficiency and water-conservation technologies and practices. Executive Order [13423](#), Strengthening Federal Environmental, Energy and Transportation Management, requires Federal agencies (1) to ensure that electronic products being acquired meet its requirements and that at least 95 percent of those requirements are met with an EPEAT-registered electronic product, unless there is no EPEAT standard for such product, and (2) to require agencies to use of sustainable environmental practices, including the acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products in their acquisitions of goods and services. The reporting period shall be from October 1 of each year through September 30 of the following year. The report shall be submitted in time to be received by December 15. This report shall be submitted to the address listed at [NETS](#). The report will be provided to the CO and GRC's EMB. The contractor's programs shall comply with applicable Federal, State, and local requirements, NASA environmental policy, and GRC's Environmental Program Manual, specifically including Section 6002 of 42 U.S.C. 6962, et seq., the Resource Conservation and Recovery Act. A complete listing of all categories and products designated in USDA's BioPreferredSM procurement guideline can be found at the [BioPreferred Web site](#).

**APPENDIX F.—FEDERAL ACQUISITION REGULATION (FAR)
 GREEN PURCHASING REQUIREMENTS**

FAR parts	Summary
Part 2	Contains definitions for biobased, energy efficient, energy-efficient standby power device, environmentally preferable, ozone-depleting substances, and recovered materials
Part 7	Requires agency planners to consider energy-efficient products and services, products containing energy-efficient standby power devices, products containing recovered materials, biobased products, and environmentally preferable products and services
Part 11	<p>Requires agencies to consider the maximum practicable use of energy and waste; low standby power; and biobased, recycled content, and environmentally preferable products and services when developing, reviewing, or revising specifications, product descriptions (including commercial item descriptions), and standards; when describing Government requirements for supplies and services; and when developing source-selection factors</p> <p>Requires that high-speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, white woven envelopes, writing and office paper, book paper, cotton-fiber paper, and cover stock contain no less than 50-percent postconsumer materials</p> <p>May require offerors to submit additional information on the recycled or biobased content or related standards; may require vendors for biobased products to provide information on life-cycle costs and environmental and health benefits</p>
Part 12	Provides for the use of provisions and clauses contained in Part 23 regarding the use of recovered material and biobased products when appropriate for the commercial item being acquired
Part 13	Applies procurement requirements in Subparts 23.2, 23.4, and 23.7 to purchases at or below the micropurchase threshold
Part 23	States that agencies shall assure the use of products containing recovered materials and biobased products to the maximum extent practicable without jeopardizing the intended use of the product and while maintaining a satisfactory level of competition at a reasonable price; requires that Federal agencies purchase ENERGY STAR® or Federal Energy Management Program- (FEMP-) designated products and, for products that consume power in a standby mode, those that are on FEMP's Low Standby Power Devices product listing; and states that agencies must maximize the utilization of environmentally preferable products and services, and must give preference to the procurement of alternative products that reduce overall risks to human health and the environment by lessening the depletion of ozone
Part 36	Requires that agencies comply with the requirements of FAR Subpart 23.2 when drafting facility design solicitations and contracts that include the specifications of energy-consuming products
Part 42	Requires the Government to monitor contractor compliance with specifications or other contractual requirements requiring the delivery or use of environmentally preferable products, energy-efficient products, products containing recovered materials, and biobased products

FAR clauses	Summary
	<p>Affirmative procurement</p> <p>52.223-1 Biobased Product Certification</p> <p>52.223-2 Affirmative Procurement of Biobased Products Under Service and Construction Contracts</p> <p>52.223-4 Recovered Materials Certification</p> <p>52.223-9 Estimate of Percentage of Recovered Material Content for EPA Designated Products (use only on contracts exceeding \$100,000)</p> <p>52.223-11 Ozone-Depleting Substances</p> <p>52.223-12 Refrigeration Equipment and Air Conditioners</p> <p>52.223-15 Energy Efficiency in Energy-Consuming Products</p> <p>52.223-16 IEEE 1680 Standard for the Environmental Assessment of Personal Computer Products (EPEAT Standard)</p> <p>Recycled-content paper</p> <p>52.204-4 Printed or Copied Double-Sided on Recycled Paper</p> <p>Support services and operations and maintenance contractors</p> <p>52.223-10 Waste Reduction Program</p>

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Chapter 10—Solid Waste

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was January 2013. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes policies and procedures for the reduction, reuse, recycling, and disposal of solid waste at Glenn Research Center (GRC).

2.0 APPLICABILITY

This chapter is applicable to all civil servant and contractor employees assigned to GRC sites and to any NASA-controlled, government-owned facilities associated with GRC.

3.0 BACKGROUND

Federal Government Agencies are driven by Executive Orders to reduce solid waste generation. Executive Order 13514—Federal Leadership in Environmental, Energy, and Economic Performance, specifically addresses the need for Federal Agencies to eliminate waste, recycle, and prevent pollution. The Resource Conservation and Recovery Act (RCRA), established in 1976, gave the Environmental Protection Agency (EPA) authority to regulate hazardous waste from generation to disposal. RCRA also sets the groundwork for nonhazardous solid waste management. In 1984, amendments to the RCRA known as the Hazardous and Solid Waste Amendments (HSWA) were implemented. Among other things, these amendments gave greater enforcement authority to the EPA and phased out the land disposal of hazardous waste.

4.0 POLICY

It is the policy of GRC to reduce solid waste by finding and using methods of reuse and recycling for all discarded materials; to comply with all Federal, State, and local regulations governing the generation, storage, shipment, and disposal of solid waste; and to conserve resources.

5.0 RESPONSIBILITIES

5.1 Waste Management Coordinator

The Waste Management Coordinator supports the Solid Waste Program by providing guidance on what materials are acceptable to be placed in solid waste collection dumpsters.

5.2 Chief of the Logistics and Technical Information Division

The Chief of the Logistics and Technical Information Division (LTID) provides storage/shipping containers for solid waste generated at GRC and Plum Brook Station (PBS), including trash and scrap metal dumpsters.

5.3 Property Disposal Officer

The Property Disposal Officer prepares and awards contracts for precious and nonprecious metal recycling and paper recycling.

5.4 Recycling Coordinator

The Recycling Coordinator plans and administers cost-effective recycling programs at GRC.

5.5 Chief of the Safety, Health and Environmental Division

The Chief reviews the Solid Waste Management Plan, manages audits of landfills and recycling facilities, and provides regulatory advice to the Facilities Division on solid waste disposal and to the LTID on recycling matters.

5.6 Glenn Research Center and Plum Brook Station Employees

Employees at GRC and PBS are the end users of the solid waste program. Employees are responsible for the correct disposition of the waste that they generate. The first option for employees that generate solid waste must be to reuse or to recycle it. Employees need to be aware of the types of materials and which are or are not appropriate for disposal in trash dumpsters and for placement in scrap metal containers. See Section 6.0 for material guidance.

6.0 REQUIREMENTS

NOTE: The following requirements are intended for general guidance only in the use of trash and scrap metal containers located throughout GRC. They do not replace the need to obtain a detailed review of the materials being considered for disposal. Questions concerning the disposal of any material or item should be directed to Waste Management at 3-2124.

6.1 Solid Waste Disposal (*Department of Defense 6050.5, Defense Reutilization and Marketing Service—M 6050.1, Executive Order 13514, Public Law 94-580 as amended, Ohio Revised Code Title 37 Chapter 3734, Environmental Programs Manual, Chapters 5, 6, and 23*)

6.1.1 Items Generally Acceptable for Disposal in Trash Dumpsters

- Bottles—Empty or contain only materials that are acceptable for trash dumpster disposal (must be less than 5-gallon size)
- Cans—Empty or contain only materials that are acceptable for trash dumpster disposal (must be less than 5-gallon size or flattened to eliminate void space)
- Disposable Freon containers—Completely empty and valve assembly removed
- Floor sweepings
- Landscaping debris
- Garbage
- Paint cans—Empty or contain only dried-out portions of water-based paint and no free liquid
- Boards and other scrap lumber (provided they are placed on the ground near the trash dumpster)

6.1.2 Items Generally Not Acceptable for Disposal in Trash Dumpsters

- Liquids—Any material that is a liquid or releases a free liquid
- Corrosives
- Batteries
- Chemicals
- Combustible or ignitable materials
- Compressed gas cylinders
- Compressors
- Fuels
- Light bulbs—Including, but not limited to, fluorescent, metal halide, mercury, or sodium vapor bulbs
- Light fixture ballasts
- Lumber or wood—Other than tiny pieces included in floor sweepings (see the special note about boards and other scrap lumber above)
- Metal—Recyclable
- Combustible or pyrophoric metals

- Oil
- Oil-, solvent-, or fuel-soaked rags—Contain free liquid
- Pallets
- Paint cans—Not empty and contain liquid paint of any type or contain solid (dried-out) oil-based paint
- Powdered metals
- Solvents—Recyclable materials
- GRC bar-coded chemical containers
- Hazardous waste—As defined in Environmental Programs Manual, Chapter 5

6.1.3 Items Generally Acceptable for Disposal in Scrap Metal Collection Containers

- Electrical wire
- Electric motors—Can be put in scrap metal collection containers but are typically segregated from general scrap metal where possible
- Steel bars, sheets, pipes, tubes, scraps, cuttings, etc.

6.1.4 Items Generally Not Acceptable for Disposal in Scrap Metal Collection Containers

- Any device, equipment, or container that contains asbestos, refractory ceramic fibers, polychlorinated biphenyls (PCBs), chemicals, and solid or hazardous waste
- Anything that contains a liquid
- Anything that can spill or leak onto the ground
- Appliances—Items that often have compressors and ballasts, which contain PCBs and frequently other objectionable materials
- Batteries
- Compressed gas cylinders
- Disposable Freon containers
- Drums—Recycled through a licensed-drum recycler
- Grease, oil, fuel, etc.
- Lead cuttings, borings, turnings, or grinding dust
- Organic material
- Paint cans—Contain paint residue
- Reactive metals—Such as magnesium or other hazardous metals
- Solid waste—Glass, paper, cardboard, plastic, roofing, rubber, or garbage
- Hazardous waste—As defined in Environmental Programs Manual, Chapter 5

7.0 RECORDS

- Solid Waste Disposal Totals.—Maintained by Contracting Officer's Technical Representative (COTR) of LTID Recycling and Solid Waste Removal Contract.

8.0 REFERENCES

Document number	Document name
DOD 6050.5 U.S.	Government Disposal Methods Guidelines
DRMS-M6050.1	Environmental Compliance for the DRMS Hazardous Property Program, June 1990 edition
Executive Order 13514	Federal Leadership in Environmental, Energy, and Economic Performance
NPD 8500.1B	NASA Environmental Management
ORC Title 37, Chapter 3734	Ohio Solid and Hazardous Waste Disposal Law
P.L 94-580 as amended	The Resource Conservation and Recovery Act (RCRA) of 1976

APPENDIX A.—DEFINITIONS AND ACRONYMS

Chemical Management System (CMS)

Contracting Officer's Technical Representative (COTR)

Department of Defense (DOD)

Defense Reutilization and Marketing Service (DRMS)

Environmental Protection Agency (EPA)

Facilities Division (FD)

Glenn Research Center (GRC)

Hazardous and Solid Waste Amendments (HSWA)

Logistics and Technical Information Division (LTID)

NASA Policy Directive (NPD)

Ohio Revised Code (ORC)

Polychlorinated biphenyl (PCB)

Plum Brook Station (PBS)

Pyrophoric metals.—Pyrophoric metals or alloys are solids that are liable to spontaneously ignite when exposed to air. In contact with water they are liable to evolve hydrogen, which is very flammable and could further intensify the fire.

Resource Conservation and Recovery Act (RCRA)

Safety, Health and Environmental Division (SHED)

Solid waste.—A solid waste is a material that, in general practice, is any discarded material not specifically excluded by the Resource Conservation Recovery Act (RCRA). A discarded material is any material (solid, liquid, or contained gas), which is abandoned (disposed, burned, or incinerated), recycled, or considered inherently waste-like. Basically, any material that does not have a continuing usefulness and is being discarded may be defined as a solid waste.

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Chapter 11—Floodplain and Wetlands Management

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes policies and procedures for dealing with projects and programs that could impact floodplains or wetlands at Glenn Research Center (GRC) Lewis Field and Plum Brook Station.

2.0 APPLICABILITY

This chapter is applicable to all GRC actions (Appendix A) that may have an impact on wetlands or floodplains at GRC or at any NASA-controlled, Government-owned facilities associated with GRC. It is applicable to GRC employees and contractors at all levels who in any way participate in the formulation, development, and execution of qualifying NASA actions.

3.0 BACKGROUND

In the 1600s, over 220 million acres of wetlands are thought to have existed in the lower 48 states. Since then, extensive losses have occurred, and over half of our original wetlands have been drained and converted to other uses. The years from the mid-1950s to the mid-1970s were a time of major wetland loss, but since then, the rate of loss has decreased.

In addition to these losses, many other wetlands have suffered degradation of functions, although calculating the magnitude of the degradation is difficult. These losses, as well as degradation, have greatly diminished our Nation's wetlands resources; as a result, we no longer have the benefits they provided. The increase in flood damages, drought damages, and the declining bird populations are in part the result of wetlands degradation and destruction.

4.0 POLICY

It is GRC policy to restore, preserve, and protect the natural and beneficial values provided by floodplains and wetlands. In carrying out this policy, GRC will avoid adverse impacts associated with the occupancy and modification of floodplains and wetlands.

The primary mechanism through which the Federal Government protects wetlands is Section 404 of the 1972 Clean Water Act. Section 404 has an established legal history of broad interpretation that requires that any actions that disturb or eliminate wetlands be approved by the Army Corps of Engineers. In conjunction with this law is a related set of laws governing the management of floodplains. These laws include the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Authority for floodplain management is included in Executive Orders 11988 and 11990. These orders require that each agency evaluate the potential effects of its actions on floodplains. Agencies should not undertake actions that directly or indirectly induce growth in the floodplain unless there is no practical alternative. Agency regulations and operating procedures for licenses and permits should include provisions for the evaluation and consideration of flood hazards.

5.0 RESPONSIBILITIES

5.1 Facilities Division (FD) National Environmental Policy Act Coordinator

The National Environmental Policy Act (NEPA) Coordinator reviews all proposed projects to identify activities in floodplain and wetlands and works with the NEPA Program Lead for floodplain or wetlands permit applications.

5.2 FD Program Managers

The FD Program Managers coordinate with the SHED NEPA Program Lead on any proposed projects with the potential to impact wetlands or floodplains.

5.3 NEPA Program Lead

The NEPA Program Lead maintains an inventory of all known GRC floodplain and wetlands maps. The Program Lead validates the need for permit applications. The NEPA Program Lead is responsible for consulting with the SHED Chief regarding the necessity of applying to the Army Corps of Engineers for a permit and also reviews all floodplain and wetlands permit applications. The NEPA Program Lead maintains copies of all existing floodplain and wetlands permits.

5.4 Supervisors

All GRC supervisors shall be cognizant of GRC policy regarding floodplain and wetlands management and shall use their authority to uphold the goals of this program.

6.0 REQUIREMENTS

6.1 Comply With Section 404 of the 1972 Clean Water Act

Actions that could meet these criteria are brought to the attention of the NEPA Program Leads through the NEPA review process (Chapter 2). If the proposed action warrants a permit application, the NEPA Program Lead shall follow the procedures outlined in Section 404. A generalized flowchart of wetland and floodplain actions review process at GRC is portrayed in Appendix B.

6.2 Comply With Coastal Zone Management Program (15 CFR Part 923)

The Coastal Zone Management Act (CZMA) was enacted to encourage coastal states, Great Lake states, and United States territories to develop comprehensive programs to manage and balance competing uses of and impacts to coastal resources. This act applies to isolated properties belonging to Plum Brook Station with Ohio's coastal zone.

7.0 RECORDS

- Floodplain and wetland maps (from the Army Corps of Engineers).—Maintained by the NEPA Program Lead. Wetlands at Lewis Field and Plum Brook Station have not been officially delineated. Reference can be made to the *Final Protected Species Management Strategy for NASA Glenn Research Center at Lewis Field and Plum Brook Station, Volume II: Plant Community Survey* (SAIC 2002) for the probable locations of wetlands at GRC.
- Permit applications.—Maintained by the NEPA Program Lead.

8.0 REFERENCES

Document Number	Document Name
15 CFR Part 923	Federal Coastal Zone Management Program Regulations
33 CFR Parts 320 through 336	U.S. Army Corps of Engineers Regulatory Program
40 CFR Parts 22, 230 through 233	Environmental Protection Agency Wetlands Protection
Executive Order 11988	Floodplain Management
Executive Order 11990	Protection of Wetlands

Safety and Mission Assurance Directorate (SMAD)

Safety, Health and Environmental Division (SHED)

Chapter Lead: Richard Kalynchuk, SAIC

Web Curator: Sandra Jacobson, SAIC

Last Revised: September 2009

APPENDIX A.—DEFINITIONS AND ACRONYMS

Action.—Activity including, but not limited to, the acquisition, construction, modification, change in land use, issuance of facilities use permits, and disposition of Federal lands and facilities.

Coastal Zone Management Act (CZMA).—The act provides for management of the Nation’s coastal resources, including the Great Lakes, and balances economic development with environmental conservation.

Code of Federal Regulations (CFR)

Critical action.—Any activity for which even a slight chance of flooding would be too great, such as storing highly toxic materials.

Facilities Division (FD)

Floodplain.—The lowland and relatively flat areas adjoining inland and coastal waters, including the flood-prone areas of offshore islands and including, at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year. The base floodplain shall be used to designate the 100-year floodplain (1 percent chance floodplain). The critical action floodplain is defined as the 500-year floodplain (0.2 percent chance floodplain). A large portion of GRC floodplains also encompasses wetlands.

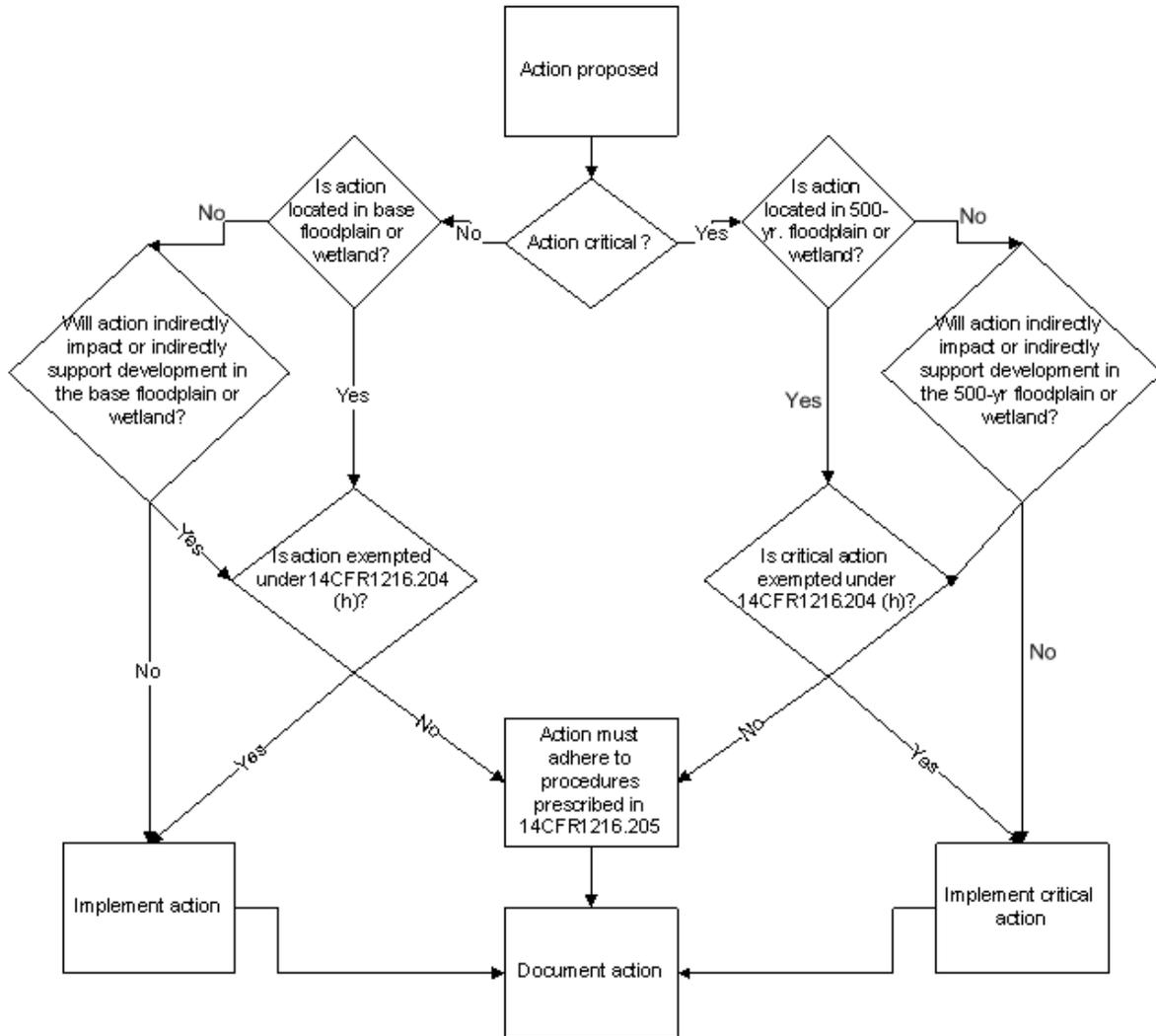
Glenn Research Center (GRC)

National Environmental Policy Act (NEPA).—Federal legislation that establishes the national policy for protecting the human environment. Refer to Chapter 2.

Safety, Health and Environmental Division (SHED)

Wetlands.—Those areas that are frequently inundated by surface or ground water and normally support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, river overflows, wet meadow, and natural ponds.

APPENDIX B.—WETLAND AND FLOODPLAIN ACTIONS REVIEW PROCESS



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Chapter 12—Endangered and Threatened Species

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes policies and procedures for dealing with NASA Glenn Research Center (GRC) projects and programs that could affect threatened or endangered species.

2.0 APPLICABILITY

This chapter is applicable to all GRC actions that may have an impact on threatened or endangered species at GRC and at any NASA-controlled, Government-owned facilities associated with GRC. It is applicable to GRC employees and contractors at all levels who participate in the formulation, development, and execution of qualifying NASA actions.

3.0 BACKGROUND

Many species of animals and plants have become endangered or threatened within Ohio because of habitat destruction, harvesting, hunting, and pollution. Congress has recognized these species as having aesthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people. It is the policy of Congress that all Federal departments and agencies seek to conserve, to the extent practicable, the various species of fish or wildlife and plants facing extinction. Federal agencies must ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat.

4.0 POLICY

It is the policy of GRC to comply with all applicable Federal and state regulations with regards to endangered and threatened species. These regulations include the Endangered Species Act (ESA) of 1973, Endangered and Threatened Wildlife and Plants (50 Code of Federal Regulations (CFR) 17), and Special Endangered Wild Animal Regulations (Ohio Administrative Code (OAC) 1501:31-23-01).

5.0 RESPONSIBILITIES

5.1 National Environmental Policy Act Program Leads at Lewis Field and Plum Brook Station

The National Environmental Policy Act (NEPA) Program Leads at Lewis Field and Plum Brook Station must review proposed projects at their respective sites for impacts on threatened or endangered species. They also plan and implement policies and procedures at their respective sites that that comply with GRC policy.

5.2 Facilities Division Supervisors

All GRC supervisors shall be cognizant of GRC policy regarding threatened and endangered species and shall use their authority to uphold the goals of this program.

5.3 All Employees

All GRC employees shall be cognizant of GRC policy regarding threatened and endangered species and shall conduct their jobs in a manner that upholds the goals of this program.

5.4 Safety, Health and Environmental Division Program Leads

All Safety, Health and Environmental Division (SHED) Program Leads shall be cognizant of GRC policy regarding threatened and endangered species and shall exercise their programs in a manner that upholds the goals of this program.

6.0 REQUIREMENTS

6.1 Procedural Requirements of the Endangered Species Act of 1973 (16 U.S.C. 1531–1544)

6.1.1 Project Review, Consultation, and Mitigation

Section 7.0 of the ESA requires Federal agencies to ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of listed species or modify their critical habitat. Actions which could meet these criteria are brought to the attention of the NEPA Program Leads through the NEPA review process (Environmental Programs Manual, Chapter 2). If a proposed action meets any of these criteria, the NEPA Program Leads will consult with the appropriate agency until mutually satisfactory mitigation measures are agreed upon.

Under ESA, all Federal agencies must utilize their authorities, as appropriate, to promote the recovery of listed species.

7.0 RECORDS

Known occurrences of threatened and endangered species at GRC.—Maintained by the NEPA Program Leads.

Records of consultations with outside agencies.—Maintained by the NEPA Program Leads.

8.0 REFERENCES

Document number	Document name
16 USC 1531–1544	The Endangered Species Act of 1973
50 CFR 17	Endangered and Threatened Wildlife and Plants
OAC 1501:31–23–01	Special Endangered Wild Animal Regulations
GLM-QS-8500.1	Glenn Research Center, Environmental Programs Manual, Chapter 2

Safety and Mission Assurance Directorate ([SMAD](#))

Safety, Health and Environmental Division ([SHED](#))

Chapter Lead: [Rosemary Giesser](#), SAIC

Web Curator: [Sandra Jacobson](#), SAIC

Last Revised: February 2010

APPENDIX A—DEFINITIONS AND ACRONYMS

Code of Federal Regulations (CFR).—A part of the Federal Register System, CFR exists to record the body of administrative law. Administrative law is based on recognition that the business of government must be transacted efficiently, and that Congress must therefore delegate some of its authority to the agencies and people who actually transact that business.

Critical habitat.—May be designated for listed species and consists of (1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of the Endangered Species Act, on which are found those physical or biological features (constituent elements) (a) essential to the conservation of the species and (b) which may require special management considerations of protection and (2) specific areas outside the geographic area occupied by the species at the time it is listed in accordance with the provisions of the Endangered Species Act, upon a determination by the Secretary of the Interior or the Secretary of Commerce that such areas are essential for the conservation of the species.

Endangered species.—Any species that is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insect that has been determined to be a pest whose protection under the provisions of this Endangered Species Act would present an overwhelming and overriding risk to humans.

Endangered Species Act (ESA)

NASA Glenn Research Center (GRC)

National Environmental Policy Act (NEPA).—Directs Federal agencies to conduct environmental reviews for proposed actions.

Ohio Administrative Code (OAC)

Safety and Mission Assurance Directorate (SMAD)

Safety, Health and Environmental Division (SHED)

Threatened species.—Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

United States Code (U.S.C.)

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Chapter 13—Emergency Planning and Community Right To Know

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter provides the requirements for compiling and reporting information concerning potential chemical hazards at Glenn Research Center (GRC) for both the employees, and community.

2.0 APPLICABILITY

This chapter is applicable to all civil servants and contractor employees assigned to GRC at Lewis Field and Plum Brook Station, and to any NASA-controlled, Government-owned facilities associated with GRC.

3.0 BACKGROUND

The Emergency Planning and Community Right-To-Know Act (EPCRA) was enacted in October 1986 in response to growing concern about the effect of chemical releases on communities. Although enacted as part of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III), EPCRA is a freestanding law. It is intended to encourage and support emergency planning efforts at the State and local levels and to provide citizens and local governments with information concerning chemical releases and the potential chemical risks present in their communities.

This chapter conforms to the GRCs Environmental Management System (EMS) Manual as defined in GLPR **8553.1**. This chapter supports the GRC Environmental Policy, promoting pollution prevention, regulatory compliance, and continuous improvement.

4.0 POLICY

It is the GRC policy to support our missions in an environmentally, economically, and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. As part of the policy, the Center shall maintain Material Safety Data Sheets (MSDSs) and shall provide a chemical inventory for the employees. Annually, current hazardous material information from the chemical inventory is provided to the local fire department, the Local Emergency Planning Committee (LEPC), and the State Emergency Response Commission (SERC) for EPCRA. The implementing regulations for emergency planning, emergency release notification and the chemicals subject to these regulations are codified in 40 Code of Federal Regulation (CFR) Part 355. The implementing regulations for community right-to-know reporting (or hazardous chemical reporting) are codified in 40 CFR Part 370.

5.0 RESPONSIBILITIES

5.1 SHED Compliance Team

- The UST/AST Program Lead shall provide a current tank list with the hazardous material information to the SHED Operations Team to prepare the Inventory Reporting.

5.2 Logistics and Technical Information Division (LTID)

- LTID shall provide or give access to the LTID Applications website for hazardous material information to the SHED Operations Team to prepare the Inventory Reporting.

5.3 Contractors

- The contractors shall provide inventory information as stated in Federal Acquisition Circulars form the Federal Acquisition Regulation 52.223-5 (c) Pollution Prevention and Right-to-Know Information as stated below:

The Contractor shall provide all information needed by the Federal facility to comply with the following:

- (1) The emergency planning reporting requirements of Section 302 of EPCRA.
- (2) The emergency notice requirements of Section 304 of EPCRA.
- (3) The list of Material Safety Data Sheets, required by Section 311 of EPCRA.
- (4) The emergency and hazardous chemical inventory forms of Section 312 of EPCRA.
- (5) The toxic chemical release inventory of Section 313 of EPCRA, which includes the reduction and recycling information required by Section 6607 of PPA.
- (6) The toxic chemical priority chemical, and hazardous substance release and use reduction goals of Section 502 and 503 of Executive Order 13148

5.4 SHED Facility Team

- The Air Program Lead shall provide hazardous material information to the SHED Operations Team to prepare the Emissions Reporting.

5.5 SHED Operations Team

- Prepares and submits the Emergency and Hazardous Chemical Inventory Forms to the Ohio SERC, the Cuyahoga County Department of Community Services, and the Brook Park Fire Department for Lewis Field.
- Evaluates annual chemical usage and prepares (if necessary) and submits the U.S. Environmental Protection Agency (EPA) Toxic Release Inventory Form(s) to the U.S. EPA Region 5 and Ohio EPA for Lewis Field. If no reporting thresholds are exceeded, the chemical usage shall be evaluated, documented, and filed for threshold calculations in the SHED file system for a 3-year period.
- In accordance to Executive order 13514, reports in accordance with the requirements of Sections 301 through 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (42 U.S.C> 11001 et seq.).
- Maintains the chemical inventory and the MSDS files.

5.6 SHED Plum Brook Team

- Prepares the Emergency and Hazardous Chemical Inventory Forms to submit to the SERC, the Erie County Emergency Management Agency, and the Perkins Township Fire Department for Plum Brook Station.
- Evaluates annual chemical usage and prepares (if necessary) the U.S. EPA Toxic Release Inventory Form(s) to submit to the U.S. EPA Region 5 and Ohio EPA for Plum Brook Station. If no reporting thresholds are exceeded, the chemical usage shall be evaluated, documented, and filed for threshold calculations in the Plum Brook Station file system for a 3-year period. Maintains the chemical inventory provided by the Plum Brook support service contractor (SSC) and the MSDS files for Plum Brook Station.

6.0 REQUIREMENTS

6.1 Inventory Reporting

The EPCRA requires that GRC, which prepares or has available MSDSs for hazardous chemicals under the Occupational Safety and Health Administration (OSHA), prepares and submits an Emergency and Hazardous Chemical Inventory Form to the Ohio EPA, Ohio SERC, the LEPC, and the local fire department with jurisdiction over the facility (Lewis Field or Plum Brook Station).

GRC at Lewis Field and Plum Brook Station are subject to report because they both meet the requirement of a facility that maintains hazardous chemicals in amounts above established reporting threshold quantities

The U.S. EPA has published a list of extremely hazardous substances in 40 CFR Part 355 and has established a permanent threshold planning quantity for each substance on the list. The reporting thresholds currently apply to hazardous chemicals present at a facility in quantities equal to or greater than 10,000 lb or to extremely hazardous substances present in quantities equal to or greater than 500 lb (nominally 55 gal), or the threshold planning quantity (TPQ), whichever is less.

GRC shall submit the inventory forms annually by March 1 for both facilities. In compliance with EPCRA requirements, GRC reports on those hazardous chemicals or extremely hazardous substances that are present at any time during the year in quantities equal to or greater than the TPQs.

Ohio State Emergency Response Forms (Ohio EPA Forms 0316 and 0317) are used by GRC to fulfill the annual (by March 1) reporting requirements.

6.2 Emissions Reporting

The EPCRA also requires a report of emissions of toxic chemicals from facilities that manufacture, process, import, or otherwise use a listed toxic chemical above the threshold quantities. If thresholds are exceeded, Executive Order 13423 extends this reporting requirement to Federal facilities. The U.S. EPA Toxic Release Inventory Reporting Form (Form R) is used by GRC for reporting this information annually to the EPA by July 1.

7.0 RECORDS

- Ohio State Emergency Response Forms (Ohio EPA Forms 0316 and 0317).—Maintained by SHED Operations Team for Lewis Field and SHED Plum Brook Team for Plum Brook Station.
- U.S. EPA Toxic Chemical Release Inventory Reporting Form R.—Maintained by SHED Operations Team for Lewis Field and SHED Plum Brook Team for Plum Brook Station.

8.0 REFERENCES

Document Number	Document Name
29 (CFR) 1910.1200	Hazard Communication Standard
40 CFR 350	Trade Secrecy Claims for Emergency Planning and Community Right-to-Know Information, and Trade Secret Disclosures to Health Professionals
40 CFR 355	Emergency Planning and Notification
40 CFR 370	Hazardous Chemical Reporting; Community Right-to-Know
40 CFR 372	Toxic Chemical Release Reporting; Community Right-to-Know.
Executive order 13148	Greening the Government Through Leadership in Environmental Management.
Executive Order 13423	Strengthening Federal Environmental, Energy, and Transportation Management.
Executive Order 13514	Federal Leadership in Environmental, Energy, and Economic Performance
GLM–QS–8500.1	NASA Glenn Environmental Programs Manual, Chapter 16 HAZCOM Program, Chapter 17, Chemical Inventory Plan
GLM–QS–8500.1	NASA Glenn Environmental Programs Manual, Chapter 15, Acquisition of Hazardous Chemicals and Materials
GLM–QS–8500.1	NASA Glenn Environmental Programs Manual, Chapter 16, Hazard Communication Policy

APPENDIX A.—DEFINITIONS AND ACRONYMS

Code of Federal Regulations (CFR)

Environmental Management System (EMS)

Environmental Protection Agency (EPA)

Emergency Planning and Community Right-to-Know Act (EPCRA)

Glenn Procedural Requirement (GLPR)

Glenn Research Center (GRC)

Hazardous chemical.—Any chemical that is a physical or health hazard as defined by Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1200, Hazard Communication Standard.

Hazardous material.—Any material defined as hazardous under 40 CFR 171.8, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and which has been so designated. Such material has one or more toxic, flammable, corrosive, or reactive properties. All materials listed under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 are included.

Local Emergency Planning Committee (LEPC)

Material Safety Data Sheet (MSDS)

Occupational Safety and Health Administration (OSHA)

Release.—Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, dumping, or disposing into the environment (including abandonment or discarding of barrels, containers, and other closed receptacles) of any toxic chemical.

Superfund Amendments and Reauthorization Act (SARA)

State Emergency Response Commission (SERC)

Safety, Health and Environmental Division (SHED)

Support service contractor (SSC)

Threshold planning quantity (TPQ).—The quantity for an extremely hazardous substance as defined in 40 CFR 355.

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Chapter 14—Oil-Filled Equipment

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes programmatic requirements for the inspection and regulatory compliance of oil-filled equipment. The policies and procedures outlined in this chapter will help reduce spills, leaks, and releases from oil-filled equipment that could potentially enter waterways and soils.

2.0 APPLICABILITY

This chapter applies to all personnel at NASA Glenn Research Center (GRC) who utilize or maintain oil-filled equipment with capacities of 55 gallons or more. This chapter encompasses oil-filled electrical, operating, and manufacturing equipment, but excludes bulk storage containers. Examples of oil-filled equipment include, but are not limited to, elevator reservoirs, oil-filled transformers, lubricating systems (for compressors, pumps, and other rotating equipment), gear boxes, heat transfer systems, machining coolant systems, and oil-filled circuit breakers.

3.0 BACKGROUND

Originally published in 1973 under the authority of Section 311 of the Clean Water Act, the Oil Pollution Prevention regulations set forth requirements for prevention of, preparedness for, and response to oil discharges at specific non-transportation-related facilities. To prevent oil from reaching navigable waters and adjoining shorelines, and to contain discharges of oil, the regulation requires these facilities to develop Spill Pollution Control & Countermeasure (SPCC) plans. Such facilities must establish procedures, methods, and equipment requirements for both preventing and cleaning up oil discharges.

4.0 POLICY

It is GRC policy to follow the requirements and recommendations of all relevant Federal, state, and local regulations applicable to oil-filled equipment. The complete regulatory texts should be consulted for further details. The following are authorities that presently regulate oil-filled equipment at GRC and are incorporated by reference:

1. 29 Code of Federal Regulations (CFR) 1910.106, Flammable and Combustible Liquid Standard
 - a. The Occupational Safety and Health Administration (OSHA) enacted regulations applicable to flammable and combustible liquids used in the workplace. These regulations specify the special precautions that shall be taken to ensure that flammable and combustible liquids are handled and stored safely.
2. 40 CFR 112, Oil Pollution Prevention
 - a. This regulation is applicable to oil-filled equipment with capacities of 55 gallons or greater.
 - b. Facilities subject to this rule must prepare and implement a plan to prevent any discharge of oil into or upon navigable waters of the United States or adjoining shorelines.
 - c. This rule provides the policies and procedures to prevent, control, and administer countermeasures to oil spills.
3. 40 CFR 122, National Pollutant Discharge Elimination System
 - a. This regulation requires a permit for storm water runoff. It addresses pollution in precipitation runoff that is discharged from certain industrial sites, construction sites disturbing 1 acre or more, and urban storm sewers.
 - b. Regulations are applicable to any releases of contaminated rain water from secondary containment into navigable waters of the United States.

4. National Fire Protection Association (NFPA) 30 and 30A
 - a. These codes apply to the storage, handling, and use of flammable and combustible liquids, including waste liquids.
5. Ohio Fire Code, Chapter 34
 - a. The Ohio Fire Code addresses prevention, control, and mitigation of dangerous conditions related to the storage, use, dispensing, mixing, and handling of flammable and combustible liquids.

5.0 RESPONSIBILITIES

5.1 All GRC Personnel

Any person who causes or discovers a spill at Lewis Field or Plum Brook Station (PBS) shall immediately notify emergency dispatch by calling 911 on a GRC in-house phone line. When using a cell phone, dial 216-433-8888 at Lewis Field or 419-621-3222 at PBS. For further guidance, refer to Lewis Field or PBS's Integrated Contingency Plan (ICP).

5.2 Aboveground Storage Tank (AST) Program Lead

At Lewis Field, the AST Program Lead inspects oil-filled equipment (see Appendix B) as part of the AST program to ensure that the equipment is in compliance with the Oil Pollution Prevention Act as well as with the provisions of the ICP. At PBS, the PBS Team shall perform this task.

5.3 Human Capital Development Branch Chief

The Human Capital Development Branch Chief is responsible for the maintenance of training records for SPCC and AST training modules on the System for Administration, Training and Educational Resources for NASA (SATERN) system. This includes trainings conducted both online and in person.

5.4 Spill Response Lead

At Lewis Field, the Spill Response Lead shall respond to liquid spills of any type once notified by Security Emergency Dispatch and shall ensure that proper clean-up methods are implemented. The Spill Response Lead is also responsible for creating and updating the SPCC plan and Chapter 8, Spill Control, in the Environmental Programs Manual at GRC. At PBS, the PBS Team shall perform these tasks.

5.5 Fuel Distribution Supervisor

The Fuel Distribution Supervisor shall ensure that employees involved in the receiving, transport, and transfer of oil and fuel at GRC receive annual Resource Conservation and Recovery Act (RCRA), SPCC, water pollution, AST, and Underground Storage Tank (UST) training. Employees shall comply with applicable provision of the ICPs at Lewis Field or PBS. At PBS, the onsite maintenance contractor handles oil and fuel receiving, transfer, and delivery.

5.6 Onsite Maintenance Contractors

Onsite maintenance contractors are responsible for the operation, maintenance, and monthly inspections of oil-filled equipment under their use and supervision at either Lewis Field or PBS per details outlined in the ICPs for each site.

6.0 REQUIREMENTS

6.1 Training (40 CFR 112.7 (f); GLM-QS-8500.1, Chapter 8)

All personnel who utilize, handle, store, or deliver petroleum-based products shall annually complete SPCC training through SATERN (course number GRC-006-08). At PBS, the SPCC training is a modified version of the SATERN Lewis Field module and is currently taught via an in-class presentation.

6.1.1 Employee completion of SPCC training is documented in SATERN, which is accessible by the reporting function of an administrative SATERN session.

6.2 Maintenance Personnel or Operator Monthly Oil-Filled Equipment Inspections (40 CFR 112.8 (c)(6))

Maintenance personnel or operators of oil-filled equipment shall complete monthly inspections of their equipment to ensure equipment is not leaking. If leaks are discovered, they shall be promptly cleaned up, and repairs shall be made. Inspections shall be recorded on the Oil-filled Equipment Monthly Inspection form provided by SHED and kept onsite. See Appendix B for an example of the form used at GRC.

6.2 Monthly oil-filled equipment inspection records are maintained by the maintenance personnel or operator onsite.

6.3 SHED Annual Oil-Filled Equipment Inspections (40 CFR 112.8 (c)(6))

At Lewis Field, the AST Program Lead shall annually inspect oil-filled equipment to ensure that the equipment is in compliance with the Oil Pollution Prevention Act and that monthly inspection reports are completed by maintenance personnel or operators. The AST Program Lead shall also check to see that spills/leaks are being promptly handled and that spill kits are adequately stocked (see Appendix B). The PBS Team shall perform the annual inspections at PBS.

6.3 Annual oil-filled equipment inspection records are maintained by the AST Program Lead of the SHED at Lewis Field and by the PBS Team at Plum Brook Station.

6.4 Contact List of Oil-Filled Equipment Maintenance Personnel and/or Operators

A list specifying the name of the maintenance personnel or operator and contact information for each piece of oil-filled equipment at Lewis Field shall be maintained and updated as needed by the AST Program Lead. At PBS, this list shall be maintained and updated by the PBS Team.

6.4 The contact list for oil-filled equipment maintenance personnel/operators is maintained by the AST Program Lead of the SHED at Lewis Field and by the PBS Team at Plum Brook Station.

6.5 General Secondary Containment (40 CFR 112.7 (c))

Appropriate containment and/or diversionary structures shall be provided for oil-filled equipment with a storage capacity of 55 gallons or greater. The entire containment system, including walls and floor, must be capable of capturing oil and preventing it from discharging to the environment. When determining the size of secondary containment needed for the oil-filled equipment, you need only to address the volume of the largest piece of equipment in the containment area; 100 percent of this volume shall be contained. If the oil-filled equipment is located outdoors, the secondary containment shall accommodate 110 percent of the volume of the largest piece of equipment to account for precipitation.

6.5.1 Manual Drainage of Secondary Containment (40 CFR 112.8 (b))

For oil-filled equipment with a storage capacity of 55 gallons and up, if exposed to precipitation, containment shall be drained on a frequent basis to maintain the required containment capacity. The tank maintenance personnel or operator shall notify SHED before releasing accumulated water from secondary containment. SHED shall inspect the accumulated water and grant approval to empty the secondary containment of all oil-filled equipment susceptible to rain and snow accumulation. SHED shall document the inspection and approval. No GRC personnel shall discharge water accumulation from a secondary containment without first receiving SHED approval.

6.5.1 Records for manual drainage of secondary containment are maintained by the AST Program Lead in the SHED at Lewis Field and by the PBS Team at Plum Brook Station.

6.5.2 Alternatives to Secondary Containment (40 CFR 112.7 (k) (2))

If secondary containment for oil-filled equipment with a capacity of 55 gallons and up is not feasible or practicable, then (1) procedures shall be established and documented for a monitoring program to detect equipment failure and/or a

discharge and (2) a written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged shall be developed. The maintenance personnel or operator of the oil-filled equipment shall prepare this detailed plan, and it shall be reviewed and approved by the AST Program Lead at Lewis Field or the PBS Team at Plum Brook Station. Approved plans will be incorporated into the respective Center's ICP.

6.6 Spill Kits (40 CFR 112)

A spill kit shall be located within the line of sight from the oil-filled equipment. The oil-filled equipment maintenance personnel/operator is responsible for supplying and replenishing these kits.

6.6 The presence of an adequately stocked spill kit will be verified by oil-filled equipment maintenance personnel/operators during monthly inspections. SHED personnel and the PBS Team will verify the presence of an adequately stocked spill kit during their annual inspections.

6.7 GRC Integrated Contingency Plan (ICP)

The GRC ICPs for Lewis Field and PBS shall outline procedures for handling unplanned oil releases or spills in order to minimize hazards to human health and the environment.

6.8 Fire Protection (NFPA 10: 6.3.1.1; NFPA 30; Ohio Fire Code)

A fire extinguisher with a minimum of a 40-B rating shall be placed in a clearly marked location no greater than 30 ft away from the oil-filled equipment.

6.8 The presence of a fire extinguisher will be verified during monthly inspections by the oil-filled equipment maintenance personnel or operator. SHED personnel and the PBS Team will verify the presence of a properly rated fire extinguisher during their annual inspections.

6.9 Oil-Filled Equipment Signage (29 CFR 1910.1200; Ohio Fire Code 2007)

All oil-filled equipment with a capacity of 55 gallons and greater shall be properly labeled with the name of the contents (i.e., lube oil), the appropriate NFPA label based on contents, and a unique identification number (designated by the AST Program Lead for Lewis Field or the PBS Team at Plum Brook Station). Emergency contact information shall be posted onsite.

6.9 Proper signage on oil-filled equipment will be verified by SHED personnel and the PBS Team during annual inspections.

7.0 RECORDS

- Completed annual sets of monthly oil-filled equipment inspection forms.—Maintained by the equipment maintenance personnel/operator (see Appendix B).
- SHED annual oil-filled equipment inspection/audit forms.—Maintained by the AST Program Lead at Lewis Field and the PBS Team at Plum Brook Station (see Appendix B).
- Oil-filled equipment maintenance personnel/operator contact list.—Maintained by the AST Program Lead at Lewis Field and the PBS Team at Plum Brook Station.
- Training records.—Maintained by the Human Capital Development Branch. (In the case of a Support Service Contractor, these records could be maintained by the employer.)

8.0 REFERENCES

Document number	Document Name
29 CFR 1910.106	OSHA Flammable & Combustible Liquid Standard

40 CFR 112	Oil Pollution Prevention
40 CFR 122	National Pollutant Discharge Elimination System (NPDES), Storm Water Permit Regulations
2007 Ohio Fire Code, OAC 1301: 7-7-34	Flammable and Combustible Liquids
NFPA 10	Standard for Portable Fire Extinguishers
NFPA Codes 30 and 30A	Flammable and Combustible Liquids; Code for Motor Fuel Dispensing Facilities, Repair Garages, and Aircraft Refueling
GLM-QS-8500.1	NASA Glenn Environmental Programs Manual, Chapter 8, Spill Control
GLM-QS-8500.1	NASA Glenn Environmental Programs Manual, Chapter 17, Chemical Hygiene Policy
GLM-QS-8500.1	NASA Glenn Environmental Programs Manual, Chapter 25, Aboveground Storage Tanks
Lewis Field ICP	
Plum Brook Station ICP	

APPENDIX A.—DEFINITIONS AND ACRONYMS

Aboveground Storage Tank (AST)

Bulk storage container.—Any container used to store oil with a capacity of 55 gallons or greater.

Code of Federal Regulations (CFR)

Combustible liquid.—A liquid having a cup flashpoint at or above 100 °F and subdivided into three categories:

- Class II, liquids having a closed-cup flashpoint at or above 100 °F and below 140 °F
- Class IIIA, liquids having a closed-cup flashpoint at or above 140 °F and below 200 °F
- Class IIIB, liquids having a closed-cup flashpoint at or above 200 °F

Emergency Planning and Community Right-to-Know Act (EPCRA)

Flammable liquid.—A liquid having a closed-cup flashpoint below 100 °F, and subdivided further into three categories:

- Class IA, liquids having a flashpoint below 73 °F and a boiling point below 100 °F
- Class IB, liquids having a flashpoint below 73 °F and a boiling point at or above 100 °F
- Class IC, liquids having a flashpoint at or above 73 °F and a boiling point below 100 °F

Glenn Research Center (GRC)

Integrated Contingency Plan (ICP).—A comprehensive plan that provides procedures for emergency preparedness and response allowing a facility to comply with various regulations. The objective of the plan is to minimize the threat to human health and the environment from incidents such as fires, explosions, unplanned oil releases/spills, and the release of hazardous chemicals into the air, soil, or water.

National Fire Protection Association (NFPA).—The mission of the NFPA is to reduce the worldwide crisis of fire and other hazards on the quality of life by providing and promoting codes and standards.

National Pollutant Discharge Elimination System (NPDES)

Ohio Administrative Code (OAC)

Oil.—Oil of any kind in any form, including but not limited to, fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil.

Oil-filled equipment.—Oil-filled electrical, operating, or manufacturing equipment, excluding bulk storage containers. Examples of oil-filled equipment includes, but is not limited to, elevator reservoirs, oil-filled transformers, lubricating systems (for compressors, pumps, and other rotating equipment), gear boxes, heat transfer systems, machining coolant systems, and oil-filled circuit breakers.

Resource Conservation and Recovery Act (RCRA)

Safety, Health and Environmental Division (SHED)

Secondary containment.—Dikes, containment curbs, pits, pallets with spill bladders, etc., designed to contain a spill or release of oil. Secondary containment should be designed to accommodate the capacity of the largest single container in an area.

System for Administration, Training and Educational Resources for NASA (SATERN)

Spill Prevention Control and Countermeasure (SPCC) plan.—A plan required by facilities subject to 40 CFR 112 to prevent any discharge of oil into or upon navigable waters of the United States. The SPCC is incorporated into the respective ICPs for Lewis Field and Plum Brook Station.

Underground Storage Tank (UST)

APPENDIX B.—EXAMPLES OF FORMS

B.1 Example: SHED Annual Oil-Filled Equipment Site Inspection Form

NASA Glenn Research Center

SHED Oil-Filled Equipment Annual Inspection Form

Date of Inspection: _____ SHED Inspector Name: _____

Date of Re-inspection: _____

Building No. and Description: _____ System: _____

Equipment ID/Location: _____ Contact: _____

Oil-Filled Equipment and Piping Related:	Yes	No	NA
1. NFPA Label, Unique ID, and Content Labeling exist and are appropriate for the product contained?			
2. Tank level gauge is present and is operating or reading tank levels correctly?			
3. The equipment is free of excessive corrosion, distortion, and dents or bulging?			
4. The equipment is free of signs of leaks, drips, or a potential for release?			
5. The associated piping is free of leaks, damage, wet fittings, bowing, or excessive corrosion?			
6. Access to the equipment is free of obstructions?			
Containment Related:	Yes	No	NA
7. Secondary containment is free of damage or breeches in the containment wall, berm, or curbing?			
8. Secondary containment drain valve is operational and kept in the closed position?			
9. Secondary containment is free of product, water, and/or debris?			
10. Secondary containment is free of equipment or containers that may reduce the size of the containment?			
11. Hazardous or incompatible chemical or product storage is not present in the same containment?			
Spill/Fire Response Related:	Yes	No	NA
12. Spill kit is in-line-of-sight of tank or drums and adequately stocked?			
13. Fire extinguisher is within 30 feet of site and in-line-of-sight or a sign is posted to its location?			
14. Emergency contact information is posted in the building and available to all personnel?			
Operator Related:	Yes	No	NA
15. Operator is completing monthly inspections properly and is keeping them onsite?			
16. Operator is addressing leaks, damage, or other noted concerns in a prompt manner?			

COMMENTS/FINDINGS:

FOLLOWUPS/UPDATES:

B.2 Example of Oil-Filled Equipment Monthly Inspection Form

NASA Glenn Research Center

Oil-filled Equipment Monthly Inspection Form—Building XX

Equipment to be inspected:

- Transformer XXX

Attention Designated Inspector: Please answer YES (Y or ✓) or No (N or X) for the following questions and state corrective actions to be taken for those items marked with an N or X. Please add your initials in the last box with the corrective actions required. **Use reverse side of this form to notate observations/ corrective actions.**

Date	Spill kit present and stocked?	Fire extinguisher present?	Tank is free of leaks, corrosion, and bowing?	If applicable, is secondary containment free of damage?	Are there any leaks or drips visible from associated piping?	Identification labels and NFPA placards present?	Corrective actions required? Inspector initials

Please keep this document at the tank site at a designated area for collection by the Safety, Health and Environmental Division (SHED)
 Please contact SHED at 3-6468 for questions regarding this document or the equipment being inspected.

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Chapter 15—CERCLA Environmental Remedial Activities

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August, 2012. The current version is located on the Glenn Research Center intranet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html> Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes policy, procedures, and responsibilities for the investigation and remediation of uncontrolled releases of hazardous substances, as defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), into the environment from past operations at NASA Glenn Research Center (GRC). It conforms to the GRC Environmental Management System (EMS) as defined in Glenn Procedural Requirement (GLPR) 8553.1, and supports GRC environmental policy, which promotes pollution prevention, regulatory compliance, and continuous improvement. GRC employees and contractors at all levels who in any way participate in the development and execution of GRC action involving the handling, excavation, storage, transportation, and/or disposal of soils must follow the established policies, procedures, and guidelines outlined in this manual, Chapter 23, Handling, Reuse, and Disposal of Soil. Following the guidelines in this chapter will help achieve the GRC regulatory compliance objectives and targets. Achievement of these objectives and targets can be tracked through the audit results and Corrective and Preventive Action Report (CPAR) records.

2.0 APPLICABILITY

This chapter applies to all civil servant employees and onsite support service contractors within GRC and the Energy and Environmental Management Office (EEMO) who are responsible for implementation of CERCLA activities. It also applies to all civil servant employees and onsite support service contractors within GRC who assist the EEMO in implementing CERCLA activities through resource management, procurement, and funding.

3.0 BACKGROUND

Contamination of the environment by hazardous substances has been recognized as having the potential to negatively impact human health and the environment on a national level. To address this issue, Congress passed CERCLA (Public Law 96-510), commonly known as Superfund, in 1980. The primary goal of the act is to encourage the identification and remediation of sites contaminated with hazardous substances. Many states, including Ohio, have passed their own laws and regulations and established programs for ensuring conformance with these laws and regulations. CERCLA contains other provisions that extend beyond environmental remedial activities. However, the GRC CERCLA Environmental Remedial Activities Program, and therefore this chapter, addresses only the sections of CERCLA that apply to the investigation and remediation of uncontrolled releases of hazardous substances into the environment from past operations.

4.0 POLICY

It is GRC policy to

- Comply with state and Federal CERCLA requirements and the Ohio Environmental Protection Agency (OEPA) Director's Findings and Orders
- Identify and remediate CERCLA sites as rapidly as funds permit, in accordance with the terms and schedules noted in the OEPA Director's Findings and Orders, in a manner that is protective of human health and the environment
- Establish and maintain an interactive, mutually cooperative relationship with regulatory agencies
- Establish and maintain a positive reputation with the public

5.0 RESPONSIBILITIES

5.1 EEMO SHALL

- Provide program management and be responsible for the technical success of the program

- Provide project management, including determination of budgetary requirements, requests for funding, tracking of schedules and expenditures, and contractor oversight
- Provide technical evaluation and direction and be responsible for the technical success of the projects
- Negotiate and coordinate technical plans and operational matters with regulatory agencies and serve as the point of contact with these regulatory agencies
- Provide evaluation and comment on safety aspects of contractor Health and Safety Plans and monitor contractor compliance with GRC safety requirements during onsite field operations

5.2 Facilities Division (FD) SHALL

- Provide contractor services such as surveying and utility clearances, as requested by the EEMO and may provide other services at the request of the EEMO
- The Project Management Branch shall provide coordination of the project with GRC organizations and oversee field operations at GRC

6.0 REQUIREMENTS

6.1 Federal Requirements

CERCLA provides the requirements and basic framework for CERCLA remedial activities. The Superfund Amendments and Reauthorization Act (SARA) (Public Law 99-499) amended CERCLA in 1986 and added provisions to specify that Federal departments, agencies, and instrumentalities must comply with CERCLA in the same manner and to the same extent as nongovernmental entities. This includes all guidelines, rules, regulations, and criteria applicable to preliminary assessments (PAs), National Contingency Plan (NCP) evaluations, inclusion on the National Priorities List (NPL), and the conduct of remedial action (Sections 120(a)(2), (3), and (4)). The United States Environmental Protection Agency (USEPA) is required to compile information about contaminated sites at Federal facilities and to enter the information into the Federal Agency Hazardous Waste Compliance Docket. GRC is included on this docket.

6.2 State Requirements

The OEPA has a Memorandum of Agreement with USEPA that specifies the roles, responsibilities, and coordination of CERCLA responses in the state of Ohio. For sites that fail to be listed on the NPL (all sites scoring less than 28.5 on the hazard ranking scoring system), Ohio maintains authority and oversees all remedial actions. Since GRC site scores were well below 28.5, OEPA has authority and provides oversight at GRC.

6.3 Agreement Between OEPA and GRC

NASA and OEPA signed an agreement that was documented in the OEPA Director's Findings and Orders dated September 20, 1996. This agreement provides for investigation and cleanup of CERCLA sites at GRC at Lewis Field and payment of oversight costs to the state of Ohio. The agreement includes a generic statement of work that provides a detailed description of the required activities. All CERCLA remedial activities at GRC are being conducted in accordance with this agreement.

NASA and OEPA also signed an agreement that was documented in the OEPA Director's Findings and Orders dated November 6, 1997. This agreement provides a general framework for CERCLA activities at Plum Brook Station and payment of oversight costs to the state of Ohio. The agreement requires NASA to submit previous investigation reports to OEPA and states that OEPA will evaluate the reports and inform NASA of additional requirements, if any are determined to be necessary.

6.4 Procedural Requirements

The procedures required at GRC are complex and beyond the scope of this document. The state of Ohio has developed generic procedure documents. These procedure documents are referenced in the OEPA Director's Findings and Orders. They consist of the following:

- OEPA Generic Statement of Work Remedial Investigation/Feasibility Study (This is included in the Findings and Orders as Attachment A.)

- Model Statement of Work for the Remedial Design and Remedial Action (This is included in the Findings and Orders as Attachment B.)
- OEPA and USEPA Guidance Documents (This is included in the Findings and Orders as Attachment C.)
- Preferred Plans and Decision Documents (This is included in the Findings and Orders as Attachment D.)

In addition to the generic procedures, the USEPA and the OEPA have developed numerous policies and guidance documents covering many of the critical elements of CERCLA environmental remedial activities. Attachment C of the OEPA Director's Findings and Orders lists 60 state and Federal policies and guidance documents that the OEPA accepts and/or prefers.

7.0 RECORDS

The following records are all maintained by the EEMO.

- Work plans, sampling and analysis plans, health and safety plans, and quality assurance plans
- All engineering reports pertaining to work completed
- Monthly progress reports
- Original laboratory analysis and quality assurance data
- Background sampling reports referenced in CERCLA engineering plans and reports

8.0 REFERENCES

Document number	Document Name
Public Law 96-510	Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980
Public Law 99-499	Superfund Amendments and Reauthorization Act (SARA) of 1986
ORC 3734	Ohio Revised Code
OAC 3745	Ohio Administrative Code
N/A	OEPA's Directors Final Findings and Orders, November 6, 1997
GLM-QS-8500.1A	Environmental Programs Manual, Chapter 23, Handling, Reuse, and Disposal of Soil

APPENDIX A.—DEFINITIONS AND ACRONYMS

CERCLA.—Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Public Law 96–510), commonly known as Superfund.

CERCLA site/facility.—Any site where an uncontrolled release of a hazardous substance, pollutant, or contaminant exists or is threatened. Any building, structure, installation, equipment, pipe, well, pit, pond, impoundment, ditch, landfill, storage container, rolling stock, or any site or area where a hazardous substance has been deposited, stored, disposed of, or placed can be defined as a CERCLA site.

Corrective and Preventive Action Report (CPAR)

Energy and Environmental Management Office (EEMO)

Environmental Management System (EMS)

Facilities Division (FD)

Glenn Procedural Requirement (GLPR)

Glenn Research Center (GRC)

Hazardous substances.—Defined in Section 101(14) of CERCLA, as amended, United States Code (U.S.C.) 9601.

National Contingency Plan (NCP)

National Priorities List (NPL)

Ohio Environmental Protection Agency (OEPA)

Ohio Administrative Code (OAC)

Ohio Revised Code (ORC)

Preliminary assessment (PA)

Remedial activities.—All environmental activities undertaken at a CERCLA site including planning, reporting, investigation, remediation, and monitoring.

Remediation.—Any remedial activity directly related to the cleanup or control of hazardous substances in a manner that protects human health and the environment.

Superfund Amendments and Reauthorization Act (SARA)

United States Code (U.S.C.)

United States Environmental Protection Agency (USEPA)

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Chapter 19—Stratospheric Ozone Protection

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes policies and procedures pertaining to the procurement, use, handling, disposal, and overall management of ozone-depleting substances (ODSs), products made from or containing ODSs, and ODS substitutes at NASA John H. Glenn Research Center at Lewis Field and Plum Brook Station (GRC).

This chapter conforms to the GRC Environmental Management System (EMS) as defined in Glenn Procedural Requirement (GLPR) [8553.1](#) and supports GRC environmental policy, promoting pollution prevention, regulatory compliance, and continuous improvement.

2.0 APPLICABILITY

The [guidance requirements](#) provided in this chapter applies to all GRC employees (civil servants, support service contractors, tenant organizations, or other employees) who purchase, use, handle, manage, or dispose ODSs, products made from or containing ODSs, or ODS substitutes. This chapter is applicable to a lesser extent to other offsite entities involved with GRC activities.

3.0 BACKGROUND

Scientists worldwide have concluded that chlorofluorocarbons (CFCs) deplete the ozone layer. CFCs have been used in the manufacturing of many products, such as foam insulation, electronics equipment, refrigerators, and air conditioners. When allowed to escape, these chemicals drift some 30 miles above the Earth to the stratospheric ozone layer—a layer of gas that screens us from the Sun’s powerful ultraviolet (UV-B) radiation. In the ozone layer, CFCs break apart; this process releases chlorine, which then attacks ozone. A single chlorine atom can destroy more than 100,000 ozone molecules.

The ozone layer is being depleted over [Antarctica](#) and to a lesser extent over North America and Europe. A depleted ozone layer allows more UV-B radiation to reach Earth harming human, animal, and plant life in many ways. Scientists around the world agree that increased [UV-B radiation](#) could cause a rise in cases of skin cancer and cataracts and could damage important food crops and marine ecosystems.

The United States and over 190 other countries are working together to protect the ozone layer by phasing out the production of ODSs in developed countries. In addition, the [Clean Air Act of 1990](#) contains requirements that ban the release of refrigerants during the service, maintenance, and disposal of air conditioning and refrigeration equipment and includes requirements for labeling products that are manufactured with or contain CFCs. Technicians must be certified in the proper use of the equipment and are required by law to use approved recovery or recycling equipment.

4.0 POLICY

It is GRC policy to phase out the use of all ODSs and products made from or containing ODS in all but critical applications. For the purpose of this policy, critical applications are those that are essential to the mission and have no proven, available, or cost-effective market alternatives.

5.0 RESPONSIBILITIES

5.1 All Employees (Civil Service, Support Service Contractor, Tenant Organization Employees, or Other) Shall

- Seek replacements for ODS materials in their appliances and/or operations and evaluate their use of ODS for criticality with a life cycle assessment as described in Chapter [15.9](#) of the GRC Environmental Programs Manual. A waiver, in lieu of a life cycle assessment (LCA), may be requested from the chapter lead.

- Ensure that appliances and/or operations that use ODSs or an approved substitute receive proper maintenance to prevent the release of these materials to the environment.
- Notify the chapter lead of any ODS leaks from appliances with a 50 lb or greater refrigerant charge.
- Obtain approvals from the Safety, Health and Environmental Division (SHED) Operations Team Chemical Management (CM) staff for ODS acquisitions as outlined in Chapter 15 of the GRC Environmental Programs Manual.
- Coordinate refrigerant disposals with the SHED Operations Team Waste Management (WM) as outlined in Chapter 5 of the GRC Environmental Programs Manual.

5.2 SHED Shall

Operations Team, CM

- Approves or disapproves the procurement of ODSs by reviewing for release all hazardous chemical purchase requisitions

Operations Team, Pollution Prevention/Sustainability Committee

- Approves or disapproves the criticality determinations
- Provides support with Chapter 9, Life Cycle Assessment, in the Environmental Programs Manual
- Provides support and technical information on regulations regarding ODS and their substitutes

Operations Team, WM

- Oversees or handles the disposal of refrigerants at GRC

Facility Team, Air Pollution Control

- Oversees the Stratospheric Ozone Protection Program
- Processes waiver requests

Plum Brook Team

- Approves or disapproves the procurement of ODS by reviewing for release all hazardous chemical purchase requisitions.
- Provides support with Chapter 9, Life Cycle Assessment, in the Environmental Programs Manual
- Provides support and technical information on regulations regarding ODSs and their substitutes

5.3 Facilities Division and Plum Brook Management Office Shall

- Maintain a preventive maintenance program that will ensure compliance with 40 Code of Federal Regulations (CFR) 82.156 with regard to leak repairs in appliances with a 50 lb or greater ODS charge
- Select and monitor certified contractors to service industrial heating, ventilating, and air conditioning (HVAC), refrigerant systems, and other related equipment
- Verify the use of Environmental Protection Agency (EPA)-certified refrigerant technicians using certified refrigerant containment recovery equipment during service, repair, removal, or recovery of industrial appliances to prevent the release of refrigerants to the environment as required by 40 CFR Part 82. These certifications may be tracked in NASA SATERN Program through the Training Office.
- Provide support and oversight for refrigerant reclamation and recovery
- Coordinate any industrial refrigerant disposals with the WM

5.4 Logistics and Technical Information Division Shall

- Verify the use of EPA-certified motor vehicle air conditioning (MVAC) technicians using certified refrigerant containment recovery equipment during service, repair, removal, or recovery of MVAC systems to prevent the release of refrigerants into the environment, as required by 40 CFR Part 82
- Provide support and oversight for refrigerant reclamation and recovery
- Coordinate any MVAC refrigerant disposals with the WM

6.0 REQUIREMENTS

6.1 Interfacing With Regulatory Agencies

SHED ~~shall be~~ is the official point of contact with regulatory agencies in regard to ODS.

6.2 Purchases of ODSs and Products Made From or Containing ODS Materials

Any purchase ~~must~~ shall comply with the requirements of 48 CFR Part 1, 40 CFR Part 82, and Executive Orders 13423 and 13514

6.3 Certified Technician Training

A certification from an EPA-approved training program as outlined in 40 CRF 82 is required of all technicians. These certifications may be tracked in NASA SATERN Program through the Training Office.

6.4 Certified Refrigerant Equipment

A certification in accordance with 40 CRF 82 is required of all refrigerant recovery and recycling equipment. These certifications may be tracked in NASA SATERN Program through the Training Office.

6.5 Refrigerant Conservation, Containment, and Recovery Requirements

Any leak discovered in an appliance with a capacity of 50 lb or more ~~must~~ shall be addressed as outlined in 40 CFR 82.156 (i) (9).

Prior to appliance disposal (except for MVAC and MVAC-like equipment and small appliances) a technician ~~must~~ shall evacuate the refrigerants, as specified in 40 CFR 82.156 (a).

Prior to opening any appliances (except for MVAC) for maintenance, service, or repair, a technician ~~must~~ shall evacuate the refrigerant in either the entire unit or the part to be serviced as specified in 40 CFR 82.156 (a).

7.0 RECORDS

- Preventive maintenance service records for appliances with a capacity of 50 lb or more ~~shall be~~ — Maintained by Facilities Division or contract organizations.
- Certified MVAC technicians list ~~shall be~~ — Maintained by Logistics and Technical Information Division or contract organizations.
- ODS inventory, technician qualification certificates, and maintenance logs ~~shall be~~ — Maintained by Plum Brook Management Office.

8.0 REFERENCES

Document	Name
42 USC Title 42, Chapter 85, Subchapter VI	Stratospheric Ozone Protection
40 CFR Part 82	Protection of Stratospheric Ozone
48 CFR Part 1	Federal Acquisition Regulation System
Executive Order 13423	Strengthening Federal Environmental, Energy, and Transportation Management
GLM-QS-8500.1A	Environmental Programs Manual, Chapter 15, Acquisition of Hazardous Chemicals and Materials
GLM-QS-8500.1A	Environmental Programs Manual, Chapter 5, Management of Hazardous Materials and Waste for Reuse, Recycling, or Disposal

~~Safety and Mission Assurance Directorate (SMAD)
Safety, Health and Environmental Division (SHED)
Program Lead: Christie Myers~~

~~Web-Curator: Sandra Jacobson, SAIC~~
~~Revision Date: November 2009~~

APPENDIX A.—DEFINITIONS AND ACRONYMS

Appliance.—Any device that contains and uses a Class I or II ozone-depleting substance as a refrigerant.

Chemical Management (CM)

Chlorofluorocarbon (CFC)

Class I ODS.—A chemical with an ozone-depleting potential of 0.2 or greater. Some examples of chemicals in this category include trichlorofluoromethane (R-11), dichlorodifluoromethane (R-12), chlorotrifluoromethane (R-13), 1,1,2-trichlorotrifluoroethane (R-113), and 1,1,1-trichloroethane (NA 500).

Class II ODS.—A chemical with an ozone-depleting potential less than 0.2. Some examples of chemicals in this category include monochlorodifluoromethane (R-22), dichlorotrifluoroethane (R-123), dichlorofluoroethane (R-141b), dichloropentafluoropropane (R-225ca), and dichloropentafluoropropane (R-225cd).

Code of Federal Regulations (CFR)

Environmental Protection Agency (EPA)

Glenn Procedural Requirement (GLPR)

Glenn Research Center (GRC)

Heating, ventilating, and air conditioning (HVAC)

Life cycle assessment (LCA).—Comprehensive examination of a product's environmental and economic aspects and potential impacts throughout its lifetime, including raw material extraction, transportation, manufacturing, use, and disposal.

Motor vehicle air conditioning (MVAC) system.—Mechanical vapor compression refrigeration equipment used to cool the driver's or passenger's compartment of any motor vehicle. MVAC-like systems include similar systems up to a charge of 20 lb of refrigerant.

Ozone.—A bluish gas composed of molecules made up of three oxygen atoms. Nearly 90 percent of the Earth's ozone is in the stratosphere or ozone layer. This stratospheric ozone shields the Earth from harmful ultraviolet radiation produced by the Sun with wavelengths from 280 to 320 nanometers. Earth's remaining ozone or ground-level ozone is harmful to breathe and can damage lungs, trees, crops, and other materials.

Ozone-depleting potential (ODP).—The ratio of the impact on ozone of a chemical compared to the impact of a similar mass of trichlorofluoromethane.

Ozone-depleting substance (ODS).—A compound that contributes to stratospheric ozone depletion. ODSs are generally very stable in the troposphere and only degrade under intense ultraviolet light in the stratosphere. When they break down, they release chlorine or bromine atoms, which then deplete ozone. For regulatory purposes, ODS are listed or referenced in the applicable regulatory text. United States EPA maintains an up-to-date listing of ODS by class; Class I ODS is at <http://www.epa.gov/ozone/ods.html> and Class II ODS is at <http://www.epa.gov/ozone/ods2.html>.

Refrigerant.—Any Class I or II ozone-depleting substance or approved substitute with venting restrictions. This definition is inclusive of all usage categories.

Safety, Health and Environmental Division (SHED)

Safety and Mission Assurance Directorate (SMAD)

Small appliance.—Any appliance that is fully manufactured, charged, and hermetically sealed in a factory with 5 lb or less of a Class I or II ozone-depleting substance used as a refrigerant.

Technician.—Any person who performs installations, maintenance, service, repair, or disposal that could release refrigerants from appliances into the atmosphere.

Ultraviolet (UV-B)

Waste Management (WM)

APPENDIX B.—FORMS

Class I or II Ozone-Depleting Chemical Purchase/Use Waiver Request Form

This form is used to request Class I or II ozone-depleting chemicals whose use is not concurrent with the phase out plan or use guidelines detailed in the Glenn Research Center, Environmental Programs Manual, Chapter 19, Stratospheric Ozone Protection.

Requestor's Name: _____ Date: _____
Organization: _____ Phone: _____

Chemical Requested: _____
Class and Amount: _____
(See Title VI of the Clean Air Act Amendments of 1990 for chemical listings)
Purpose for Material: _____
Project Name: _____
Equipment Location: _____

Is a substitute material for this chemical available? ___ YES ___ NO

Please explain the need for the requested material. Please include any extenuating circumstances:

Please detail the phase out plan:

Equipment Description: Installation Date _____ Property ID _____
Make _____ Model _____

This section to be completed by the Safety, Health and Environmental Division (SHED)

Is the phase out plan adequate? ___ YES ___ NO
If NO, please attach revised plan
Is this Waiver being granted? ___ YES ___ NO
How long is this purchase/use waiver valid? _____

Signature of Requestor: _____ Date: _____

Signature of Stratospheric Ozone _____ Date: _____
Protection Chapter Lead:

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Chapter 20—Underground Storage Tanks

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter sets forth Glenn Research Center (GRC) policies and requirements for the design, construction and operation, as well as maintenance, monitoring, and reporting for underground petroleum storage tanks.

2.0 APPLICABILITY

This chapter is applicable to all GRC personnel affiliated with the underground petroleum storage tanks at GRC and to any NASA-controlled, Government-owned facilities associated with GRC. This includes, but is not limited to, fuel delivery personnel, fuel users, general tank maintenance personnel, and regulatory inspectors. Underground storage tanks (USTs) are those with 10 percent or more of their volume underground, including pipes (see Appendix A).

3.0 BACKGROUND

Until the mid-1980s, most USTs were made of bare steel, which is likely to corrode over time and allow UST contents to leak into the environment. The greatest potential hazard from a leaking UST is that its contents (petroleum or other hazardous substances) can seep into the soil and contaminate groundwater, the source of drinking water for nearly half of all Americans. Subtitle I was added to the Resource Conservation and Recovery Act (RCRA) through the Hazardous and Solid Waste Amendments. This created a Federal program to regulate USTs containing petroleum and hazardous chemicals to limit corrosion and structural defects and thus minimizing future tank leaks.

4.0 POLICY

It is GRC policy to follow the requirements and recommendations of all relevant Federal, state, and local regulations applicable to USTs. The complete regulatory texts should be consulted for further details. The following are the authorities that presently regulate USTs at GRC and are incorporated here by reference:

1. Bureau of Underground Storage Tank Regulations (BUSTR) Ohio Administrative Code (OAC) Chapter 1301:7-9 Underground Storage Tanks and OAC Chapter 1301:7-7-28 Flammable and Combustible Liquids
 - a. Ohio codes relevant to USTs
2. National Fire Protection Association (NFPA) Codes 30, 30A, and 47
 - a. Code requirements for flammable and combustible liquids, motor fuel dispensing facilities and repair garages, and standard for aircraft fuel servicing
3. Occupational Safety and Health Administration (OSHA), Hazard Communication Standard 29 Code of Federal Regulations (CFR) 1910.1200
 - a. Mandates that employees have both a need and a right to know the hazards and identities of the chemicals they are exposed to when working. Employees also need to know what protective measures are available to prevent adverse effects.
 - b. Applicable to any chemical that could constitute a health or physical hazard to employees in the workplace.
4. Resource Conservation and Recovery Act, Subtitle I, Subchapter IX 42 United States Code (U.S.C.) Sections 6901-6992
 - a. Regulation of USTs

5. Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks 40 CFR Part 280, 40 CFR Part 281
 - a. The Federal regulations concerning USTs

5.0 RESPONSIBILITIES

5.1 Air Programs Manager

The Air Programs Manager is responsible for GRC compliance with the Title V Permit, and ensures all sources of air emissions are documented and permitted as required.

5.2 All GRC Personnel

Any person who discovers a fuel spill at GRC shall immediately notify Emergency Dispatch on a GRC inhouse line (911). If using a cellular phone, dial 216-433-8888 at Lewis Field and 419-621-3222 at Plum Brook Station.

5.3 Authority Having Jurisdiction

The authority having jurisdiction (AHJ) is responsible for providing review and approval on changes made to facilities and systems that affect fire protection and life safety, including model building and fire code (International Code Council) and local (Ohio Fire Code) requirements. The AHJ has the authority to enforce the fire code where these requirements originate.

5.4 Human Capital Development Branch Chief

The Human Capital Development Branch Chief is responsible for the maintenance of training records of GRC personnel for SATERN-based training sessions.

5.5 Chemical Management Lead

The Chemical Management Lead ensures that the requirements of 29 CFR 1910.1200, the Hazard Communication Standard, and the policies and procedures of GRC are met with regards to the bulk storage of oil of any kind or in any form at either Lewis Field or Plum Brook Station.

5.6 Civil Systems Manager

The Civil Systems Manager designs underground storage facilities at GRC.

5.7 Fleet Manager

The Fleet Manager records, monitors, and reports on annual fleet fuel consumption totals for Lewis Field and Plum Brook Station.

5.8 Fuel Distribution Supervisor (Lewis Field) and the Designated Support Service Contractor (Plum Brook Station)

The Fuels Distribution Supervisor verifies that employees who are involved in the transfer of fuel at GRC comply with Glenn Work Instruction number, GLWI-CO-6000.001, Revision E. The supervisor also maintains the daily records of fuel usage, delivery, and consumption at Lewis Field and Plum Brook Station. Also, the supervisor conducts the ordering and delivery of fuels to all UST systems at GRC, except for those located at Buildings 12 and 500 at Lewis Field.

5.9 UST Fuel User

At Lewis Field and Plum Brook Station, the fuel user is responsible in understanding and following all warning and safety precautions when refueling Government or contractor fleet vehicles and equipment. Fuel users are required to report spills to their respective Center dispatch. If spill absorbents are used, they should be collected and disposed of to the proper container or given to personnel in Waste Management for proper disposal.

5.10 UST Program Leads

At either Lewis Field or Plum Brook Station, the UST Program Lead is responsible for administering and enforcing all applicable regulations. The SHED Facilities Team manages the UST Program at Lewis Field. The SHED Plum Brook Station team manages the UST Program at Plum Brook Station with assistance from the SHED Facilities Team.

5.11 UST Operators

The UST Operator is responsible for ensuring UST personnel have completed the annual SATERN Training, inspecting the UST System before, during, and after fuel use, and providing the funding support in the completion of annual inspections, repairs, modifications, spill kit replenishment, and costs of associated permits. See Appendix B for listing of these operators.

5.12 Waste Management Program Lead (Lewis Field) and the Designated Support Service Contractor (Plum Brook Station)

The Waste Management Program Lead coordinates the remediation or removal and disposal of contaminated water or soil related to USTs.

6.0 REQUIREMENTS

The following requirements apply to both Lewis Field and Plum Brook Station, unless otherwise noted.

6.1 Annual Registration (1301:7-9-04)

Annual registration is due no later than the first day of July of each subsequent year for each facility containing a UST system. The Fire Marshal prescribes the annual registration application at least 30 days prior to the registration deadline of each year by electronic notification. SHED will complete the annual registration and update onsite certificates.

6.2 Annual Training (40 CFR 112)

All personnel who utilize, delivery, and store petroleum-based products are required to complete the following SATERN courses annually:

- Course number GRC-006-08 for Spill Prevention Control and Countermeasures

Highly recommended courses include

- Course number GRC-008-08 for Underground Storage Tanks
- Course number GRC-007-08 for Storm Water Pollution Prevention

By request, all three training sessions may be provided in class for those personnel without computer access.

6.3 Certified UST Inspections (1301:7-9-11)

All UST Systems including those not regulated by BUSTR, are required to be inspected annually by a third-party certified inspector. The state Fire Marshal's office is scheduled to complete inspections every 3 years. SHED is the point of contact for the Fire Marshal. UST tank operators (see Appendix B) and their respective organizations are responsible for funding these inspections and subsequent repairs and/or upgrades warranted from those inspections.

6.4 Permits (OAC 3745.77, 1301:7-9-10)

Major repairs, modifications, or a change in service of a UST requires application of a permit through the AHJ prior to performing work. All permitted work shall be overseen by a certified UST installer and a certified UST inspector.

Changes in use or fuel type, including usage records of current systems, shall be coordinated with the Air Programs Manager. SHED will assist in obtaining these permits.

6.5 Recordkeeping (1301:7-9)

All records associated to repairs, upgrades, modifications, permits, inspections, and installation shall be retained for the operational life of the UST system. Compliance and performance requirements are documented using the Fire Marshal's prescribed form. SHED will maintain these records.

6.6 Reporting Requirements (1301:7-9-03, 40 CFR 112)

Any Veeder Root alarm either from a sensor in any containment system, the level probe readings, and/or interstice shall be evaluated within 24 hr by SHED to confirm proper operation or to confirm the presence of a release. Onsite personnel shall notify the respective UST point-of-contact or program lead for Lewis Field and Plum Brook Station in case of an alarm. Releases of 25 gallons or more, or releases that escape the containment system and/or enter the

environment are reported by SHED to the required agencies (i.e., BUSTR, Brook Park Fire Department, and Ohio Environmental Protection Agency).

6.7 Superfund Amendments and Reauthorization Act (SARA) Reporting

The SHED Operations Team annually requests hazardous material information from the UST program lead for the Emergency Planning and Community Right-to-Know Act (EPCRA).

6.8 UST Operators and Fuel Delivery (1301:7-9-08)

UST operators and fuel delivery personnel are required to do the following:

- Ensure sufficient spill kit supplies are available prior to initiating fuel deliveries. See Appendix C for the recommended contents for the spill kits located at the UST sites
- Establish a site designee to be onsite in vicinity of overfill alarms and tank connections during all fuel deliveries into a UST
- Visually inspect spill containment equipment after each delivery and promptly have any water, regulated substance, or debris removed and properly disposed
- Report spills or releases by dialing 911 on an internal NASA phone or 216-433-8888 at Lewis Field or 419-621-3222 at Plum Brook Station on a personal cell phone
- Immediately cease refueling of a tank in the event the overfill protection alarm is triggered
- Contact the SHED UST point-of-contact immediately when the Veeder Root Monitoring Station signals an Alarm or Warning alert
- Notify SHED of a change in service or change in fuel type to be stored in the UST

6.9 UST System Testing and Release Detection (1301:7-9-08)

All UST systems including interstitial sensors, sump sensors, level probes, and exterior alarms shall be annually evaluated and tested by certified personnel. Tank testing shall be completed per Federal regulations and after all major repairs, upgrades, and modifications. Pipe testing shall have applicable testing completed per the type and location of the piping.

7.0 RECORDS

- Annual UST Registration.—Completed and filed by the UST Lead on an annual basis per BUSTR requirements.
- Closure reports for removed or abandoned USTs.—Retained by the UST Lead for 3 years after receiving a No Further Action (NFA) letter.
- Records of repairs, modifications, inspections, and tank testing.—Retained by the UST Lead for the life of the tank.
- Records of fuel usage, deliveries, and fuel consumption at GRC.—Retained by the Logistics and Technical Information Division (LTID) and Fleet Manager.
- Records of routine maintenance checkups and repairs.—Retained by the respective support service contractor for Lewis Field and Plum Brook Station.
- Tank Permits for removal, repair, modifications, closure, and/or new installation.—Retained by the UST Lead for the life of the tank or 3 years from receiving an NFA letter from BUSTR.
- UST Training Attendance Sheets and Records.—In-class trainings will be retained by the UST Lead. SATERN trainings will be retained by the Human Capital Development Branch.
- Veeder Root 30-Day Interstitial Monitoring Printouts.—Retained at Plum Brook Station and the UST Lead at Lewis Field for the life of the tank.

8.0 REFERENCES

Document Number	Document Name
40 CFR Part 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
ANSI B31.3-2002	American National Standard Institute (ANSI) Standard Code for Pressure Piping
American Petroleum Institute (API) 1604-1996	Closure of Underground Petroleum Storage Tanks
API 1615-2001	Installation of Underground Petroleum Storage Tanks
API 1626-2000	Standard for storing and handling ethanol and gasoline-ethanol blends at distribution terminals and service stations
API 1627-2000	Standard for the storage and handling of gasoline-methanol blends at distribution terminals and service stations
OAC 1301:7	Ohio Administrative Code (OAC), Division of State Fire Marshal
OAC 3745.77	NASA Glenn Research Center Title V Permit information
NFPA 30	Flammable and Combustible Liquids Code
NFPA 30A	Motor Fuel Dispensing Facilities and Repair Garages
NFPA 407	Industry standard for aircraft fuel, refueling, and servicing
Underwriters Laboratory (UL 971)	Nonmetallic Underground Piping for Flammable Liquids
UL 1316	Standard for Glass-Reinforced Plastic Underground Storage Tanks for Petroleum Products

APPENDIX A.—DEFINITIONS AND ACRONYMS

Ancillary equipment.—Any device including, without limitation, such devices as piping, fittings, flanges, valves, and pumps used to distribute, meter, or control the flow of regulated substances to and from an underground storage tank.

American National Standard Institute (ANSI)

American Petroleum Institute (API)

Authority having jurisdiction (AHJ)

Bureau of Underground Storage Tank Regulations (BUSTR)

Certified Installer.—Individual certified by the Fire Marshal under the requirements of rule 1301:7-9-11 of the Ohio Administrative Code to supervise the installation of, performance of major repairs onsite to, closure-in-place of, removal of, performance of, modifications of, placing out-of-service for more than 90 days of, change in service of, or the performance of evaluations of leak detection equipment on underground storage tank systems.

Certified Underground Storage Tank Inspector.—Individual certified by the Fire Marshal under the requirements of rule 1301:7-9-11 of the Ohio Administrative Code to inspect the installation of, performance of major repairs onsite to, closure-in-place of, removal of, performance of, modifications of, placing out-of-service for more than 90 days of, change in service of, or the performance of evaluations of leak detection equipment on underground storage tank systems.

Code of Federal Regulations (CFR)

Corrective action.—Any action necessary to protect human health and the environment in the event of a release of petroleum into the environment, including without limitation, any action necessary to monitor, assess, and evaluate the release.

Emergency Planning and Community Right-to-Know Act (EPCRA)

Fuel user.—Those personnel at either Lewis Field or PBS who refuel Government- or contractor-owned fleet vehicles and equipment with fuel from underground storage tanks. It also includes those personnel whose testing rigs are tied into utilizing fuels from underground storage tanks.

Glenn Research Center (GRC)

Glenn Work Instruction (GLWI)

Heating fuel.—Petroleum that is Numbers 1, 2, 4-Light, 4-Heavy, 5-Light, 5-Heavy, and 6 technical grades of fuel oil. Typically used in the operation of heating equipment, boilers, or furnaces.

Logistics and Technical Information Division (LTID)

Maintenance.—The normal operational upkeep to prevent an underground storage tank system from releasing product.

Major repair.—The restoration, upgrading, or modification of a tank or an underground storage tank system component that has caused a release of a product from the underground storage tank system. It does not include routine maintenance or normal operational upkeep to prevent an underground storage tank system from releasing a product.

Modification.—Work performed on an underground storage tank system component that has not leaked such as adding, altering, or retrofitting the following:

- a. Underground storage tanks and any components fixed to underground storage tank openings
- b. Containments located over underground storage tanks, under dispensers, or at intermediate points excluding spill prevention equipment
- c. Piping components that routinely contain regulated substances up to and including shear valves at the dispenser
- d. Underground vent lines excluding stage 3 vapor recovery components

- e. Flexible connector lines
- f. Underground storage tank lining components
- g. Release detection equipment

Motor fuel.—Petroleum or a petroleum-based substance that is motor gasoline, aviation gasoline, numbers 1 or 2 diesel fuel, or any grade of gasoline, and is typically used in the operation of a motor engine.

National Fire Protection Association (NFPA)

No Further Action (NFA).—Official regulatory affirmation that a site adequately protects human health and the environment for the intended use of the site. The letter received often notes the end of corrective actions and may document any property restrictions.

Occupational Health and Safety Administration (OSHA)

Ohio Administrative Code (OAC).—Compilation of general and permanent state regulations that have the force of the law. Administrative codes present a collated version of the regulation, incorporating all additions and deletions.

Operational Life.—The period beginning when installation of the underground storage tank system has commenced until the time the underground storage tank is properly closed under 1301:7-9-02 of the Administrative Code.

Petroleum.—Includes crude oil or any fraction thereof that is a liquid at the temperature of 60 °F and the pressure of $14\frac{7}{10}$ pounds per square inch absolute. It includes, without limitation, motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

Regulated substance.—Any hazardous substance and/or petroleum product.

Release.—Any spilling, leaking, emitting, discharging, escaping, leaching, or disposing of a petroleum product from an underground storage tank system into ground water, a surface water body, and subsurface soils or otherwise into the environment.

Repair.—Action to restore a tank or underground storage tank system component that has caused a release of product from the underground storage tank system.

Resource Conservation and Recovery Act (RCRA)

Routine maintenance or normal operational upkeep.—Work performed to maintain or to prevent an underground storage tank system from releasing a regulated substance. Work on the following components shall constitute routine maintenance or normal operational upkeep on existing UST systems provided the component has not caused a leak:

- a. Drop tubes
- b. Overfill containment devices
- c. Spill prevention equipment
- d. Fill caps and adapters
- e. Cathodic protection components
- f. Stage 1 vapor recovery components
- g. Submersible pump components provided that no product lines are disconnected
- h. Individual leak detection monitoring units, probes, sensors, or line leak detectors that are maintained with like components

Safety, Health and Environmental Division (SHED)

Spill.—A release resulting from improper dispensing practices to an underground storage tank system including, without limitation, the disconnecting of a delivery hose from a tank's fill pipe before the hose has drained completely.

Spill prevention equipment.—Spill containment manhole or spill bucket installed at a fill pipe that catches and holds drips and spills of regulated substances that can occur when a delivery hose is removed from the fill pipe after delivery of a regulated substance to an underground storage tank.

Superfund Amendments and Reauthorization Act (SARA)

System for Administration, Training, and Educational Resources at NASA (SATERN)

Underwriters Laboratory (UL)

Upgrade.—The addition or retrofit of a system such as cathodic protection, lining, or spill and overfill controls to improve the ability of an underground storage tank to prevent the release of product.

Underground storage tank (UST).—One or any combination of tanks, including the underground piping connected thereto, that are used to contain an accumulation of regulated substances the volume of which, including the volume of the underground pipes connected thereto, is 10 percent or more beneath the surface of the ground. The term does not include any of the following:

- i. Tanks used for storing heating fuel for consumptive use on the premise where stored
- j. Surface impoundments, pits, ponds, or lagoons
- k. Storm or waste water collection systems
- l. Flow-through process tanks
- m. Storage tanks located in underground areas, including without limitation, basements, cellars, mine workings, drifts, shafts, or tunnels, when the tanks are located on or above the surface of the floor
- n. Septic tanks
- o. Liquid traps or associated gathering lines directly related to oil or gas production and gathering questions

Underground storage tank operator.—The person or organization who requests fuel to be delivered to an underground petroleum storage tank for either Center-wide or individual organizational use.

Underground storage tank system.—Underground storage tanks and the connected underground piping, underground ancillary equipment, and containment system, if any.

United States Code (U.S.C.)

Veeder Root Alarm.—Light and horn alarms triggered at an underground storage tank site when a potential overfill of the tank is about to or has occurred. These alarms are also triggered when leak sensors in sumps or the double wall of the tank detect the presence of water or fuel. All alarms are monitored by the Veeder Root Monitoring Station located at each underground storage tank site and remotely in Building 6.

APPENDIX B.—TANK TABLES

TABLE B.1.—LEWIS FIELD UNDERGROUND STORAGE TANKS

Tank no.	Tank location	Capacity, gal	Fuel type	BUSTR facility ID	Operator contact	Org. Code
101	Bldg. 125	20,000	Jet fuel	18002650	Dennis Dicki	FTO
102	Bldg. 125	20,000	Jet fuel	18002650	Dennis Dicki	FTO
103	Bldg. 102, Site 17	20,000	Jet fuel	18002694	Gwynn Severt	FTA
104	Bldg. 102, Site 17	20,000	Jet fuel	18002694	Gwynn Severt	FTA
105	Bldg. 102, Site 17	10,000 ^a	Jet fuel	18002694	Gwynn Severt	FTA
106	Bldg. 102, Site 17	10,000 ^a	Empty	18002694	Gwynn Severt	FTA
107	Bldg. 24 North	4,000	Jet fuel	18007803	Dennis Fox	RXD
108	Bldg. 24 South	6,000	Jet fuel	18007803	Dennis Fox	RXD
109	Bldg. 104	10,000	E-85 Ethanol	18002632	Sue Kraus	CO
110	Bldg. 104	10,000	Unleaded gasoline	18002632	Sue Kraus	CO
111	Bldg. 104	6,000	B-20 biodiesel	18002632	Sue Kraus	CO
112	Bldg. 131	25,000	Jet fuel	18002636	Robert Schutte	FA
113	Bldg. 114	1,000	Diesel	18002667	Jim Roeder	FTD
115	Bldg. 500	10,000	No. 2 heating oil	Not required ^c	Dale Wiersma	FDO
116	Bldg. 12	10,000 ^b	No. 2 heating oil	Not required ^c	Dale Wiersma	FDO
117	Bldg. 12	10,000 ^b	No. 2 heating oil	Not required ^c	Dale Wiersma	FDO

^aTank is part of a single tank that has been baffled.

^bTanks are part of a single tank with separate compartments piped together to allow transfer of fuel to each other.

^cTanks used for storing heating fuel used on the premises are exempt to BUSTR Registration.

TABLE B.2.—PLUM BROOK STATION UNDERGROUND STORAGE TANKS

Tank no.	Tank location	Capacity, gal	Fuel type	BUSTR facility ID	Operator contact	Org. Code
201	Bldg. 7132	8,000	Unleaded gasoline	22007804	Tom Keating	H - FDO
202	Bldg. 7132	8,000	Diesel	22007804	Tom Keating	H - FDO

APPENDIX C.—SPILL KIT SUPPLIES

TABLE C.1.—RECOMMENDED SUPPLIES FOR SPILL KITS^a

Type of Spill Supply	Amount	Comments
Bundle of universal spill pads	100	For all types of liquids
Bundle of oil-only pads	100	These pads attract oils and fuels only
3-ft Universal Socks	6	For all types of liquids
10-ft Universal Socks	3	For all types of liquids
Spill stopper drain cover	1	Replacements should cover the largest drain of concern

^aSpill kit type is a large, rectangular four-wheeled container.

Additional supplies acceptable for a specific site may include the following:

- Drip pans for aboveground piping leaks
- Drain plugs for smaller drains and temporary sealing of drains
- Spill-absorbent pillows
- Loose absorbent such as clay or ash
- Clear bags for absorbent collection and disposal

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Chapter 21—Pest Control

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes policies and procedures for dealing with the chemical and biological control of pests at the NASA Glenn Research Center (GRC) Lewis Field and Plum Brook Station.

2.0 APPLICABILITY

The guidance provided in this chapter applies to all employees (civil servants, support service contractors, tenant organizations, or other employees) who are involved in the management of pests at GRC or at any NASA-controlled, Government-owned facilities associated with GRC.

3.0 BACKGROUND

The Federal Government first regulated pesticides when Congress passed the Insecticide Act of 1910. This law was intended to protect farmers from adulterated or misbranded products. Congress broadened the Federal Government's control of pesticides by passing the original Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1947. FIFRA required the Department of Agriculture to register all pesticides prior to their introduction in interstate commerce. A 1964 amendment authorized the Secretary of Agriculture to refuse registration to pesticides that were unsafe or ineffective and to remove them from the market. In 1970, Congress transferred the administration of FIFRA to the newly created Environmental Protection Agency (EPA). This initiated a shift in the focus of Federal policy from the control of pesticides for reasonably safe use in agricultural production to control of pesticides to reduce unreasonable risks to man and the environment. This new policy focus was expanded by the passage of the Federal Environmental Pesticide Control Act of 1972 (FEPCA), which amended FIFRA by specifying methods and standards of control in greater detail. Subsequent amendments have clarified the duties and responsibilities of the EPA.

Under FIFRA, no one shall sell, distribute, or use a pesticide unless it is registered by the EPA. Registration includes approval by the EPA of the pesticide's label, which must give detailed instructions for its safe use. The EPA must classify each pesticide as either "general-use," "restricted-use," or both. General-use pesticides may be applied by anyone, but restricted-use pesticides shall only be applied by certified applicators or persons working under the direct supervision of a certified applicator. Applicators are certified by the State of Ohio Department of Agriculture.

4.0 POLICY

It is a goal of GRC to exercise integrated pest management practices whenever pest control is necessary. It is a goal of GRC to minimize the storage, use, and disposal of pesticides onsite. Pesticide use at GRC shall be exercised with a goal of minimizing both human exposure and adverse environmental impacts. GRC shall store, apply, transport, and dispose of pest control materials according to all applicable Federal, state, and local statutes.

5.0 RESPONSIBILITIES

5.1 Lewis Field's Facilities Operations and Maintenance Contractor's Business Management/Site Safety Manager

- Oversees the pest control program at Lewis Field
- Responsible for storing, mixing, transporting, and applying pesticides
- Verifies the appropriate training of pesticide applicators and maintains pesticide applications, training records, and records of dates of physical examinations
- Notifies Safety, Health and Environmental Division (SHED) Operations Team industrial hygienists prior to using any new restricted-use pesticide or herbicide onsite

5.2 Plum Brook Station Code H Support Service Contractor

- Manages the pest control program at Plum Brook Station
- Responsible for storing, mixing, transporting, and applying pesticides
- Verifies the appropriate training of pesticide applicators and maintains pesticide applications, training records, and records of dates of physical examinations

5.3 FIFRA Program Lead

- Audits the pesticide application program for compliance with FIFRA in December of every year
- Notifies the National Environmental Policy Act (NEPA) Program Lead of any significant plans to alter the pesticide or herbicide application program

5.4 SHED Operations Team Hygienist (Lewis Field) and the SHED Plum Brook Station Team

- Review the potential human health impacts of proposed new use of registered pesticides at GRC
- Advise on personal protective equipment

5.5 NEPA Program Lead

- Analyzes proposed alterations to the pesticide or herbicide application program for environmental impacts
- Recommends and advises actions that will lead to achieving goals and regulatory compliance

5.6 The Facilities Operations and Maintenance Contractor's Contracting Officer's Technical Representative (COTR) (Lewis Field) and the Code H COTR (Plum Brook Station)

- Responsible for issuing work orders to their contractor for pesticide applications

5.7 Pesticide Applicator

- Completes records of pesticide applications after each application of herbicides or pesticides (The records shall include the applicator's name, date, area of application, product applied, equipment used, and weather conditions.)
- Follows the product's manufacturer's usage instructions

6.0 REQUIREMENTS

6.1 Federal Pesticide Procedural Requirements (*40 Code of Federal Regulations (CFR) Parts 150 to 189 and 7 United States Code (U.S.C.), section 136 et seq.*)

The Federal Pesticide Procedural Requirements form the basis for Federal pesticide legislation that addresses the manufacture, transport, application, storage, and disposal of pesticides. As it applies to GRC, the requirements mandate that pesticides be applied, stored, internally transported, and disposed of as indicated on the products' labels. Pesticides shall be stored indoors in a locked, gated area. Liquid pesticides shall be stored in a flammable liquid cabinet with secondary containment. Mixing of pesticides shall be performed in an area that can contain spills. Empty pesticide containers at GRC shall be rinsed according to the manufacturer's instructions. Rinsed cans shall be disposed of through the C-260a waste disposal process.

6.2 State Procedural Requirements (*Ohio Revised Code, Chapter 921*)

The Ohio Revised Code (ORC) defines the Ohio pesticide law and provides for the registration of pesticides, the licensing of applicators, and pesticide application records in Ohio. Pesticide applicators employed by Lewis Field's Facilities Operations and Maintenance Contractor shall be licensed by the Ohio Department of Agriculture. Offsite contractors who apply pesticides at Lewis Field shall employ applicators who are licensed by the Ohio Department of Agriculture.

6.3 Requirements for Safety and Health Standards (29 CFR 1910.106, 29 CFR 1910.1200, and NFPA-434)

The Occupational Safety and Health Administration (OSHA) and National Fire Protection Association (NFPA) regulations pertaining to pesticides define how certain pesticides are to be stored and how the health hazards of pesticides must be communicated to employers and employees.

7.0 RECORDS

The Lewis Field's Facilities Operations and Maintenance Contractor's Business Management/Site Safety Manager maintains the following records for Lewis Field and the Code H Support Service Contractor maintains the following records for Plum Brook Station.

- Pesticide applications records
- Training records
- Dates of physical examinations
- Records of annual audits.—Maintained by the FIFRA program lead.

8.0 REFERENCES

Document number	Document name
40 CFR Parts 150–189	The Federal Insecticide, Fungicide, and Rodenticide Act
7 U.S.C., section 136 et seq.	Federal Environmental Pesticide Control Act of 1972
NFPA-434	Requirements for the storage of pesticides
ORC Chapter 921	Ohio Pesticide Code

APPENDIX A—DEFINITIONS AND ACRONYMS

Code of Federal Regulations (CFR)

Contracting Officer's Technical Representative (COTR)

Environmental Protection Agency (EPA)

Federal Environmental Pesticide Control Act of 1972 (FEPCA)

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).—Broadened the Federal Government's control of pesticides in 1947.

General-use pesticides.—Environmental Protection Agency's designation for pesticides that may be applied by anyone.

NASA Glenn Research Center (GRC)

Integrated pest management.—A coordinated approach to pest control intended to prevent unacceptable levels of pests, while causing the least possible hazard to people, property, and the environment and using the most cost-effective means.

National Fire Protection Association (NFPA)

National Environmental Policy Act (NEPA)

Occupational Safety and Health Administration (OSHA)

Ohio Revised Code (ORC)

Pest.—A harmful, destructive, or nuisance insect, fungus, rodent, nematode, bird, snail, weed, or parasitic plant or a harmful animal species that the state director of agriculture, or his authorized representatives, declares to be a pest, except viruses, bacteria, or other microorganisms on or in living animals, including man.

Restricted-use pesticides.—Environmental Protection Agency defines restricted-use pesticides as those which may cause adverse effects on the environment, and/or the applicator, unless subject to additional regulatory restrictions. They will generally be available only to certified applicators.

Safety, Health and Environmental Division (SHED)

Safety and Mission Assurance Directorate (SMAD)

United States Code (U.S.C.)

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Chapter 19—Drinking Water Program

NOTE: *This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was November 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.*

1.0 PURPOSE

This chapter establishes policies, procedures and practices to maintain acceptable potable water quality at the NASA Glenn Research Center's (GRC's) Lewis Field (LF) and Plum Brook Station (PBS). This chapter supports GRC's environmental and occupational health policies, which promotes pollution prevention, regulatory compliance, continuous improvement and employee health.

2.0 APPLICABILITY

This chapter applies to all civil servant and contractor employees assigned to Lewis Field and Plum Brook Station.

3.0 BACKGROUND

The quality of drinking water at GRC is highly important to the workforce. Potable water is supplied to Lewis Field by the City of Cleveland and to PBS by the Erie County Water Division.

Water quality information can be found on the web site for each supplier.

For Cleveland: www.clevelandwater.com

For Erie County: www.eriecounty.oh.gov

The Ohio EPA's Division of Drinking and Ground Waters (DDAGW) ensures compliance with the federal Safe Drinking Water Act and evaluates potential threats to source waters that supply Ohio's more than 5,000 public drinking water systems. The web sites for both suppliers provide information on their respective water quality and that they meet Safe Drinking Water Act (SDWA) specifications. Therefore, under normal circumstances, the only potential sources for the introduction of contamination are assumed to be on NASA premises. Abnormal circumstances such as a supplier water main break in the immediate vicinity of Lewis Field or PBS may require additional disinfecting procedures or extended flushing after the repair to restore safe drinking water quality to the GRC systems.

Water quality parameters were established by the U.S. Environmental Protection Agency established both primary and secondary drinking water standards to control the level of contaminants in the Nation's drinking water. These are legally enforceable standards that apply to public systems. These standards are found in the "National Primary Drinking Water Regulations."

The SDWA was enacted in 1974. This law requires utilities such as the Cleveland Water Department and the Erie County Water Division to supply potable water that is safe for human consumption in compliance with the requirements of the Act. This obligation effectively ends at the water meters installed in the main supply lines entering NASA premises. Thereafter GRC is responsible for the stewardship of the water distribution system and continuation of water quality delivered by the local utility.

Other public laws and public health regulations also govern how potable water systems are to be operated and maintained. However, these do not apply to GRC by definition. The relevant regulation followed on NASA premises is from OSHA regulations found in:

29 CFR 1910.141(a)(2)

Potable water means water that meets the standards for drinking purposes of the State or local authority having jurisdiction, or water that meets the quality standards prescribed by the U.S. Environmental Protection Agency's National Primary Drinking Water Regulations (40 CFR 141).

29 CFR 1910.141(b)(1)(i) Potable water

Potable water shall be provided in all places of employment, for drinking, washing of the person, cooking, washing of foods, washing of cooking or eating utensils, washing of food preparation or processing premises, and personal service rooms.

4.0 POLICY

It is GRC policy to provide consistent water quality and protect drinking water sources from contamination during operation and maintenance of potable water in compliance with regulations.

This chapter describes the responsibilities, processes and requirements in order to promote consistency and protect drinking water sources during distribution, repair and system maintenance. To meet these requirements GRC complies with the most current version of the following codes, instructions, laws and standards: “Safe Drinking Water Act of 1974 including 1986 and 1996 amendments,” “American Water Works Association (AWWA) standard c651,” and the “disinfection of finished water storage facilities & water mains, OPR-05-002” from the Ohio EPA Operations Policy.

Lewis Field water quality is verified annually. Due to the configuration of the distribution system, PBS water quality is sampled and tested more frequently. Refer to Section 6.3.

5.0 RESPONSIBILITIES

5.1 Users

Drinking water distribution is part of the infrastructure serving all of GRC. Its purpose is for human consumption. The drinking water system is not intended to provide cooling for equipment, test rigs, or other research activities.

5.1.1 Backflow Prevention

Users must avoid direct connections to fixture outlets to prevent water from an uncontrolled source back flowing into the drinking water distribution system. A backflow prevention device, typically a vacuum breaker, at the fixture or an air gap between the end of the connection (typically a hose) and the surface of the water level of the end use serve this purpose.

5.1.2 Contaminated Water Quality

Should users suspect contaminated water quality as evidenced by odor, taste, or turbidity, the facilities maintenance organization is contacted to initiate source tag out, sampling and testing work.

- Lewis Field sampling and testing of water quality under these circumstances is initiated by users requesting this work through the Building Manager or the Facilities Division Work Management Office (216-433-4948).
- PBS sampling and testing of water quality under these circumstances is accomplished by users requesting this work through the PBS Work Control Office (419-621-3336).

5.2 Safety and Health Division (SHeD)

SHeD is responsible for verifying that the GRC drinking water program complies with OSHA regulations. SHeD verifies compliance by conducting periodic audits of the Drinking Water Program sampling and maintenance records.

5.3 Facilities Division (Code FD)

Facilities Division (FD) is responsible for the operation, maintenance and long-term stewardship of the drinking water distribution system. System condition, integrity, and performance are overseen by a System Manager. Operation and maintenance functional responsibilities include: water quality sampling and analyses, tagging systems out of service, samples taken and tested, repairs, capital improvements, and conservation measures at Lewis Field.

5.3.1 System Repairs

FD responds to and performs all repairs to the water distribution system

5.3.2 Water Quality

Upon notification of employee concerns with the water quality at LF, the initial response is the source is tagged out of service. Sampling is conducted by the FD contractor and sent to an approved testing facility for analysis.

5.3.3 The FD Building Manager

In situations where water quality is suspect as described in Section 5.3.2, the Building Manager is responsible to perform the following when poor water quality is suspected:

- Expediting the work order for sampling and testing through the FD Work Control Office (216-433-4849).
- Notifies all building occupants of the situation to ensure clear communication on status is provided.
- Communicates the results of the lab analysis to requester and/or building occupants.

5.4 Energy and Environmental Management Office (Code FE)

Code FE is the steward of the Drinking Water Program. Code FE is responsible for:

- Monitoring the water quality as delivered to GRC by the City of Cleveland Water Department and to PBS by the Erie County Water Division.
- Acting as the interface between GRC and regulatory agencies. Code FE informs drinking water system operators and users on the requirements to comply with regulations.
- Establishing scope and frequency of recurring water quality sampling and testing for GRC systems.
- Custodian of all test results and other records that pertain to the drinking water program and system.
- Coordinator of Agency functional reviews of the Drinking Water Program.

5.5 Plum Brook Station

Plum Brook Management Office (Code H) is responsible for the operation, maintenance and long-term stewardship of the drinking water distribution system at PBS. PBS takes a proactive approach to ensure the domestic water distributed to employees meets the Safe Drinking Water Act specifications.

5.5.1 System Oversight

System condition, integrity, and performance are overseen by a system manager in FD.

5.5.2 Operation and Maintenance

Operation and maintenance functions are performed by the PBS onsite contractor. These functions include: water quality sampling and analyses, tagging systems out of service, sampling and testing, repairs, and conservation improvements.

6.0 REQUIREMENTS

All personnel performing work on the drinking water system at GRC shall have a working knowledge of the following documents, procedures, and policies and shall follow with the requirements therein. If a conflict in procedure/policy arises between this chapter and local, State, or Federal Regulations, the most stringent requirements shall apply.

6.1 System Disinfection

Anytime the delivery system piping containment integrity is breached (e.g. a water main break, new connection, etc.) the repair procedure must include disinfecting the system and testing to verify the water quality is safe once service has been restored, but before any consumption.

6.1.1 AWWA Standard C651

AWWA Standard C651 is the procedure required for disinfecting new and repaired water systems. AWWA Standards for disinfection of finished water storage facilities and water mains are referenced in rule 3745-83-01 of the Ohio Administrative Code.

6.1.2 Ohio Operations Policy

Ohio EPA Operations Policy OPR-05-002.—Disinfection of Finished Water Storage Facilities & Water Mains.

6.1.3 Disinfection Standards

Disinfection rules from Ohio Administrative Code:

- Minimum chlorine residual—OAC rule 3745-83-01 (C)(1): At least 0.2 mg/L free chlorine or 1 mg/L combined chlorine
- Maximum residual disinfectant level (MRDL)—OAC 3745-81-10(C): 4.0 mg/L total chlorine (as Cl₂)

6.2 Draining Drinking Water

6.2.1 Drain to Sanitary Sewer System

Drinking water must not be drained to any storm water sewer. Drinking water shall be drained to the sanitary sewer system, regardless of how it is used.

6.2.2 Storm Sewer Discharge Chlorine Limit

GRC has limits for chlorine in its storm water discharge defined by the permit allowing Lewis Field to discharge storm water into the Rocky River. Therefore, provisions must be made to prevent the chlorinated drinking water used for system flushing new or repaired water mains from flowing into storm drains, or pretreating the water to remove the chlorine prior to drain.

6.3 Water Quality

Water quality at GRC is verified by a sampling and testing program. Samples are collected at end use points. Sampling procedures shall comply with Ohio Administrative Code. Sample testing shall be performed at a laboratory certified according to Ohio Administrative Code Chapter 3745-89 – Lab Approval.

6.3.1 LF Sampling Procedure

Sampling at Lewis Field is performed annually. Refer to Appendix C for details.

6.3.2 PBS Sampling Procedure

The configuration of the drinking water distribution at PBS requires different sampling and testing procedures for assuring water quality. Refer to Appendix C for details.

6.3.2.1 Additional Requirements

PBS drinking fountains have been surveyed to ensure that any fountain does not contain a lead liner; no drinking fountains onsite contain a lead liner. A flushing device has been installed on many of the PBS fountains to help ensure better water quality.

6.3.3 Substandard Test Results

Test results not meeting standards require additional sampling and testing to determine the source of the contamination. Appropriate repairs are performed to restore safe water quality. Once the source is safe for employee consumption, water service is restored and appropriate personnel are notified of analytical results.

6.4 Codes, Laws, and Standards

The laws, codes, standards, and instructions relate to the safe operation and maintenance of drinking water systems at GRC. The latest versions of these publications/documents shall be followed. More information on relevant regulations is found in Appendix B.

6.4.1 Backflow Preventers

To assure compliance with 29 CFR 1910.141 (b) (1) (i) and 1910.141 (b) (2) (ii), FD requires the following for all domestic water services to all facilities at GRC: a reduced pressure backflow preventer shall be installed on both the potable and nonpotable supplies; a double check valve (as approved by the AHJ) shall be installed on all water based sprinkler system supplies.

7.0 RECORDS

7.1 Water Quality Reports

EEMO maintains all sampling and analysis Analytical Reports on file in Building 21, Room 135.

7.2 Maintenance Records

Maintenance records, repair records, and capital improvements are kept by the Facilities Division in the maintenance management system.

7.3 Drinking Water Program Audit Records

Audit reports are maintained by the Safety and Health Division's Occupational Health Branch.

8.0 REFERENCES

Document number	Document Title
SDWA	Safe Drinking Water Act of 1974 and Its 1986 and 1996 Amendments
AWWA Standard C651	Disinfecting Water Mains
OPR-05-002	Disinfection of Finished Water Storage Facilities & Water Mains
40 CFR part 141	National Primary Drinking Water Regulations
40 CFR part 142	National Primary Drinking Water Regulations Implementation
40 CFR part 143	National Secondary Drinking Water Regulations

Note: See Appendix B for information and links to laws and regulations.

APPENDIX A.—ACRONYMS AND DEFINITIONS

A.1 Acronyms

Authority Having Jurisdiction (AHJ)

American Water Works Association (AWWA)

Chemical Sampling and Analysis Program (CSAP)

Code of Federal Regulations (CFR)

Environmental Protection Agency (EPA)

Glenn Research Center (GRC)

Lewis Field (LF)

Milligrams of substance per liter of water (mg/L)

National Pollution Discharge Elimination System (NPDES)

Ohio Administrative Code (OAC)

Plum Brook Station (PBS)

Safe Drinking Water Act (SDWA)

Safety, Health and Environmental Division (SHeD)

United States Environmental Protection Agency (USEPA)

A.2 Definitions

Backflow—The flow through a cross-connection from a possible source of contamination back into the drinking water system. It occurs when a cross-connection is created and a pressure reversal, either as back-siphonage or backpressure, occurs in the water supply piping.

Cross-Connection—Any physical connection created between a possible source of contamination and any drinking water system piping.

“National Primary Drinking Water Regulations (primary standards)”—Legally enforceable standards that apply to public water systems. Primary standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in water.

“National Secondary Drinking Water Regulations (secondary standards)”—Non-enforceable guidelines regarding contaminants that may cause cosmetic effects or aesthetic effects (such as taste, odor, or color) in drinking water.

The EPA recommends secondary standards to water systems but does not require systems to comply.

Nephelometric turbidity units (NTU)—Turbidity is measured in NTU. The instrument used for measuring it is called nephelometer or turbidimeter, which measures the intensity of light scattered at 90° as a beam of light passes through a water sample.

pH—A measure of acidity and alkalinity of a solution that is a number on a scale on which a value of 7 represents neutrality; lower numbers indicate increasing acidity and higher numbers, increasing alkalinity.

Threshold odor number (TON)—A value indicative of the maximum dilution, which can be made of a sample with its odor remaining detectable. A higher TON indicates a stronger odor.

Water quality—Determined by comparing the concentration of contaminants in the water with specifications set forth in the Safe Drinking Water Act (SDWA) and its 1986 and 1996 amendments.

APPENDIX B.—SUMMARY OF REGULATIONS AND REQUIREMENTS

B.1 Safe Drinking Water Act of 1974 and Its 1986 and 1996 Amendments

This law protects the public health by authorizing the United States Environmental Protection Agency (USEPA) to set national health-based standards for drinking water to protect against both naturally occurring and manmade contaminants that may be found in drinking water. The 1996 amendments greatly enhanced the existing law by establishing an approach that ensures the quality of drinking water by protecting it from source to tap.

The text of the SDWA can be found at this link:

<http://uscode.house.gov/uscode-cgi/fastweb.exe?getdoc+uscview+t41t42+1423+59++%28%29%20%20>

EPA PRIMARY STANDARD List of contaminants can be found at this link:

<http://water.epa.gov/drink/contaminants/index.cfm#List>

Ohio EPA SECONDARY Contaminant STANDARD can be found at this link:

<http://codes.ohio.gov/oac/3745-82-02>

B.2 OSHA Requirements

Note: The citation is included for reference and the text may not be the current version. The complete, current version of these requirements can be found at this link:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9790

Abridged, unofficial text included for reference only:

B.2.1 29 CFR 1910 OSHA General Industry

1910.141(a)(1)

Scope. This section applies to permanent places of employment.

1910.141(a)(2)

Definitions applicable to this section:

Potable water means water that meets the standards for drinking purposes of the State or local authority having jurisdiction, or water that meets the quality standards prescribed by the U.S. Environmental Protection Agency's National Primary Drinking Water Regulations (40 CFR 141).

1910.141(b) Water supply.

1910.141(b)(1) Potable water.

1910.141(b)(1)(i)

Potable water shall be provided in all places of employment, for drinking, washing of the person, cooking, washing of foods, washing of cooking or eating utensils, washing of food preparation or processing premises, and personal service rooms.

1910.141(b)(1)(iii)

Portable drinking water dispensers shall be designed, constructed, and serviced so that sanitary conditions are maintained, shall be capable of being closed, and shall be equipped with a tap.

1910.141(b)(1)(v)

Open containers such as barrels, pails, or tanks for drinking water from which the water must be dipped or poured, whether or not they are fitted with a cover, are prohibited.

1910.141(b)(1)(vi)

A common drinking cup and other common utensils are prohibited.

1910.141(b)(2) Nonpotable water.

1910.141(b)(2)(i)

Outlets for nonpotable water, such as water for industrial or firefighting purposes, shall be posted or otherwise marked in a manner that will indicate clearly that the water is unsafe and is not to be used for drinking, washing of the person, cooking, washing of food, washing of cooking or eating utensils, washing of food preparation or processing premises, or personal service rooms, or for washing clothes.

1910.141(b)(2)(ii)

Construction of nonpotable water systems or systems carrying any other nonpotable substance shall be such as to prevent backflow or back siphoning into a potable water system.

1910.141(b)(2)(iii)

Nonpotable water shall not be used for washing any portion of the person, cooking or eating utensils, or clothing. Nonpotable water may be used for cleaning work premises, other than food processing and preparation premises and personal service rooms: Provided, That this nonpotable water does not contain concentrations of chemicals, fecal coliform, or other substances which could create unsanitary conditions or be harmful to employees.

B.3 AWWA Standard C651

This standard presents essential procedures for disinfecting new and repaired water mains. Topics covered include forms of chlorine disinfection, a description of the disinfection procedure, preventive and corrective measures during construction, methods of chlorination, final flushing, bacteriological testing, repeated disinfection, final connections to existing mains, disinfection procedures when cutting into or repairing existing mains, and special procedures for caulked tapping sleeves. Appendices cover chlorine residual testing and disposal of heavily chlorinated water.

B.4 Ohio EPA Operations Policy OPR-05-002 - Disinfection of Finished Water Storage Facilities & Water Mains

AWWA Standards for the disinfection of finished water storage facilities and water mains, which are referenced in rule 3745-83-01 of the Ohio Administrative Code (OAC) are explained in this document. The intent of this policy is to achieve consistent application of these standards throughout the state.

Disinfection of finished water storage facilities and water mains – OAC rule 3745-83-01 (C)(5) and (C)(6).

APPENDIX C.—WATER ANALYSIS

C.1 Lewis Field Procedure

Water quality is verified by annual sampling and testing. Drinking water shall be sampled and tested at end use fixtures on an annual basis. Sampling locations are varied each year to achieve coverage of all end use fixtures over a 10-year period.

FD implements the annual water quality sampling, testing and analysis for the Drinking Water Program. The samples are collected at point of use fixtures across Lewis Field and for all fixtures in the cafeteria. EEMO determines the location and number of fixtures to be sampled at random based on statistical analysis techniques. Samples are collected by the maintenance contractor and delivered to a facility approved by the Ohio EPA Division of Environmental Services Laboratory Certification Section for testing and analyses. These results are delivered to FD and FE for record keeping. Samples that do not meet acceptable water quality standards require additional sampling and testing to determine the source of water quality issue.

C.2 PBS Procedure

The nature of the water distribution system (long piping runs and relatively little use) at PBS requires more frequent and widespread water quality testing.

C.3 Sampling Program

- A water sample is collected annually from all active drinking water fountains and analyzed as appropriate for compliance with primary and secondary drinking water standards.
- Each sample is analyzed for free and total chlorine, chromium (total), copper, iron, lead, odor, pH, and zinc.
- Based on analytical results, the source remains in service or is tagged out of service pending further analysis.
- Corrective action is taken as necessary; that is, lines are flushed and the source repeatedly analyzed until the source is able to maintain compliance with the drinking water standards.
- If a source is unable to meet the drinking water standards, an alternative water supply is used until the cause of the contamination is identified and corrected.

C.4 Total Coliform Rule Analysis

Six water samples are also collected monthly and analyzed for free and total chlorine. Samples are also sent to an Ohio EPA certified laboratory for Total Coliform Rule analysis. Three are from the same locations and three are from random locations. Results are sent to the Plum Brook Chemistry Lab. If coliforms are present in the samples, the offsite laboratory notifies the Chemistry Lab. The location is tagged out of service and additional samples are collected and sent offsite for analysis. This is completed until results are negative for 2 consecutive days. Once this occurs, the out of service tag is removed and the water supply is put back into service.

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Chapter 23—Handling, Reuse, and Disposal of Soil

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes policies and procedures for the handling, reuse, and disposal of soil at the NASA Glenn Research Center (GRC). The guidance provided in this chapter is applicable to GRC employees and contractors at all levels who in any way participate in the development and execution of GRC action involving the handling, excavation, storage, transportation, and/or disposal of soils. It sets forth guidelines to ensure that such operations do not result in solid or hazardous wastes being disposed of improperly and to ensure that areas of contamination are promptly addressed.

2.0 APPLICABILITY

This chapter is applicable to all personnel at GRC including, but not limited to, civil servants, contractor personnel, and students.

3.0 BACKGROUND

To address the increasing problems that the Nation faced from its growing volume of municipal and industrial waste, Congress enacted the Resource Conservation and Recovery Act (RCRA) in 1976 as an amendment to the 1965 Solid Waste Disposal Act. The RCRA set national goals for (1) protecting human health and the environment from the potential hazards of waste disposal, (2) conserving energy and natural resources, (3) reducing the amount of waste generated, and (4) ensuring that wastes are managed in an environmentally sound manner. Many states, including the State of Ohio, have passed their own laws and regulations and established programs for ensuring conformance with these laws and regulations. This chapter addresses the areas of the RCRA that apply to the management of soils.

4.0 POLICY

It is GRC policy to comply with state and Federal regulations. It is also GRC policy to (1) minimize the volume and toxicity of waste soils generated by GRC operations to the extent that is technically and legally possible and is economically practicable, and (2) evaluate the need for analyses on all soils prior to excavation and reuse excavated soil as fill material at GRC whenever possible.

5.0 RESPONSIBILITIES

5.1 Facilities Division—Project Manager

- Arranges (through the Facilities Division (FD) soil coordinator) for a site assessment to be performed for all projects that include the excavation of soil
- Arranges (through the FD soil coordinator) for preconstruction soil sampling to be performed, if required, by the Energy and Environmental Management Office (EEMO) Soil Program manager or an appropriate contractor for all construction or facility maintenance projects early in the planning phase
- For emergency or unplanned projects requiring excavation, contacts the EEMO Soil Program manager for guidance and recommendations concerning the appropriate environmental requirements
- Arranges for the disposal of excavated soil as recommended by EEMO Soil Program manager
- Ensures that contractors under their control fill out nonhazardous waste, hazardous waste, and solid waste manifests with coordination and guidance from the EEMO Waste Management group
- Ensures that—when soil discoloration, odors, debris, or other evidence of past disposal or release of chemicals or waste is encountered—work on the site stops and findings are reported to the EEMO Soil Program manager

5.2 Facilities Division—Soil Coordinator

- Coordinates all projects requiring preconstruction soil sampling with the EEMO Soil Program manager
- Maintains an inventory on all previous environmental assessments and pertinent environmental analysis
- Maintains a record of each site assessment that includes site historic information, sampling decisions, sampling plans, and analytical data

5.3 Energy and Environmental Management Office—Soil Program Manager

- Reviews and approves all sampling and analysis plans
- Reviews site assessment reports, recommends proper disposal or soil placement procedures, and completes Soil Determination Checklist (see NASA C-133, sample included in Appendix C)

5.4 Energy and Environmental Management Office—Manifests Signatory

On behalf of GRC, the manifests signatory provides signature authority on all waste and nonwaste manifests for offsite shipments.

5.5 Energy and Environmental Management Office—Waste Management

- Reviews and approves potential disposal sites
- Ensures that all analytical needs for the disposal facility have been met
- Provides guidance to the project manager and designated contractors on a daily basis
- Shall maintain a record of waste characterization and classification
- Obtains authorization from the Director of the Ohio Environmental Protection Agency for any construction on previous or existing solid or hazardous waste sites
- Coordinates with outside agencies as appropriate
- Reviews hazardous, nonhazardous, and nonwaste manifests, along with their associated documents, and advises EEMO manifests signatory on whether they meet requirements for signature
- Tracks returned manifests and maintains shipping documents, which include manifests, land-disposal notifications, and related documents
- Provides regulatory compliance checks on potential transporters and on treatment, storage, and disposal facilities
- Shall maintain a list of waste disposal parameters
- Obtains the appropriate EEMO signatures on profiles and manifests

5.6 Other GRC Organizations

All GRC organizations planning projects where soil is to be excavated must contact EEMO for guidance. If previous environmental data are not available, preconstruction soil sampling may be required to determine the potential hazard of the soil.

6.0 REQUIREMENTS

6.1 Training

Any person who is handling and/or managing hazardous soil shall be trained as stated in Chapter 5 of the Environmental Program Manual, Management of Hazardous Waste and RCRA Compliance.

6.2 Site Assessment

A site assessment is required for any project at GRC that includes the excavation of soil. The site assessment consists of the following:

- A review of available records to determine if the excavation site is located within the boundary of an area of concern (AOC) or other regulated unit
- A review of available records and laboratory analytical data to determine whether a release of chemicals or wastes has occurred and to identify potential contaminants of concern (COCs) based on past operations conducted at or near the excavation site
- A review of available laboratory analytical data generated from the sampling and analyses of soil from within the excavation site to characterize the soil for reuse and/or to support disposal characterization

The goal of a site assessment is to characterize the soil so that it will be properly managed. A site assessment is not required for a small-scale excavation (as determined by EEMO).

6.3 Preconstruction Soil Sampling

For an excavation site determined to be located within or near the boundary of an AOC or regulated unit, preconstruction sampling is required in the absence of available laboratory analytical data generated from the sampling and analyses of soil from within the excavation site. Soil samples will be analyzed for COCs associated with the AOC or regulated unit and any other COCs identified during the excavation site assessment.

For an excavation site determined not to be located within or near the boundary of an AOC or regulated unit, preconstruction sampling is required if the site assessment indicates that chemicals or wastes may have been released to the soil in the past.

The preconstruction sampling described in this section will be conducted prior to the start of construction and, in most cases, will require soil borings to obtain samples from appropriate depths. On a case-by-case basis, EEMO will develop site-specific sampling recommendations as part of the preconstruction planning process. EEMO or an outside party will develop a site-specific sampling plan that will incorporate these recommendations. EEMO will review and approve all sampling plans developed by outside parties.

6.4 Analytical Data Evaluation (OAC 3745-52-11 and OAC 3745-300-08)

A determination that excavated soil is a waste will be based on the results of the site assessment and will include an evaluation of all applicable laboratory analytical data resulting from previous soil sampling events and/or preconstruction soil sampling and will be conducted in accordance with Ohio Administrative Code (OAC) rule 3745-52-11. In addition, soil to be excavated from within or near an AOC or regulated unit will be evaluated against the Ohio Voluntary Action Program (VAP) generic direct-contact soil standards as listed in OAC rule 3745-300-08. Soil with constituents detected at maximum concentrations less than Ohio VAP Generic Direct Contact Residential Standards or Commercial Standards will be considered for use onsite or offsite for use at commercial or industrial lands.

6.5 Waste Disposal Characterization

Waste disposal characterization will consist of the collection of soil samples analyzed for the full list of disposal facility parameters and may be conducted as part of preconstruction soil sampling. EEMO will maintain the list of disposal parameters.

6.6 Soil Excavation

If soil discoloration, odors, debris, or other evidence of past disposal or release of chemicals or wastes is encountered during excavation activities, work on the project must stop and project personnel must report the findings to the FD Project Manager. The FD Project Manager then will consult with the EEMO Soil Program manager to determine the appropriate course of action.

6.7 Excavated Soil Disposition

Soil classified as solid waste, Toxic Substances Control Act waste, or hazardous waste will be disposed of only at a landfill licensed to accept the soil. Soil that is not classified as a waste may be released to use as commercial or industrial land fill.

7.0 RECORDS

Soil Determination Checklist (NASA C-133, sample included in Appendix C).—Maintained by EEMO Soil Program manager.

Waste profiles, waste characterization and classification, and waste manifest records.—Maintained by EEMO Waste Management.

Site assessment report (includes site historic information, sampling decisions, sampling plans, and analytical data records).—Maintained by FD.

8.0 REFERENCES

Document number	Document name
40 Code of Federal Regulations (CFR) 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 260 and 263 (as amended)	Hazardous Waste Management System
NASA C-133	Soil Determination Checklist
OAC 3745-27	Ohio Environmental Protection Agency—Solid Waste and Infectious Waste Regulations
OAC 3745-51	Ohio Environmental Protection Agency—Identification and Listing of Hazardous Waste
OAC 3745-52	Ohio Environmental Protection Agency—Generator Standards
OAC 3745-53	Ohio Environmental Protection Agency—Transporter Standards
OAC 3745-270	Ohio Environmental Protection Agency—Hazardous Wastes Restricted From Land Disposal

APPENDIX A.—DEFINITIONS AND ACRONYMS

Area of concern (AOC).—Includes both (1) Solid Waste Management Units where releases of hazardous substances may have occurred and (2) locations where there has been a release or threat of a release into the environment of a hazardous substance, pollutant, or contaminant (including radionuclides) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Code of Federal Regulations (CFR)

Commercial land.—Land with potential exposure of adult workers during a business day and potential exposures of adults and children who are customers, patrons, or visitors to such facilities. Examples of commercial land include—but are not limited to—building supply facilities, office buildings, hotels, and parking facilities.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).—Commonly known as the Superfund.

Contaminant of concern (COC).—Any hazardous constituent or chemical contaminant detected in excavation site soil or associated with an AOC or regulated unit within which an excavation site is located.

Disposal parameters.—A listing of waste constituents and properties.

Energy and Environmental Management Office (EEMO)

Facilities Division (FD)

Generic direct-contact soil standard.—“A generic numerical standard based on an exposure resulting from ingestion of soil, dermal contact with soil or inhalation of volatile and particulate emissions from soil” (from OAC 3745–300–08).

Industrial land.—Land with exposure of adult workers during a business day. Industrial land use must reliably exclude the general public and children from access to the facility. Examples of industrial land include—but are not limited to—power plants, manufacturing facilities, chemical plants, nonpublic airport areas, and limited-access highways.

NASA Glenn Research Center (GRC)

Ohio Administrative Code (OAC)

Polychlorinated biphenyl (PCB)

Resource Conservation and Recovery Act (RCRA)

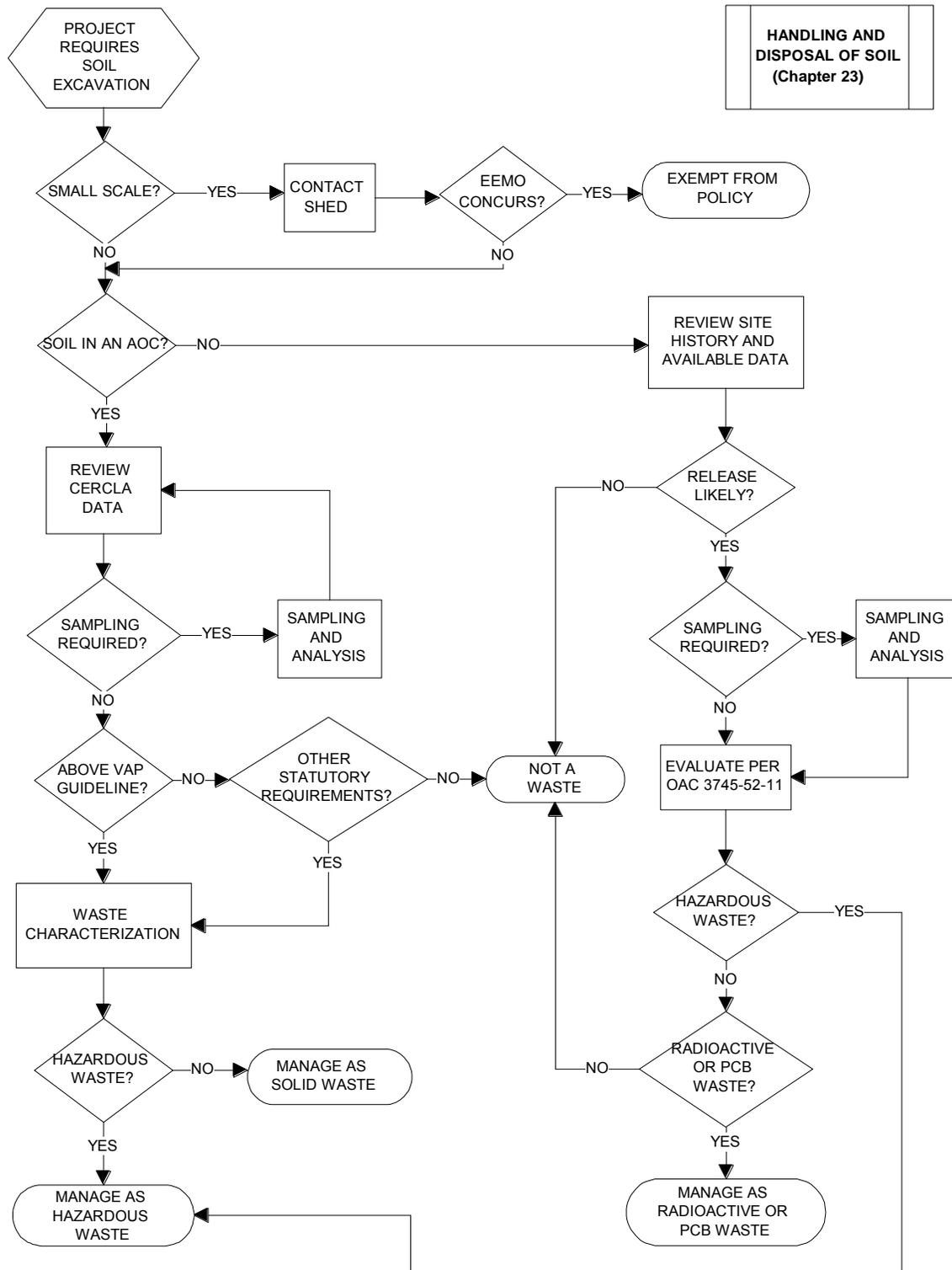
Site assessment.—Gathering information on the chemical and physical nature of site contaminants. At the NASA Glenn Research Center (GRC), this is done to determine the disposition of excavated soil.

Small-scale excavation.—Small excavation where all excavated soil is to be returned to its original location. The determination of what constitutes a small-scale excavation will be left to the discretion of the Environmental Management Branch. Examples of a small-scale excavation include grounds maintenance, planting of shrubs, installation of fence posts, or some emergency pipe repairs.

To be determined (TBD)

Voluntary Action Program (VAP).—Ohio program defined in OAC 3745–300–01 through 3745–300–15.

APPENDIX B.—SOIL HANDLING, REUSE, AND DISPOSAL FLOWCHART



HANDLING AND DISPOSAL OF SOIL (Chapter 23)

APPENDIX C.—SAMPLE SOIL DETERMINATION CHECKLIST

Soil Determination Checklist

1. Location of excavation: _____
2. Is the site within or near a CERCLA Area of Concern (AOC)? YES NO
3. Is there evidence of contamination? YES NO
4. Do any soil sampling data exist? YES NO
5. Is the existing data adequate? YES NO TBD [Go to #9]
6. Should additional data be collected and evaluated? YES NO TBD
7. Soil in the AOC is

Below Voluntary Action Plan (VAP) residential standards	
Above VAP residential / Below commercial standards	
Above VAP commercial standards	

8. If the soil determined to be a waste? YES NO TBD
9. _____

Note: All soil determined to be a waste must be properly characterized for disposal.

Attachments:

Reviewer: _____ Date: _____

Form C-133 Revised 5-2002

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Chapter 21—Cultural Resources

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes policies and procedures for managing cultural resources at the NASA Glenn Research Center's (GRC's) Lewis Field and Plum Brook Station (PBS).

2.0 APPLICABILITY

This chapter is applicable to all GRC actions that involve the management of cultural resources at GRC or at any NASA-controlled, Government-owned facilities associated with GRC. It is applicable to GRC employees and contractors at all levels who in any way participate in the formulation, development, and execution of qualifying NASA actions.

3.0 BACKGROUND

In 1966, Congress passed the National Historic Preservation Act (NHPA) to ensure that places of historic value were preserved and enhanced. Section 106 of the act requires Federal agencies to consult with the Advisory Council on Historic Preservation (ACHP) on actions adversely affecting listed or eligible properties. Under 36 Code of Federal Regulations (CFR) 800, Protection of Historic Properties, the consultation with the ACHP is conducted primarily through the Ohio Historic Preservation Office (OHPO).

GRC is mandated by the NHPA to consider the effects on historic and archaeological properties of any action undertaken by NASA, its contractors, or tenants on GRC land. There are two categories of properties of concern: those listed on the National Register of Historic Places (NRHP) and those eligible for listing. Whenever a project or action will or may adversely affect one of the Center's listed or eligible properties, GRC shall consult with the OHPO and the ACHP. Determination of the need for consultation is typically done through the use of the GRC Environmental Analysis Checklist (EVAL Checklist, NASA C-150) process. The NASA C-150—a questionnaire filled out by project managers at an early stage of project definition—lists most potential areas of likely environmental impacts. The checklist is submitted to the historic preservation officer (HPO) for review.

Three GRC facilities were designated by the National Park Service as National Historic Landmarks as a part of the 1984 Man in Space thematic nomination. They were the Rocket Engine Test Facility, the Zero Gravity Facility, and the Spacecraft Propulsion Research Facility (B-2 Facility at PBS). The Rocket Engine Test Facility has been demolished under a Programmatic Agreement with the ACHP.

Executive Order (EO) 11593, Protection and Enhancement of the Cultural Environment, requires all Federal agencies to identify archaeological and historic properties under their jurisdiction that are eligible for listing in the NRHP and to take steps to avoid impacting them. It also calls for the complete documentation of any NRHP-eligible site or property that will be demolished as a result of a Federal undertaking. The [Archaeological Resources Protection Act of 1979](#) prohibits unauthorized excavation of archaeological resources on Federal land and on Native American land without a permit or memo to file issued by GRC's HPO.

In addition to facilities, NASA has additional responsibilities to preserve the unique objects under its control that document the history of the science and technology of aeronautics and astronautics.

4.0 POLICY

It is a goal of GRC to comply with all Federal, State, and Agency regulatory requirements related to cultural resources under its control. These include the NHPA, the Archaeological and Historic Preservation Act, and the Programmatic Agreement among the National Aeronautics and Space Administration, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation.

5.0 RESPONSIBILITIES

5.1 Historic Preservation Officer

The chief architect or their designee serves as the Historic Preservation Officer (HPO). The HPO issues an opinion on the culturally historic impacts of every NASA C-150 that is forwarded to the National Environmental Policy Act (NEPA) program manager. The HPO communicates with the OHPO and the ACHP on historic preservation issues. The HPO maintains the Ohio Historic Inventory forms for GRC and is responsible for archaeological resources at GRC. Where excavations are proposed in archaeologically sensitive areas, the HPO arranges for subsurface testing per the procedures outlined in the Cultural Resources Management Plan for GRC. The HPO is also responsible for issuing a permit or memo to file to meet the requirements of the Archeological Resources Protection Act of 1979 when excavation of archaeological resources is to occur on Federal or Native American land.

5.2 National Environmental Policy Act Program Leads at Lewis Field and Plum Brook Station

The NEPA program leads review and approve NASA C-8095, Statement of Work (SOW) Requirements Review and Concurrence; NASA C-150s; Safety Permit Requests; and Congressional Notification of Grants for NEPA concerns, including impacts to historic and archaeological assets. They provide support in the area of cultural resources management to the HPO and PBS management offices.

5.3 Property Disposal Officer

The property disposal officer is responsible for the disposal of artifacts excessed at GRC.

5.4 History Office Coordinator

The history office coordinator is responsible for managing the history contract at GRC. This coordinator is the focal point for communications regarding GRC's history with the History Office at NASA Headquarters and history contacts at other NASA centers.

5.5 Center Program Managers and Project Initiators

Program managers and project initiators shall complete the NASA C-150 at the earliest stages of a program or project to initiate the determination if a project will or may adversely affect one of GRC's listed or eligible properties. The completed C-150 shall be submitted to the HPO.

6.0 REQUIREMENTS

6.1 Procedural Requirements for Historic Preservation (16 U.S. Code (U.S.C.) 470 et seq., EO 11593, 16 U.S.C. 470aa-470mm, 16 U.S.C. 469 et seq.)

The NHPA requires Federal agencies to consider the effects of their actions on cultural resources that are listed in or are eligible for listing in the NRHP. To evaluate the possible effects of the proposed actions, Section 106 of the NHPA requires an agency to identify and evaluate historic properties, assess the effects of the project on the properties, consult with the OHPO, and solicit comments from the ACHP in certain instances. Results of historic and archaeological surveys are recorded on Ohio Historic Inventory and Ohio Archaeological Inventory forms. The NHPA protects those sites in the project area that are listed in or eligible for listing in the NRHP.

6.2 Procedural Requirements for Managing Modifications to NASA's Research Facilities (Appendix B)

The Programmatic Agreement among the National Aeronautics and Space Administration, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation establishes the procedures that NASA must follow when considering significant modifications to known or suspected historic research facilities. The agreement establishes the procedures for consultation with the ACHP and the OHPO prior to entering into an agreement on historic recordation procedures.

6.3 Procedural Requirement for Identification and Disposition of NASA Artifacts (NPR 4310.1)

The National Air and Space Museum (NASM), which is administered by the Smithsonian Institution, is responsible for the custody, protection, preservation, exhibition, and loan of artifacts received from Government agencies. Repositories for NASA artifacts are identified with the assistance of the NASM so as to most effectively inform the public regarding NASA's endeavors. Artifacts are offered to the NASM when programmatic utility to NASA has been exhausted.

7.0 RECORDS

- Ohio Historic Inventory forms.—Maintained by the HPO.
- Ohio Archaeological Inventory forms.—Maintained by the NEPA program leads at Lewis Field and PBS.
- Official correspondence with the OHPO.—Maintained by the HPO.

8.0 REFERENCES

Document number	Document name
16 U.S.C. 470 <i>et seq.</i>	National Historic Preservation Act of 1966
EO 11593	Protection and Enhancement of the Cultural Environment
EO 13287	Preserve America
16 U.S.C. 469 <i>et seq.</i>	Archaeological and Historic Preservation Act
16 U.S.C. 470aa-470mm	Archaeological Resources Protection Act of 1979
42 U.S.C. 1996	American Indian Religious Freedom Act
25 U.S.C. 3001 <i>et seq.</i>	Native American Graves Protection and Repatriation Act
36 CFR 60	National Register of Historic Places
36 CFR 800	Protection of Historic Properties
	Programmatic Agreement among the National Aeronautics and Space Administration, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation
	Cultural Resources Management Plan for Glenn Research Center at Lewis Field and Plum Brook Station

APPENDIX A.—DEFINITIONS AND ACRONYMS

Adverse effect.—An adverse effect is a Section 106 review finding in which it is determined that a proposed Federal action will adversely affect historic properties.

Advisory Council on Historic Preservation (ACHP).—This council was established under Section 201 of the National Historic Preservation Act of 1966. The mission of the ACHP is to promote the preservation, enhancement, and productive use of our Nation’s historic resources and to advise the President and Congress on national historic preservation policy.

Artifacts.—Artifacts, as applied to NASA, are unique objects that document the history of the science and technology of aeronautics and astronautics. Their significance and interest stem mainly from their relationship to historic flights, programs, activities, or incidents; achievements or improvements in technology; our understanding of the universe; and important or well-known personalities.

Code of Federal Regulations (CFR)

Glenn Research Center (GRC)

Historic Preservation Officer (HPO).—This official is designated by the director of each center responsible for coordinating that agency’s activities under the National Historic Preservation Act, as amended, and Executive Order 11593.

National Air and Space Museum (NASM)

National Environmental Policy Act (NEPA).—This Federal legislation established the national policy for protecting the human environment. NEPA requires Federal agencies to consider the environmental effects of their actions before beginning a project and to examine alternative actions that would reduce any threat or harm posed to the environment.

National Historic Preservation Act (NHPA).—This Federal legislation requires Federal agencies to consider the effects of their actions on cultural resources that are listed in or are eligible for listing in the National Register of Historic Places.

National Register of Historic Places (NRHP).—This national list of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, or culture is maintained by the Secretary of the Interior under the authority of Section 101(a)(1)(A) of the National Historic Preservation Act, as amended.

Ohio Archaeological Inventory.—This inventory contains the official record of archaeological site locations and information on such sites in Ohio. It is maintained by the Ohio Historic Preservation Office.

Ohio Historic Inventory.—This inventory is an ongoing State-wide survey of buildings, structures, and sites of architectural and historical significance. It is maintained by the Ohio Historic Preservation Office.

Ohio Historic Preservation Office (OHPO).—This division of the Ohio Historical Society, also known as the Historic Preservation Division, carries out mandated functions of the National Historic Preservation Act for the State.

Ohio Historic Preservation Officer.—This official is appointed or designated pursuant to Section 101(b)(1) of the National Historic Preservation Act to administer the State historic preservation program or a representative designated to act for the Ohio Historic Preservation Officer.

Plum Brook Station (PBS)

Section 106 of the National Historic Preservation Act of 1966.—This section of the National Historic Preservation Act of 1966 states: “The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any effect Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation a reasonable opportunity to comment with regard to such undertaking.”

APPENDIX B.—PROGRAMMATIC AGREEMENT AMONG THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, THE NATIONAL CONFERENCE OF STATE HISTORIC PRESERVATION OFFICERS, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

WHEREAS, the National Aeronautics and Space Administration (NASA) undertakes research, development, space mission operations, and management use of its facilities which have been designated as National Historic Landmarks (Landmarks) (Attachment 1); and

WHEREAS, such facilities require frequent modification over the life of agency missions to adapt them to meet the requirements of ongoing NASA programs; and

WHEREAS, NASA has determined that such modifications may have an effect on those Landmarks, and has consulted with the National Conference of State Historic Preservation Officers (NCSHPO) and the Advisory Council on Historic Preservation (Council) pursuant to the regulations (36 CFR Part 800) implementing Sections 106 and 110(f) of the National Historic Preservation Act, as amended (16 U.S.C. 470f and 470h-2(f)); and

WHEREAS, the Department of the Interior, National Park Service (NPS) was invited and participated in the consultation;

NOW, THEREFORE, NASA, the NCSHPO, and the Council agree that the programs shall be implemented in accordance with the following stipulations in order to take into account the effect of the programs and specific undertakings on the Landmarks.

Stipulations

NASA will ensure that the following measures are carried out.

I. Categories of Activities

A. When the proposed undertaking involves any of the following activities, NASA shall consult with the appropriate SHPO and, as necessary, the Council in accordance with Stip. II:

1. Demolition, dismantling, or relocation of original engineering structures, or of buildings housing facilities;
2. Removal or excessing of significant elements of the Landmarks specifically named on the National Register nomination forms;
3. New construction not compatible with major portions of the original structure or which alter the characteristics of the

facility which were specified as the reason for its Landmark designation; or

4. Changes in function, purpose, or use of a facility.

B. When the proposed undertaking is limited to the following activities that will not alter the characteristics of the facility which were specified as the reason for its landmark designation, NASA shall develop and implement mitigation measures in accordance with Stipulation III:

1. Replacement of historic hardware or components;
2. Modification of the original structure or equipment used in engineering structures, or buildings housing facilities; or
3. New construction compatible with existing structure, purpose, and operation of the facility.

NASA shall include a description of such activities and mitigation measures in the annual summary of its activities prepared pursuant to Stipulation IV.A.

C. When the proposed undertaking involves none of the activities specified above, NASA may proceed without consultation or the implementation of mitigation measures.

II. Consultation Process

A. Consultation required under Stip. I.A. shall be conducted as follows:

1. NASA shall provide the following documentation to the SHPO for review:
 - a. a description of the undertaking, with photos, maps, and drawings;
 - b. a description of the affected Landmark;
 - c. a description of the effects of the undertaking on the affected Landmark;
 - d. a description of alternatives to the proposed action, which were considered if any, and reasons not chosen;
 - e. a description of any mitigation measures proposed;
 - f. a description of NASA's effort, if appropriate, to obtain and consider views of affected interested persons on the proposed undertaking, including a copy of any comments received; and
 - g. the planning and approval schedule for the proposed undertaking.

Whenever feasible, NASA shall give the SHPO advance notice that such documentation is under preparation, and advise the SHPO of a date certain that it intends to submit the documentation to the SHPO.

2. The SHPO shall respond to a written request for consultation (accompanied by the documentation specified in Stip. II.A.1) within 20 working days, and agree, conditionally agree, or disagree with NASA's proposal.

3. If NASA does not accept the SHPO's conditions, or if NASA and the SHPO disagree, NASA shall notify the Council and forward copies of the documentation specified in Stip. II.A.1, above, along with other information relevant to the dispute.

4. Within 20 working days, the Council shall either: (1) attempt to resolve the dispute; (2) provide NASA with recommendations to be taken into account in implementing the activity; or (3) decide to comment, and comment within 45 working days of that decision. At NASA's request, the time periods in Stips. II.A.2. and II.A.4. will run concurrently. In exceptional circumstances NASA may request accelerated consideration under Stip. II.A.4. and the Council will make a good faith effort to accommodate such requests. The Council may consult with the National Park Service of the Department of the Interior during its review period.

B. The Council and the NCSHPO recognize that operational emergency situations may arise where NASA must take immediate action without prior consultation with the appropriate SHPO or the Council. In such situations, NASA shall notify the Council and the SHPO of such actions as soon as practicable.

III. Mitigation

Mitigation measures shall be carried out prior to undertaking actions specified in Stips. I.A. and I.B.

A. Recordation

1. Recordation shall be done in accordance with the Secretary of the Interior's "Standards for Architectural and engineering Documentation" (Standards) (Federal Register, 48 FR 190, pp. 44730-44734, September 29, 1983).

2. Because original "as-built" drawings and other records are on file at the installations containing Landmark facilities, documentation will normally include the following: (1) reproduction of existing "as-built" drawings and site plans modified on standard size (19 x 24 or 24 x 36) mylar; and (2) provision of black and white archival quality photos with large format negatives of exterior and interior views, as appropriate, as well as special technological features or engineering details.

3. Original copies of all documentation shall be provided to the Secretary of the Interior in accordance with the Standards for incorporation into the National Architectural and Engineering Records in the Library of Congress as provided in Section 101 of the National Historic Preservation Act and implementing procedures. Copies of the documentation shall also be provided to the appropriate SHPO.

B. Salvage

NASA will apply its agreement with the Smithsonian Institution (NASA Management Instruction 4310.4) to determine appropriate retention and curation activities with respect to significant artifacts.

IV. Continuing Coordination

A. On or about December 1, 1990, and annually thereafter, NASA will provide a summary of its activities under this Agreement to the Council and to the NCSHPO.

B. In consultation with the appropriate SHPO, the Council may review and comment upon individual undertakings when it determines that historic preservation issues warrant such action.

C. NASA will provide appropriate public information about activities under Stip.I.A. to interested parties upon request.

D. Any party to this Agreement may terminate it by providing 60 days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination.

Execution of this Programmatic Agreement and carrying out its terms evidences that NASA has afforded the Council and the NCSHPO a reasonable opportunity to comment on its programs affecting Landmarks under Sections 106 and 110(f) of the National Historic Preservation Act, and that NASA has taken into account the effects of its programs on these Landmarks.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

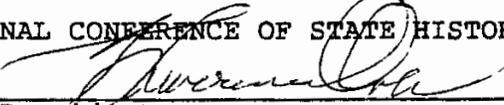
By:


Associate Administrator
for Management

9/29/89
Date

NATIONAL CONFERENCE OF STATE HISTORIC PRESERVATION OFFICERS

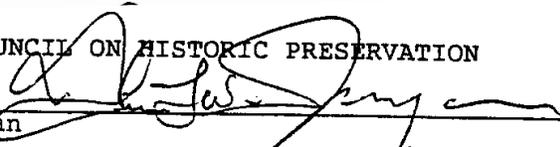
By:


President

10/6/89
Date

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By:


Chairman

September 18, 1989
Date

NASA's NATIONAL HISTORIC LANDMARKS

(as of 2/24/89)

1. Variable Density Tunnel (Langley Research Center, Hampton, VA)
2. Full Scale Tunnel (Langley Research Center, Hampton, VA)
3. Eight-Foot High Speed Tunnel (Langley Research Center, Hampton, VA)
4. Unitary Plan Wind Tunnel (Ames Research Center, Moffett Field, CA)
5. Rocket Engine Test Facility (Lewis Research Center, Cleveland, OH)
6. Zero-Gravity Research Facility (Lewis Research Center, Cleveland, OH)
7. Spacecraft Propulsion Research Facility (Lewis Plum Brook Operations Facility)
8. Redstone Test Stand (George C. Marshall Space Flight Center, AL)
9. Propulsion and Structural Test Facility (George C. Marshall Space Flight Center, AL)
10. Rocket Propulsion Test Complex (Stennis Space Center, MS)
11. Saturn V Dynamic Test Stand (George C. Marshall Space Flight Center, AL)
12. Lunar Landing Research Facility (Langley Research Center, Hampton, VA)
13. Rendezvous Docking Simulator (Langley Research Center, Hampton, VA)
14. Neutral Bouyancy Space Simulator (George C. Marshall Space Flight Center, AL)
15. Space Environment Simulation Laboratory (Lyndon B. Johnson Space Center, Houston, TX)
16. Spacecraft Magnetic Test Facility (Goddard Space Flight Center, Greenbelt, MD)
17. Twenty-Five-Foot Space Simulator (Jet Propulsion Laboratory, Pasadena, CA)
18. Pioneer Deep Space Station (Goldstone Deep Communications Complex, CA)
19. Space Flight Operations Facility (Jet Propulsion Laboratory, Pasadena, CA)
20. Apollo Mission Control Center (Lyndon B. Johnson Space Center, Houston, TX)

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Chapter 25—Aboveground Storage Tanks

For the bulk storage of oils and petroleum-based fuels only

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes policy and procedures and assigns responsibilities for the installation, use, maintenance, and emergency response related to both indoor and outdoor equipment and systems that utilize aboveground bulk storage containers also known as aboveground storage tanks (ASTs).

All Glenn Research Center (GRC) tenant, resident support service contractor employees, and construction contractors involved in the use of ASTs and their contents are to be informed that their lives and health may depend on their knowledge of the fuels and oils they work with. These responsibilities include proper handling procedures, the requirements of wearing appropriate protective clothing and equipment as required, the awareness of the consequences of a release or spill from ASTs, and the measures to prevent such occurrences.

2.0 APPLICABILITY

This chapter is applicable to all personnel who utilize either indoor and/or outdoor ASTs of 55 gal and/or larger to store bulk amounts of oils such as lube oils, hydraulic oils, used oils, and cooking oils. This chapter is also applicable to the bulk storage of petroleum-based products such as diesel fuel, jet fuel, unleaded gasoline, and E-85 ethanol located at GRC sites and to any NASA-controlled, Government-owned facilities associated with GRC. This includes mobile fuel dewars and transfer tanks as well as mobile backup generators. For the purposes of this chapter, the term AST includes all bulk storage containers of 55 gal and larger of oil or fuel as listed in this section. Oil-filled operating equipment (i.e., hydraulic and lube systems), electrical equipment (i.e., transformers), and vehicle fuel tanks for purposes solely for operation of the vehicle are exempt from the policies set forth in this chapter. The Center's approved Spill Prevention Control and Countermeasures (SPCC) plan located within the respective Center's integrated contingency plan (ICP) shall be referenced for requirements pertaining to those exempt systems.

3.0 BACKGROUND

Originally published in 1973 under the authority of Section 311 of the Clean Water Act, the Oil Pollution Prevention regulations set forth requirements for prevention of, preparedness for, and response to oil discharges at specific nontransportation-related facilities. To prevent oil from reaching navigable waters and adjoining shorelines, and to contain discharges of oil, the regulation requires these facilities to develop SPCC plans and establish procedures, methods, and equipment requirements.

4.0 POLICY

It is GRC policy to follow the requirements and recommendations of all relevant Federal, state, and local regulations applicable to ASTs. The complete regulatory texts should be consulted for further details. The following are the authorities that presently regulate ASTs at GRC and are incorporated here by reference.

1. Flammable and Combustible Liquid Standard 29 Code of Federal Regulations (CFR) 1910.106
 - a. The Occupational Safety and Health Administration (OSHA) has enacted regulations applicable to flammable and combustible liquids used in the workplace. These regulations specify the special precautions that shall be taken to ensure that flammable and combustible liquids are handled and stored safely.
2. National Fire Protection Association (NFPA) Codes 30 and 30A

- a. These codes apply to the storage, handling, and use of flammable and combustible liquids, including waste liquids. NFPA Code 30A applies to the use of ASTs at motor fuel dispensing facilities, fleet vehicle motor fuel dispensing facilities, and aircraft refueling.
3. National Pollutant Discharge Elimination System (NPDES)/Storm Water Permit Regulations 40 CFR 122
 - a. This regulation requires a permit for storm water runoff. It addresses pollution in precipitation runoff that is discharged from certain industrial sites, construction sites disturbing an area of 1 acre or more, and urban storm sewers.
 - b. Regulations are applicable to releases of contaminated rain or snow melt from secondary containments into navigable waters of the United States.
4. Ohio Fire Code, Chapter 28
 - a. The Ohio Fire Code addresses prevention, control, and mitigation of dangerous conditions related to the storage, use, dispensing, mixing, and handling of flammable and combustible liquids.
 - b. The code is applicable to the permit process used by the state Fire Marshal for tanks that are installed, removed, repaired, or altered in any way.
5. Oil Pollution Prevention, 40 CFR 112
 - a. This regulation is applicable to facilities with over 1320 gal of aboveground oil storage capacity and determined by counting only containers of oil with capacities of 55 gal or greater.
 - b. Facilities subject to this rule must prepare and implement a plan to prevent any discharge of oil into or upon navigable waters of the United States or adjoining shorelines.
 - c. This rule provides the policies and procedures to prevent, control, and administer countermeasures to oil spills.
6. OSHA, Hazard Communication Standard 29 CFR 1910.1200
 - a. This standard mandates that employees have both a need and a right to know the hazards and identities of the chemicals they are exposed to when working. They also need to know what protective measures are available to prevent adverse effects from occurring.
 - b. The standard is applicable to any chemical that could constitute a health or physical hazard to employees in the workplace.

5.0 RESPONSIBILITIES

5.1 Air Programs Manager

The Air Programs Manager is responsible for GRC compliance with the Title V Permit and ensures all sources of air emissions are documented and permitted as required.

5.2 All GRC Personnel

Any person who discovers a spill at Lewis Field shall immediately notify Emergency Dispatch on a GRC in-house line (911). If using a cellular phone, dial 216-433-8888 and not 911; when at Plum Brook Station, call 419-621-3222.

5.3 AST Program Leads

The AST Program Leads implement and maintain the AST Program at either Lewis Field or Plum Brook Station such that the installations are in compliance with the Oil Pollution Prevention Act and applicable provisions of their respective ICPs.

5.4 Authority Having Jurisdiction

The authority having jurisdiction (AHJ) is responsible for providing review and approval on changes made to facilities and systems that affect fire protection and life safety, including model building and fire code (International Code Council) and local (Ohio Fire Code) requirements. The AHJ has the authority to enforce the fire code where these requirements originate.

5.5 Human Capital Development Branch Chief

The Human Capital Development Branch Chief is responsible for the maintenance of training records of GRC personnel for SATERN-based training sessions.

5.6 Chemical Management Lead

The Chemical Management Lead ensures that the requirements of 29 CFR 1910.1200, the Hazard Communication Standard, and the policies and procedures of GRC are met with regards to the bulk storage of oil of any kind or in any form at either Lewis Field or Plum Brook Station.

5.7 Fuel Distribution Supervisor

The Fuel Distribution Supervisor verifies that employees who are involved in the transfer of fuel at GRC are required to comply with Glenn Work Instruction No. GLWI-CO-6000.001, Revision A. These employees are also required to comply with the applicable provisions of their respective ICPs at either Lewis Field or Plum Brook Station.

5.8 Civil Systems Manager

The Civil Systems Manager assists in verifying that the design aspects related to the modification, replacement, or repair of existing or new AST systems at Lewis Field or Plum Brook Station meet the requirements of their respective ICPs.

5.9 Tank Site Managers

Tank Site Managers are responsible for the operation, maintenance, monthly inspections, and overall management of the ASTs under their use and supervision at either Lewis Field or Plum Brook Station per details outlined in their respective ICPs.

6.0 REQUIREMENTS

6.1 Oil Pollution Prevention (40 CFR 112)

6.1.1 Annual Training

All personnel who utilize, deliver, and store petroleum-based products are required to annually complete the SATERN Course number GRC-006-08 for SPCC and ASTs Training. At Plum Brook Station, the trainings are modified versions of the Lewis Field SATERN modules and are taught via presentations either in class or on an individual's computer.

6.1.2 AST and Piping Integrity Testing

Those AST systems where adequate secondary containment is not feasible shall require nondestructive examination (NDE) per industry standards. Continuous release detection methods (CRDM) along with other passive and active release control measures may be substituted for periodic integrity testing. See Section 6.1.5, Site Spill Response Plan, for additional information.

6.1.3 Operator Monthly AST Inspections

AST operators or designated Tank Site Managers are required to complete monthly inspections of the ASTs under their responsibility. Inspections shall be documented on the SHED-provided site-specific Monthly Inspection Forms

and include indoor, outdoor, tank, or drum requirements and located either at the AST site or other location made known to the AST Program Lead for either Lewis Field or Plum Brook Station. See Appendix B, Sections B.2 and B.3, for examples of the monthly and facility inspection forms.

6.1.4 Secondary Containment

For indoor ASTs, containment shall be adequately sized to contain 100 percent of the maximum storage capacity or documented operating capacity of the AST. For exterior ASTs, containment shall be adequately sized to contain 110 percent of the container plus precipitation if not a double-walled tank. Containments shall be drained on a frequent basis to maintain the required containment capacity.

SHED shall be notified to complete and document the inspection and emptying of secondary containments susceptible to rain and snow accumulations. No GRC personnel shall discharge water accumulations from secondary containments without first receiving SHED approval. All active ASTs with secondary containment drain valves shall be kept in the closed position and locked if feasible.

6.1.5 Site Spill Response Plan (40 CFR 112)

At AST locations where an Impracticability Determination Provision is utilized because of adequate secondary containment not being feasible, the operators of the AST shall prepare a Site Spill Response Plan detailing the commitment of manpower, equipment, along with the actions to be initiated in the event of a major spill or release from the AST System. These plans shall be reviewed and approved by the AST Program Lead at Lewis Field or Plum Brook Station and incorporated in the respective ICP.

6.1.6 Spill Kits (40 CFR 112)

Spill kits shall be onsite and in line of sight of the AST(s) the kit has been designated for. AST operators and/or designated Tank Site Manager are required to supply and replenish these spill kits.

6.2 Fire Protection (29 CFR 1910.1200, 29 CFR 1910.106, NFPA 30A, Ohio Fire Code)

Container grounding and venting shall be implemented as required. The appropriately rated fire extinguisher shall be not less than 10 ft or more than 50 ft from the AST(s). Bollards and other AST protection measures shall be in place prior to use. The location and fire protection requirements of new tanks shall be reviewed by the GRC AHJ.

6.3 Overfill Protection and Spill Buckets (NFPA 30A and 40 CFR 122)

All ASTs that are periodically replenished shall have a direct-view level gauge or built-in flow restrictor, or overfill alarm present to notify or prevent delivery personnel from overfilling the AST. Measures such as a spill bucket shall be present at the fill ports to contain drips and spills during and after deliveries and the detachment of hose connections.

6.4 Permitting (NFPA 30A and Ohio Fire Code Chapter 28, Title V Air Permits)

Permits from the Brook Park Fire Department and/or approval from the GRC AHJ are required prior to tank repairs, modifications, new installations, change in service, and removal.

ASTs containing 600 gal or more of flammable and combustible liquids shall be coordinated with the SHED Air Program Manager for permitting requirements.

6.5 Superfund Amendments and Reauthorization Act (SARA) Reporting

The SHED Operations Team annually requests hazardous material information from the AST Program Lead for the Emergency Planning and Community Right-To-Know Act (EPCRA).

6.6 Tank and Container Signage (29 CFR 1910.1200, Ohio Fire Code)

All ASTs shall be properly labeled with the name of the contents, NFPA placard or label, a unique tank identification (designated by AST Program Lead for Lewis Field or Plum Brook Station), and have emergency contact information where the AST is being stored.

7.0 RECORDS

- Completed annual sets of the monthly AST site inspection forms.—Maintained by the designated Tank Site Manager with past year's records maintained by the respective Center's AST Lead.
- SHED annual AST inspection and/or audit forms.—Maintained by the respective Center's AST Lead.
- Tank Site Manager designation lists and AST database.—Maintained by the respective Center's AST Lead.
- Tank integrity test results where applicable.—Maintained by the respective Center's AST Lead.

8.0 REFERENCES

Document number	Document Name
40 CFR 112	Oil Pollution Prevention
40 CFR 122	National Pollutant Discharge Elimination System (NPDES)/Storm Water Permit Regulations
29 CFR 1910.106	Occupational Safety and Health Administration (OSHA) Flammable and Combustible Liquid Standard
29 CFR 1910.1200	OSHA Hazard Communication Standard
2005 Ohio Fire Code, OAC 1301:7-7-34	Flammable and Combustible Liquids
GLM-QS-8500.1	Environmental Programs Manual, Chapter 8, Spill Control
NFPA Codes 30 and 30A	Flammable and Combustible Liquids, Code for Motor Fuel Dispensing Facilities, Repair Garages, and Aircraft Refueling

APPENDIX A.—DEFINITIONS AND ACRONYMS

Aboveground storage tank (AST).—All containers whether plastic, steel, fiberglass, or other composite with a storage capacity of 55 gal. or larger utilized for the storage of petroleum-based products such as oils, fuels, greases, and coolants. Pressurized vessels of liquid oxygen, nitrogen, and other similar liquid gases are exempt.

Authority having jurisdiction (AHJ)

Bulk storage containers.—Any container used to store oil. These containers are used for purposes including, but not limited to, the storage of oil prior to use, while being used, or prior to further distribution in commerce.

Code of Federal Regulations (CFR)

Combustible liquid.—A liquid having a cup flash point at or above 100 °F and subdivided as follows:

- Class II, liquids having a closed-cup flash point at or above 100 °F and below 140 °F
- Class IIIA, liquids having a closed-cup flash point at or above 140 °F and below 200 °F
- Class IIIB, liquids having a closed-cup flash point at or above 200 °F

Continuous release detection method (CRDM).—Means of detecting a release of liquid through inherent design. It is a passive measure as it does not require sensors or power to operate. Liquid releases are visually detected by facility operators. Secondary containment is considered a widely accepted CRDM system.

Double-walled interstice.—The space between the primary tank and the secondary tank to prevent a release from the primary tank from entering the environment. Most have a sight glass or separate level gauge for detecting a release in the interstice.

Emergency Planning and Community Right-to-Know Act (EPCRA)

Flammable liquid.—A liquid having a closed-cup flash point below 100 °F, and are further categorized into a group known as Class I liquids. The Class I category is subdivided as follows:

- Class IA, liquids having a flashpoint below 73 °F and a boiling point below 100 °F
- Class IB, liquids having a flashpoint below 73 °F and a boiling point at or above 100 °F
- Class IC, liquids having a flashpoint at or above 73 °F and a boiling point below 100 °F

Glenn Research Center (GRC)

Glenn Work Instruction (GLWI)

Impracticability determination provision.—Per Spill Prevention Control and Countermeasures guidelines, when a facility owner or operator is incapable of installing secondary containment by any reasonable method.

Integrated contingency plan (ICP).—Plan intended to be used by facilities to prepare emergency response plans for responding to releases of oil and nonradiological hazardous substances. The ICP creates one functional emergency response plan by consolidating plans necessary to comply with multiple regulations.

National Fire Protection Association (NFPA).—The mission of the NFPA is to reduce the worldwide crisis of fire and other hazards on the quality of life by providing and promoting codes and standards.

National Pollutant Discharge Elimination System (NPDES)

Ohio Administrative Code (OAC)

Oil.—Oil of any kind or in any form, including but not limited to fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil.

Nondestructive examination (NDE).—The development and application of technical methods to examine materials and/or components in ways that do not impair future usefulness and serviceability in order to detect, locate, measure, interpret, and evaluate flaws in the shell of a tank.

Oil-filled equipment.—Oil-filled electrical, operating, and manufacturing equipment, excluding bulk storage containers. Examples of oil-filled operational equipment include hydraulic systems, lubricating systems (including lubricating systems for pumps, compressors, and other rotating equipment), gear boxes, machining coolant systems, heat transfer systems, transformers, other electrical equipment, and other systems containing oil to enable operation.

Safety, Health and Environmental Division (SHED)

Superfund Amendments and Reauthorization Act (SARA)

System for Administration, Training and Educational Resources for NASA (SATERN)

Spill Prevention Control and Countermeasure (SPCC) plan.—Facilities subject to 40 CFR 112 must prepare and implement a plan to prevent any discharge of oil into or upon navigable waters of the United States. The SPCC is incorporated into the respective ICPs for both Lewis Field and Plum Brook Station.

Tank integrity test.—Test of the shell integrity of the aboveground storage tank by several different means including ultrasound, water tightness, smoke tests, and certified visual inspection following industry standards. All tests are to detect weaknesses in the tank shell or signs of excessive corrosion and tank shell loss.

Tank Site Manager.—The Tank Site Manager is responsible for the operation, maintenance, and overall management of the aboveground storage tanks under their use and supervision.

APPENDIX B.—EXAMPLES OF FORMS

B.1 Example: SHED Annual Aboveground Storage Tank Site Inspection/Audit Forms

NASA Glenn Research Center at Lewis Field
SHED Aboveground Storage Tank/Drum Annual Inspection Form

Date of Inspection: _____ SHED Inspector Name: _____

Building No. and Description: _____

Tank ID or Drum Location: _____

Tank, Drum, and Piping Related:	Yes	No	NA
1. NFPA Label, Unique ID, and Tank Content Labeling exist and are appropriate for the product stored?			
2. Tank level gauge is present and is operating or reading tank levels correctly?			
3. Double walled tanks are free of liquid in the interstice?			
4. Spill baskets on fill ports are free of product, water, and debris?			
5. Tank vents appear unblocked by insect nests, other obstructions and are free of damage?			
6. The tank is free of excessive corrosion, distortion, and dents or bulging?			
7. The tank is free of signs of leaks, drips, or a potential for release?			
8. The associated piping is free of leaks, damage, wet fittings, bowing, or excessive corrosion?			
9. Tank foundation is free of settling, cracks, or damage by plant roots?			
10. Tank access free of obstructions and ladders and supports are in satisfactory condition?			
11. Drums are labeled with contents?			
12. Drums are undamaged, free of corrosion and lids or ports are securely fastened?			
Containment Related:	Yes	No	NA
13. Secondary containment is free of damage or breaches in the containment wall, berm or curbing?			
14. Drums are in appropriately sized containments or placed on adequately sized spill pallets?			
15. Secondary containment drain valve is operational and kept in the closed position?			
16. Secondary containment is free of product, water, and/or debris?			
17. Secondary containment is free of equipment or containers that may reduce the size of the containment?			
18. Hazardous or incompatible chemical or product storage is not present in the same containment?			
19. Spill containments with bladders are free obstructions and undeployed?			
Spill / Fire Response Related:	Yes	No	NA
20. Spill Kit is in-line-of-sight of tank or drums and adequately stocked?			
21. Spill kit ID matches EMB records for the site?			
22. Fire Extinguisher is within 30 feet of site and in-line-of-sight or a sign is posted to its location?			
23. Emergency contact information is posted in the building and available to all personnel?			
Operator Related:	Yes	No	NA
24. Operator is completing monthly inspections properly and is keeping them on-site?			
25. Operator is addressing leaks, damage, or other noted concerns in a prompt manner?			
26. Operator has notified EMB of changes in use of the tank, major repairs, or major modifications?			
27. Operator has notified EMB of new tanks or drum storage requirements and locations?			

See reverse side for additional comments/findings as needed.

Latest Revision Date: 1/08/2009

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Printed copies are uncontrolled and may not reflect current information.

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<http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>

B.2 Example: Monthly Inspection Form all ASTs at Lewis Field and Only Outdoor ASTs at Plum Brook Station

NASA Glenn Research Center at Lewis Field

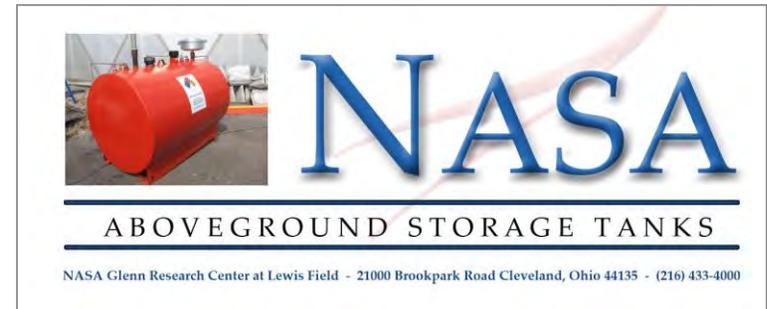
Aboveground Petroleum Storage Tank

Monthly Inspection Form:

Tanks to be inspected:

- AST-XXX
- 55 gallon drums

Attention Designated Tank Inspector: Please answer YES (Y or ✓) or No (N or X) for the following questions and state corrective actions to be taken for those items marked with an **N** or **X**. Please add your initials in the last box with the corrective actions required. Use the reverse side of this form to notate concerns/observations.



Date	Spill Kit Present and Stocked?	Fire Ext. Present?	Tank and drums are free of leaks, corrosion, and bowing?	Supply and return piping and connections are free of leaks, corrosion, and bowing?	Tank foundation and supports are free of cracks, settling, and corrosion?	Secondary containments are free of damage, product, and debris?	Tank level gauges, or high level alarms are in good working condition?	Tank Labels and NFPA Placards Present?	Corrective Actions and Inspector Initials

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Keep this document at the tank site at a designated area for the Environmental Management Branch collection.
Contact SHED at 3-8441 or 3-8764 for questions regarding this document or the tanks being inspected.

B.3 Example: Excerpt of the Indoor Monthly AST and Drum Inspection Form Utilized at Plum Brook Station

SPF Facility (INTERNAL) Safety Inspection Checklist						
Building Number: 1411			Date: _____			
23.0 Hazard Communication Program (29 CFR 1910.1200)						
	23.0 Are MSDS available for the chemicals present?	Yes	No	N/A	SC	Location/Comments
HA02	23.0 Are MSDS available for the chemicals present?					
HA03	23.0 Are chemicals properly stored in properly labeled containers?					
I Spill Prevention, Control & Countermeasure (40 CFR 112.8 (c) (6))						
	(c) (6)	Yes	No	N/A	SC	Location/Comments
	Visual inspection of oil containers, Note: This includes all oil containers over 55-gallons, specifically hydraulic units and drums.					Cooler, Beach Russ Room, Boiler Room
OC01	Is the container free of visible leaks?					
OC02	Are container labels adequate and visible? (Note: Labels include the name and hazard characteristics of the oil stored inside.)					
OC03	Is container free of rust, corrosion and other damage?					
	Visual inspection of secondary containment (Note: These items are not applicable to hydraulic units.)					
OC04	Is adequate secondary containment present? (Note: Secondary containment must have a large enough volume to contain the entire contents of the largest container within.)					
OC05	Is containment free of cracks, corrosion and other damage?					
ADDITIONAL COMMENTS:						

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Chapter 26—Medical Waste Management

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes the policy and procedures and assigns the responsibilities necessary for the management of infectious wastes (IW) at the NASA Glenn Research Center (GRC). All generators of IW must be aware of the current policies and procedures and the impact that they have on their operations.

2.0 APPLICABILITY

This chapter applies to all organizational elements of GRC Lewis Field (LF) and Plum Brook Station (PBS). The guidance provided in this chapter is applicable to GRC employees and support service contractors at all levels who in any way participate in the development and execution of NASA actions. This includes, but is not limited to, biological research laboratories, Medical Services Office, personal usage, and spill response. Employees can refer to Chapter 11, Bloodborne Pathogens, of the Occupational Health Manual (OHM) to determine their roles and responsibilities on personal usage and potential need to participate in the Bloodborne Pathogen Program.

3.0 BACKGROUND

3.1 What is an Infectious Waste?

In Ohio, IW is defined by categories. Nearly all of the categories of IW depend upon the presence of infectious agents or the possibility of the presence of infectious agents. The exceptions to this are blood and blood products, cultures, and sharps categories, which the generator must handle as an IW. IW categories are listed below:

- Cultures and stocks of infectious agents and associated biologicals. This includes specimen cultures, cultures and stocks of infectious agents, wastes from the production of biologicals, and discarded live and attenuated vaccines.
- Laboratory wastes that were, or are likely to have been, in contact with infectious agents that may present a substantial threat to public health if improperly managed.
- Pathological wastes, including human and animal tissues, organs, and body parts, and body fluids and excreta that are contaminated with, or are likely to be contaminated with, infectious agents.
- Waste materials from the rooms of humans or animals that have been isolated because of diagnosed communicable disease that are likely to transmit infectious agents.
- Human and animal blood specimens and blood products that are being disposed of, provided that, with regard to blood specimens and blood products from animals, the animals were or are likely to have been exposed to a zoonotic of infectious agent. ~~“Blood products”~~ does not include patient care waste such as bandages or disposable gowns that are lightly soiled with blood or other body fluids, unless they are soiled to the extent that the generator determines that they should be managed as IW.
- Contaminated carcasses, body parts, and bedding of animals intentionally exposed to infectious agents from zoonotic or human diseases during research, production of biologicals, or testing or pharmaceuticals, and carcasses and bedding animals otherwise infected by zoonotic or infectious agents that may present a substantial threat to public health if improperly managed.
- Sharps wastes used in the treatment or inoculation of human beings or animals. Also, sharp wastes that have, or are likely to have, come into contact with infectious agents in medical, research, or industrial laboratories. Sharp wastes include, but are not limited to, hypodermic needles, syringes, scalpel blades, and glass articles that have been broken.
- Any other waste materials generated in the diagnosis, treatment, or immunization of human beings or animals, research pertaining to the immunization of human beings or animals, or in the production or

testing or biologicals, that the public council identifies as IW after determining that the wastes present a substantial threat to human health when improperly managed because they are contaminated with, or likely to be contaminated with, infectious agents.

- Any other waste materials designated by the generator to be IW.

3.2 Who Regulates the Disposal of Infectious Waste?

The Ohio Environmental Protection Agency's (OEPA) Infectious Waste Program regulates the generation, treatment, packaging, storage, transportation, and disposal of IW in the state. The detailed requirements can be found in Ohio Administrative Code (OAC) Chapters 3745-27 and 3745-37, and in Ohio Revised Code (ORC) Chapter 3734. These regulations contain standards for generators, transporters, and treatment facilities.

3.3 How Do We Recognize Infectious Wastes?

IWs (other than "sharps") are to be placed in red or conspicuously labeled plastic bags labeled with the international biohazard symbol (see Figure 3.1). The international biohazard symbol must be a minimum of 5 inches in diameter. Sharps are to be placed in a sharps container. Sharps containers shall be only those containers specifically designed and manufactured for the management and/or disposal of sharps. Sharps containers are to be labeled with the word "SHARPS" and shall be conspicuously labeled with the international biohazard symbol. If you believe that a container is labeled incorrectly, call and inform the Contractor Waste Manager (WM).



Figure 3.1.—International Biohazard Symbol.

4.0 POLICY

It is the policy of GRC to comply with all local, State, and Federal regulations governing the generation, storage, shipment, and disposal of medical waste.

5.0 RESPONSIBILITIES

5.1 Contractor Waste Manager/Waste Management

The Contractor Waste Manager will ensure all applicable local, State, and Federal regulations are followed. The WM will provide tracking numbers for all IW shipments and maintain copies of the manifests in their office along with copies of the Monthly Infectious Waste Generation Logs (MIWG logs), see Appendix D, supplied by NASA Occupational Medicine Services (OMS). The WM will take all IW collected from biological labs via the Waste Disposal Request form (NASA C260a) to OMS.

The WM will receive training as necessary for the oversight of Infectious Waste Support Service Contractors. Documentation that the training listed below has been administered will be kept as part of the individual's training records.

5.2 Waste Handling Area User

Waste Handling Area Users are personnel whose normal job duties require them to periodically place waste at an IW accumulation area in their normal work location. Because of the large amount of Waste Handling Area Users associated with specific waste sites and the limited amount of training required for them, GRC LF has determined

that the most feasible action is to develop a short training program to train these users in safety and procedural issues. This program is designed to supply the users with the necessary amount of training so that they may identify IW, recognize the hazards associated with IW, respond to a release in accordance with the contingency plan, and perform standard procedures at waste sites. Content of the program includes basic IW hazards, release prevention and response, and standard procedures. Please see Section 6.8 for training specifics.

6.0 REQUIREMENTS

6.1 Large Quantity Generator (*OAC 3745-27-30 and 3745-27-36*)

A large quantity generator generates 50 pounds or more of IW per calendar month. As a large quantity generator of IW, GRC must

- Register as a large quantity generator of IW in the State of Ohio every 3 years.
- Segregate wastes at the point of generation, and handle and package them appropriately.
- Ship untreated IW to a licensed treatment facility by a licensed transporter prior to disposal.
- Provide information on the major components of the facility's IW, any method of treatment of the wastes to render them non-infectious, and the system for distinguishing between waste packages that contain treated and untreated waste to persons who agree to transport, treat, or dispose of the waste, upon a written request from those persons.
- Use properly completed shipping papers.
- Develop and implement a Spill Containment and Clean-Up Procedure.
- May file a "Reversion to Small Generator form" with the Division of Solid and Infectious Waste OEPA at least 30 days prior to expiration of the current waste certification if GRC can show less than 50 pounds of IW has been generated consistently over time.

6.2 Small Quantity Generator (*OAC 3745-27-30 and 3745-27-36*)

A small quantity generator generates less than 50 pounds of IW per calendar month and must handle IW as follows:

- All IW, except untreated specimen cultures or cultures of infectious agents, may be disposed of, untreated, as solid waste, (i.e., normal trash).
- Specimen cultures and cultures of infectious agents must either be treated onsite by an approved IW treatment method or taken by a registered transporter to a licensed treatment facility.
- Must keep a record of the amount of IW generated each calendar month. This record is called a Monthly Infectious Waste Generation Log (MIWG log).

6.3 Guidelines for Waste Handling Area User (*OAC 3745-27-35*)

The following section describes the specific guidelines for IW disposal at GRC:

1. Segregate waste at the point of generation. Normal solid waste should be separated from IW. IW should be separated from hazardous waste. Hazardous waste mixed with IW must be disposed of as a hazardous waste.
2. Collection boxes (supplied by the IW disposal facility) with red liners will be kept in the patient areas. Separate boxes will be maintained for the sharps containers. Sharps boxes must be lined with red bags and kept covered at all times.
3. Discard all contaminated and uncontaminated needles, syringes, disposable scissors, tweezers, razor blades, sutures, blood tubes, etc., in the sharps collection container located in each patient care room. To avoid accidental skin puncture, do not recap needles. Discard needles immediately and properly. When full, these containers must be sealed and labeled with the (1) date, (2) "NASA Occupational Medicine Services (OMS)," (3) the word "SHARPS," and (4) the international biohazard symbol. Filled containers should be placed in the appropriate collection box for offsite transport.

4. Place all other non-sharp-type waste into the lined receptacle for IW in each patient area. When full, the plastic bag with contents is placed into the appropriate collection box for offsite transport.
5. Contact Medical Services for scheduled pick-up times. Prior to transport, the boxes of IW to be shipped out that day must be weighed. Record the number of boxes and their weight in the MIWG log.
6. Fill out a NASA C260a Waste Disposal Request form for collection boxes each time they are picked up. This form should include the following:
 - a. Number of boxes disposed
 - b. Contents of boxes, (i.e., scrap medical waste consisting of used needles and syringes, used vaginal speculums, soiled bandages and dressings, soiled latex and vinyl gloves, used blood tubes, and used disposable sharps. Sharps containers containing used needles, syringes, and blood tubes should be in a separate box and not mixed with other IW.)
 - c. Signature of the Medical Services Contracting Officer Technical Representative (COTR)
7. WM will pick up the IW from Medical Services and store the IW until the waste hauler comes to GRC for pickup.

6.4 Packaging (OAC 3745-27-34)

Generally, GRC LF must package IW to meet the following requirements:

- IW must be placed in bags that are red in color or conspicuously labeled with the international biohazard symbol. Each bag must be constructed of material of sufficient thickness and strength to preclude ripping, tearing, or bursting, and must be leak resistant.
- IW bags must be impervious to moisture.
- Filled bags must be securely tied or sealed to prevent leakage or expulsion of wastes from them during storage, handling, or transport.
- Bags containing IW being transported off GRC LF premises must be placed inside a second sealed plastic bag, or within a fully enclosed, rigid, and sturdy container. Containers shall be in good condition, and at a minimum, be labeled with the international biohazard symbol on two opposite sides.
- IW sharps containers must be rigid, puncture resistant, leak resistant, and closed tightly to prevent loss of contents. Sharps containers must be only those containers specially designed and manufactured for the management/disposal of sharps.
- IW containers must be handled in a manner and location that maintains the integrity of the packaging.
- Outside storage areas containing IW must be locked to prevent unauthorized access.
- IW storage areas are to be designated with the words “Warning: Infectious Waste” and/or displaying the international biohazard symbol at all points of access.
- Any spill of IW must be contained and cleaned up according to prescribed process in Section 6.7.
- IW must be maintained in a nonputrescent state, using refrigeration or freezing when necessary.
- IW must be maintained in a manner that affords protection from animals, insects, and rodents.

6.5 Shipping Paper System/Transportation (OAC 3745-27-31 and 3745-27-33)

A treatment shipping paper shall accompany the shipment of untreated IW. The treatment shipping paper shall be used when a shipment is transported to an IW treatment facility that is not owned or operated by GRC. The treatment shipping paper must be produced from a form prescribed by or approved by the OEPA as described in OAC Chapter 3745-27-33. Each shipping paper will have a unique tracking number assigned by SHED.

6.6 Waste Transportation (OAC 3745-27-31 and 3745-27-36)

Only transporters who are registered with the OEPA to transport untreated IW off the premises where they are generated may transport IWs offsite. Generators of IW must also obtain a transporter registration to transport IWs

off the premises where they are generated. All IW transported offsite must be accompanied by a shipping paper that meets a form prescribed by or approved by the OEPA, and also meets the requirements of OAC Chapter 3745-27-33.

6.7 Spill Containment and Cleanup (OAC 3745-27-30 and 3745-27-35)

Cleanup materials and spill kits must be available in those areas designated in the spill containment and cleanup procedures. Spill kits are to contain specific items described in OAC Chapter 3745-27-30(B) (11).

A Spill Containment and Clean-Up Procedure must be available on the premises for persons likely to handle IW. It must include at the top of the procedure the name, address, and telephone number of the IW Control Manager and their backup, along with the location of all spill containment and materials/kits at the location. Copies of the procedure must be provided at the request of the board of health with jurisdiction or the Director of the OEPA or their authorized representative. Appendix B is a sample procedure that may be adopted for use.

JDD is responsible for all spill cleanups at NASA GRC LF. JDD, Inc., will take all IW to the OMS Office with a completed Medical Waste Disposal Form, see Appendix C.

The Operations and Maintenance contract at PBS shall be responsible for all spill cleanups. Only workers with Bloodborne Pathogen training shall be allowed to perform this duty. The Operations and Maintenance personnel shall place the waste inside a red conspicuously labeled bag with the international biohazard symbol following the packaging requirements detailed in Section 6.4 and deliver the waste to building 9206. This bag shall be placed inside a rigid, sturdy container. Building 9206 shall then be marked with the words “Warning: Infectious Waste,” displaying the international biohazard symbol at all points of access. The Operation and Maintenance contractors shall then complete a Waste Disposal Request (C260a) notifying WM of the material generated. WM shall coordinate the disposal of the IW and provide copies of the manifest to the Environmental Manager at PBS.

6.8 Training (29 CFR 1910.1030)

To ensure compliance with the OAC Chapters 3745-27 and 3745-37 and ORC 3734, each employee responsible for proper disposal of IW shall be informed of provisions of the OEPA’s Infectious Waste Program. Training will be conducted by a person familiar with the applicable regulations of IW. The training course shall include instruction, which teaches facility personnel IW procedures (including, but not limited to, contingency plan implementation) relevant to the positions in which they are employed.

TABLE 6.1.—TRAINING REQUIREMENTS

Job Title	Training Requirements	Locations
Waste Handling Area Users	Personal safety, release prevention and response, facility operations, Bloodborne Pathogens	In-house training
Contractor Waste Manager/ Waste Management (WM)	Personal safety, release prevention and response, facility operations, Bloodborne Pathogens, RCRA, DOT, documentation	Off-site training

7.0 RECORDS

Copies of shipping papers will be maintained by both GRC and the waste treatment/disposal facility.

Minimum retention time for these documents is 3 years. Records for LF will be maintained by WM in the Central Chemical Storage Facility (CCSF), building 215, and records for PBS shall be maintained in the office of Environmental Manager.

Training records will be kept with all other training that the individual has received and will be kept in their company’s office onsite at NASA GRC at LF.

8.0 REFERENCES

Document number	Document name
Ohio Administrative Code (OAC), Chapter 3745-27	Solid and Infectious Waste Regulations

OAC, Chapter 3745-37	Solid Waste, Infectious Waste Treatment, and Construction & Demolition Debris Facility Licenses
Ohio Revised Code, Chapter 3743	Solid and Hazardous Wastes
Occupational Safety and Health Administration, 29 CFR 1910.1030	Toxic and Hazardous Substances: Bloodborne Pathogens
Occupational Health Manual, Chapter 11	Bloodborne Pathogens

APPENDIX A.—DEFINITIONS AND ACRONYMS

Central Chemical Storage Facility (CCSF).—Building 215

Contractor Waste Manager.—Lead person for the Infectious Waste Manager Support Service Contractors and is responsible for that contractor's daily infectious waste operations at GRC.

Contracting Officer's Technical Representative (COTR)

Department of Transportation (DOT)

Glenn Research Center (GRC)

Infectious agent.—Type of microorganism, helminthes, or virus that causes, or significantly contributes to the cause of increased morbidity or mortality of human beings.

Infectious waste (IW).—Infectious waste is defined by categories. Nearly all of the categories of infectious waste depend upon the presence of infectious agents or the possibility of the presence of infectious agents. The exceptions to this are blood and blood products, cultures, and sharps categories, which the generator must handle as an infectious waste.

Infectious Waste Handling Area.—Any area where infectious wastes are stored, loaded, unloaded, prepared for treatment, or treated. Infectious waste handling areas also include areas where vehicles or containers are decontaminated, areas where transportation of infectious wastes within the facility premises occurs, and areas where treated infectious wastes are unloaded, stored, and loaded.

Infectious Waste Service Support Contractor.—Singleton Health Services, LLC, and JDD, Inc., janitorial and specialized cleaning services are responsible for the daily management of infectious waste at GRC.

Lewis Field (LF)

Monthly Infectious Waste Generation Log (MIWG log)

Ohio Administrative Code (OAC)

Ohio Environmental Protection Agency (OEPA)

Occupational Medicine Services (OMS)

Ohio Revised Code (ORC)

Plum Brook Station (PBS)

Resource, Conservation and Recovery Act (RCRA)

Sharps.—Sharps that have been used in animal or human patient care or treatment or in medical, research, or industrial laboratories. These include hypodermic needles, syringes (with or without the attached needle), pasteur pipettes, scalpel blades, blood vials, needles with attached tubing, and culture dishes (regardless of presence of infectious agents). Also included are other types of broken or unbroken glassware that were in contact with infectious agents, such as used slides and cover slips.

Safety, Health and Environmental Division (SHED)

Treatment Shipment Paper.—A list or record of the infectious wastes being transported. May be prepared by the generator, the transporter, or the Waste Treatment Facility.

Waste Handling Area User.—Personnel whose normal job duties require them to periodically place waste at an infectious waste accumulation area at their normal work location.

Waste Management (WM)

APPENDIX B.—SPILL CONTAINMENT AND CLEAN-UP PROCEDURE

Medical Waste Control Manager: _____
(name, phone, and address)

Alternate: _____
(name, phone, and address)

Facility: _____

Location of Spill Kit(s): _____

**NASA Glenn Research Center
Occupational Medicine Services
21000 Brookpark Road M.S. 15-5
Cleveland, Ohio 44135**

The following procedure shall be implemented subsequent to a spill of infectious waste or its discovery:

1. The clean-up crew shall utilize appropriate personal protective equipment including liquid impermeable and disposable overalls, gloves, boots, caps, and protective eyewear. The protective equipment shall be located in the spill containment and clean-up kit.
2. Limit access to the spill area only to authorized personnel.
3. Place broken containers and spillage inside overpack bags in the spill containment and clean-up kit, minimizing exposure.
4. Disinfect the area and take other clean-up steps deemed appropriate. Disinfectants used in the cleaning-up a spill shall be registered with the U.S. Environmental as hospital disinfectants that are also tuberculocidal, fungicidal, virucidal, and effective against HIV-1, or a ten percent volume/volume sodium hypochlorite solution. Any absorbent material used to disinfect the area shall be considered infectious waste.
5. Clean and disinfect non-disposable items.
6. Remove protective equipment and manage disposable items as infectious waste.
7. Complete the Medical Waste Disposal Form (Appendix C) and give it to OMS.
8. Call the Industrial Hygiene Team (IHT) for reopening of the area where the release occurred.
9. Call for emergency assistance as needed from the fire department, police department, local health department, local emergency management office, or the Ohio EPA.

APPENDIX C.—MEDICAL WASTE DISPOSAL

Occupational Medicine Services
NASA Glenn Research Center
21000 Brookpark Road MS 15-5
Cleveland OH 44135
Phone 216-433-5841
Fax 216-433-6529

Singleton Health Services, L.L.C.

Medical Waste Disposal

Date of Incident: _____ **Time of Incident:** _____

Location of Incident: Building: _____ **Area:** _____

Person Who Cleaned Up Spill: _____

Description of Waste: _____

Quantity	Type of Waste
Total Weight of Waste:	

Person Transporting Bag: _____

Signature: _____ **Date:** _____

Medical Services Witness: _____

Signature: _____ **Date:** _____

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Chapter 24—Storm Water Management Program

NOTE: This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was August 2012. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.

1.0 PURPOSE

This chapter establishes the policies and procedures and assigns responsibilities for all NASA Glenn Research Center (GRC) personnel in the protection of waters of the state by means of pollution prevention measures implemented for storm water runoff and point-source discharges. For Lewis Field, this chapter coincides with and summarizes the requirements of the Ohio Environmental Protection Agency (EPA)-issued National Pollution Discharge Elimination System (NPDES), Phase II Municipal Separate Storm Sewer System (MS4) permit number OHQ000002.

2.0 APPLICABILITY

This chapter is applicable to all personnel whose activities, projects, and/or actions have the potential of adding pollutants into storm water, not limited to sediments, oils, and wash waters that may enter into storm water runoff and waters of the state. Per the Clean Water Act (CWA) of 1972, storm water shall consist entirely of rainwater or snow melt only and to the maximum extent practicable (MEP).

3.0 BACKGROUND

Polluted storm water runoff is a leading cause of impairment to nearly 40 percent of surveyed U.S. water bodies that do not meet water quality standards. Over land or via storm sewer systems, polluted runoff is discharged directly into local water bodies. When left uncontrolled, this water pollution can result in the destruction of fish, wildlife, and aquatic life habitats, a loss in aesthetic value, and threats to public health due to contaminated food, drinking water supplies, and recreational waterways. The CWA of 1972 and the Federal Water Pollution Control Act of 1961 initiated the NPDES permit process that began the process of evaluating larger communities or Phase I communities and the non-point-source pollutants arising from these areas. In 2003, the U.S. EPA took the NPDES permitting process a step further to Phase II to address smaller communities also found to be having a detrimental effect on local waterways.

Lewis Field has been designated by the Ohio EPA as a Small, Nontraditional MS4. This permit required GRC to submit a Storm Water Management Program (SWMP) demonstrating how the Center intends to implement the required six minimum control measures to meet the compliance requirements under the NPDES Phase II general permit over the first 5-year term. The six minimum control measures include (1) Public Education and Outreach, (2) Public Participation and Involvement, (3) Illicit Discharge Detection and Elimination, (4) Construction Site Runoff Control, (5) Postconstruction Runoff Control, and (6) Pollution Prevention and Good Housekeeping. NASA GRC is required to submit an annual report to the Ohio EPA of the progress of the best management practices (BMPs) and measurable goals for each minimum control measure stated in the SWMP.

Though Plum Brook Station is exempt from the storm water policies required of Lewis Field, Plum Brook Station does enforce the construction general permits when applicable and has voluntarily developed a Storm Water Pollution Prevention Plan (SWP3) that coincides with the Plum Brook Station Integrated Contingency Plan (ICP).

4.0 POLICY

It is GRC policy to follow the requirements and recommendations of all relevant Federal, state, and local regulations applicable to storm water pollution prevention. The complete regulatory texts should be consulted for further details. The following are the authorities that presently regulate storm water at GRC and are incorporated here by reference.

4.1 Clean Water Act of 1972–1977 (Originated as the Federal Water Pollution Control Act of 1948)

The CWA is the cornerstone of surface water quality protection in the United States. (The act does not deal directly with ground water or with water quantity issues.) The statute employs a variety of regulatory and nonregulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal waste water treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and

maintaining the chemical, physical, and biological integrity of the Nation's waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."

4.2 Energy Independence and Security Act (EISA) of 2007 (42 United States Code (U.S.C.) 17094), Title IV, Subtitle C, Section 438: Storm Water Runoff Requirements for Federal Development Projects

The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5000 ft² (0.115 acres) shall use site planning, design, construction, and maintenance strategies for the property 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 (storm water runoff).

4.3 National Pollutant Discharge Elimination System (NPDES)/Storm Water Permit Regulations 40 Code of Federal Regulations (CFR) 122

Authorized by the CWA, initially it was strictly a permit program to control water pollution by regulating point sources that discharge pollutants into waters of the United States. Nonpoint discharges became further regulated in the 1990s in Phase I (communities of 10,000 or more) of the permitting program, and in 2003, Phase II for smaller communities (10,000 or less) was enacted.

4.4 Northeast Ohio Regional Sewer District Code of Regulations (NEORS), Title II Pretreatment Regulations

The NEORS Code of Regulations is applicable to any nondomestic user of the public sewer system that discharges substances that may pass through the system or interfere with the operation or performance of the system or may violate any provision of Sections 405 and 406 of the Water Quality Act of 1987 or is engaged in any of the following industrial processes or other processes that may subsequently be added or is otherwise designated by the district.

4.5 Oil Pollution Prevention, 40 CFR 112

This rule provides the policies and procedures to prevent, control, and administer countermeasures to oil spills. It is only applicable to facilities with over 1320 gal of aboveground oil storage capacity and determined by counting only containers of oil with capacities of 55 gal or greater. Facilities subject to this rule must prepare and implement a plan to prevent any discharge of oil into or upon navigable waters of the United States or adjoining shorelines.

5.0 RESPONSIBILITIES

5.1 All GRC Personnel

Any person who discovers a spill or illegal dumping at GRC shall immediately notify Emergency Dispatch on a GRC in-house line (911). If using a cellular phone, dial 216-433-8888 and not 911 when at Lewis Field and 419-621-3222 when at Plum Brook Station. Employees are required to handle, maintain, and store products and equipment in a manner that reduces their potential to the MEP of releasing anything beyond storm water or snow melt into floor drains, storm drains, and/or the environment.

5.2 Human Capital Development Branch Chief

The Branch Chief is responsible for the maintenance of training records of GRC personnel for SATERN-based training sessions.

5.3 Facilities Division (FD)

5.3.1 NASA Building and Facility Managers

Personnel are required to assess their buildings and facilities for potential sources of pollution and ensure personnel in those facilities are conducting business that prevents storm water pollution. Shall assist the illicit discharge detection and elimination (IDDE) team in tracking sources of pollution originating from the buildings they manage.

5.3.2 NASA Civil Systems Manager

The Civil Systems Manager assists in verifying the design aspects related to the modification, replacement, and/or repair of existing or new storm water drainage systems at Lewis Field and Plum Brook Station and assists the IDDE team in tracking and eliminating sources of pollution and cross connections detected in the storm sewer system.

The Civil Systems Manager also verifies design aspects related to submitted Storm Water Pollution Prevention Plans (SWP3s) for projects of 1 acre or larger with emphasis on the inclusion of adequate sediment controls, postconstruction BMPs, flooding controls, and general viability of the plan.

5.3.3 NASA Inspector

Amongst the general responsibilities for daily oversight and the inspection of assigned projects, the assigned NASA inspector shall ensure storm water pollution is being prevented per Center- and project-specific policies. This individual shall document project performance and report all findings to the NASA Project Manager (PM) and NASA Quality Assurance Technician (QAT).

5.3.4 NASA Project Manager

The PM ensures the overall management and the quality of the project activities. This individual shall ensure all project goals and objectives are met in a high-quality and timely manner. The PM has stop work authority and is the Safety, Health and Environmental Division's (SHED's) point of contact for addressing observed storm water noncompliances.

5.3.5 NASA Quality Assurance Technician

The QAT is responsible for project control and implementation of project activities in accordance with the design package. They are also responsible for contractor oversight, adherence to quality assurance, quality control field procedures, and the project's Health and Safety Plan (HASP), coordination with the NASA PM, and field documentation, and the preparation of field change orders, if required. They ensure the contractors and subcontractors on a project are aware and understand the storm water pollution prevention policies of this chapter and/or where required, the SWP3 for the specific project.

5.4 Illicit Discharge Detection and Elimination Team

The IDDE team includes members of the Facilities Division, SHED, the respective building managers, and support service contractors to track permit exceedances as well as oils and other non-storm-water contaminants detected in the discharges originating from facilities and operations of GRC.

5.5 Safety, Health and Environmental Division

5.5.1 Division Chief

The SHED Chief reviews and signs the Ohio EPA Notice of Intent (NOI), Notice of Termination (NOT), and annual report forms for Lewis Field.

5.5.2 Compliance Team

As related to this chapter, this team oversees the reformatting and updating of the Environmental Programs Manual chapters; reviews the regulatory Corrective and Preventive Action Reports (CPARs) issued, provides oversight of training requirements and completion within the System for Administration, Training, and Educational Resources at NASA (SATERN), implements the Center's Environmental Management System, and conducts the internal program evaluation process.

5.5.3 Construction Team

As related to this chapter, includes personnel inspecting demolition and new construction projects to ensure HASPs are in effect and enforced, storm water runoff is not transferring sediment offsite, spill kits are onsite, and overall compliance of the site is understood and being followed.

5.5.4 Facilities Team

As related to this chapter, the facilities team includes personnel who specialize in the management of fuel and oil storage practices, waste water discharges, pesticides and herbicides management, storm water pollution prevention, and overall facility safety.

The Storm Water Program Manager oversees, develops, assigns, and implements requirements of the Lewis Field Storm Water Management Program, reviews submitted SWP3s for construction projects of 1 acre or larger to completion of Ohio EPA checklists, completes monthly inspections of SWP3-designated sites, and is part of the Lewis Field IDDE team.

5.5.5 Operations Team

As related to this chapter, the operations team includes personnel who specialize in spill prevention, control, and countermeasures (SPCC), oil spill response, and occupational health and safety aspects.

5.5.6 Plum Brook Station Team

As related to this chapter, the Plum Brook Station team includes personnel who specialize in the oversight and management of safety, health, and environmental aspects addressed by the other teams, except with direct focus at the Plum Brook Station facility.

5.6 Support Service Contractors

Since more than half of the workforce at GRC are support service contractors (SSCs), these personnel have an important role in the success of the Center to achieve compliance to this chapter. The NASA organizations and SSC supervisors managing the SSC contracts are required to ensure their personnel are aware, understand, and abide to the policies of this chapter.

Note: For Lewis Field, many of the individually listed responsibilities are required per Center policies and originate from the Lewis Field Storm Water Management Plan, which has established many of these responsibilities as acceptable best management practices. Therefore, specific regulatory references are not provided, though they all stem from the requirements to be established to a specific site per 40 CFR 122. In addition, though Plum Brook Station is not required to establish a SWMP, the following responsibilities are practices all shall consider following.

5.6.1 Facilities Maintenance Personnel

- Personnel shall, to the MEP, capture and properly dispose of the byproducts and residual wastes created by their tasks to maintain, upgrade, clean, and/or repair facility infrastructure. Such activities include, but are not limited to the following: building facade power washing and cleaning, grout removal and tuck-pointing, painting, sand blasting, concrete repairs and replacement, underground utility repairs and replacement, and aboveground utility repairs and replacements.
- Disturbed soils shall be seeded and/or mulched if to remain dormant yet disturbed for longer than 21 days. An adequate watering plan is essential for successful seed germination and permanent soil stabilization.
- Stockpiles of soils shall be covered with tarps and/or plastic on the day the soil piles are created to prevent migration of sediments to storm drain.
- Bulk storage of chemicals, fuels, and stockpiles of gravel, mulch, and soil shall be stored at least 10 ft from storm inlets with appropriate spill kits onsite.
- Personnel shall inspect maintenance vehicles and equipment on a routine basis for leaks and deterioration of hoses and seals. SHED highly recommends fuel delivery vehicles have their own spill kits.

5.6.2 Fuel Management and Delivery Personnel

- Personnel shall utilize spill kits and storm drain protection equipment at all times at locations where there is the potential of a fuel or oil spill or leak to enter a storm drain during fuel delivery operations.
- Personnel shall inspect fuel delivery vehicles and associated hoses, nozzles, pumps, and gears prior to each delivery for leaks and/or deterioration and repaired promptly.
- SHED highly recommends fuel delivery vehicles have their own spill kits.

5.6.3 Fleet Vehicle Maintenance and Operations Personnel

- Personnel shall ensure that vehicle maintenance is up to date and that vehicle leaks of coolants, fuels, and oils are promptly corrected and prevented from entering storm drains, including those vehicle residuals migrating from offsite repair garages and refueling stations.
- These facilities shall have designated personnel who visually inspect the site on a monthly basis per the site specific inspection form, well stocked spill kits visibly available onsite, and signs posted detailing emergency fire and spill contact information.

5.6.4 Grounds Personnel

- Personnel who complete landscaping tasks such as grass cutting, leaf pickup, tree pruning and planting, and other facility aesthetic maintenance shall prevent sediments and debris resulting from these activities from entering storm drains, drainage swales, and/or biogardens.
- Disturbed soils shall be seeded, and/or mulched if to remain dormant yet disturbed for longer than 21 days. An adequate watering plan is essential for successful seed germination and permanent soil stabilization.
- Stockpiles of soils shall be covered with tarps or plastic on the day the soil piles were created to prevent migration of sediments to storm drain.
- Bulk storage of chemicals, fuels, and stockpiles of gravel, mulch, and soil shall be stored at least 10 ft from storm inlets with appropriate spill kits onsite.
- Those personnel who apply herbicides, pesticides, and/or fertilizers shall be certified to do so and maintain documentation of the locations and quantities of the products being applied.
 - See Herbicides, Pesticides, and Fertilizer Applications in the Environmental Programs Manual, Chapter 21, Pest Control, for further guidance.
- Gas, oil, and hydraulic equipment such as lawnmowers, chain saws, weed trimmers, and backhoes shall be inspected on a routine basis for leaks and hose deterioration. Any discrepancies shall be repaired promptly.
- SHED highly recommends that spill kits be available on the vehicle and/or equipment at all times.

5.6.5 High-Voltage Personnel

High-voltage personnel shall contact the SHED Storm Water Program Lead or Water Pollution Control Lead prior to discharging water from high-voltage tunnels and manways. When feasible, contact SHED 14 days prior to work in the event the water needs to be containerized and sampled for any of the two reasons:

- Presence of a sheen, pungent odors, and/or noticeable discoloration or suspended solids
- Previous water sampling has indicated the presence of contaminants at levels at or above NEORS D pretreatment limits as stated in Chapter 3 of the NEORS D Title II Pretreatment Regulations

See Section 6.6 of this chapter for detailed requirements.

5.6.6 Janitorial Personnel

- Carpet and floor wash water shall be disposed in building slop sinks and/or toilets only.
- Trash and spent cleaning supplies shall be disposed in their allocated locations and dumpsters.

5.6.7 Tank Site Managers

- Tank Site Manager (TSM) personnel include those designated by SHED or their organizations as providing oversight and monthly inspections of aboveground storage tanks (ASTs), oil-filled operating equipment, 55-gal drums, underground storage tanks (USTs), or other oil or fuel container or equipment.
- TSMs are required to maintain spill kits and secondary containments where applicable, to ensure associated personnel are trained and monthly inspections are completed, and to ensure spills or leaks into floor drains or storm inlets are reported immediately to Emergency Dispatch on a GRC in-house line (911). If using a cellular phone, dial 216-433-8888 and not 911 when at Lewis Field and 419-621-3222 when at Plum Brook Station Dispatch at Lewis Field and the Comm Center at Plum Brook Station.

5.6.8 Road, Walkway, and Parking Lot Deicing Personnel

- Personnel who perform deicing and snow removal activities at GRC shall operate and maintain equipment to prevent disturbance of soils and ensure proper application of deicing materials. These personnel shall inspect equipment for fuel, oil, and other vehicle liquid leaks prior and after use.
- Documentation of the following is required:
 - How and when deicing equipment is recalibrated

- Amounts of salt applied each season
- The salt dome area shall be kept clean of excess salt originating from deliveries and truck loading.
- Areas of over-application shall be spread out or collected for use elsewhere at GRC.
- At end of deicing season, leftover salt shall be swept from roads, walkways, and parking lots to the MEP.

5.7 Outside Contractors and/or Subcontractors

Normally utilized for specific short-term tasks at either Lewis Field or Plum Brook Station, these personnel change frequently and their onsite durations range from a few hours to over several months. The organizations and SSCs who procure and provide these subcontractors access to GRC are responsible for ensuring that these personnel are aware, understand, and abide to the policies of this chapter.

5.7.1 Contractor and Subcontractor Management and Supervision

5.7.1.1 Contractor Project Manager or Equivalent

The Contractor Project Manager (CPM) ensures the overall management and the quality of implementing the contract components of project activities. This individual shall ensure all contractual goals and objectives are met in a high-quality and timely manner. The CPM oversees the Contractor Construction Manager (CCM) duties and communicates any questions, concerns, and/or onsite issues with the NASA QAT. The CPM ensures all personnel at their project site are aware, understand, and abide to the storm water pollution prevention policies of this chapter.

5.7.1.2 Contractor Construction Manager or Equivalent

The CCM is responsible for the implementation of specific contracted components of the project design package. The CCM is responsible for the proper performance of the specified remedial activities in accordance to the project design, adherence to the project specifications and the site health and safety plan, coordination of field personnel activities, and the field documentation. The CCM reports directly to the NASA QAT. The CCM shall be made aware of the storm water pollution policies of this chapter by either the CPM or NASA QAT, and in turn ensure personnel under their supervision are aware of, understand, and abide to the policies of this chapter.

5.7.1.3 Contractor Quality Assurance/Quality Control Officer or Equivalent

The Contractor Quality Assurance/Quality Control (QA/QC) Officer coordinates with the CCM to ensure the requirements of the project design are performed in accordance with the policies of this chapter. When applicable, this individual shall implement the requirements of the SWP3 for the project. The Contractor QA/QC Officer reports directly to the CPM and CCM of all information and decisions reported.

6.0 REQUIREMENTS

6.1 Training

Though completion of formal training regarding storm water pollution prevention is not required at the Center, storm water awareness training regarding this chapter is available for all. This training is a recommended supplement for personnel to obtain an understanding of their responsibilities under the policies of this chapter. The SATERN course number GRC-007-08 for Storm Water Pollution Prevention Awareness is available to all personnel either online through SATERN or through in-class training by request to the Storm Water Program Manager at 216-433-8764.

6.2 Storm Water Runoff Requirements for Federal Development Projects Exceeding 5000 ft²

- [Ohio EPA Guidance Document](#)
- **Option 1: Control of the 95th Percentile Rainfall Event.**—Design, construct, and maintain storm water management practices that manage rainfall onsite and prevent the offsite discharge of the precipitation from the 95th percentile rainfall event. This shall be accomplished by the natural hydrologic processes of infiltration, evapotranspiration, and/or the mechanical process of rainwater harvesting and reuse.

- **Option 2: Hydrologic Analysis.**—Design, construct/implement, and maintain storm water management practices that preserve the predevelopment runoff conditions following construction. The postconstruction rate, volume, duration and temperature of runoff shall not exceed the predevelopment rates. This shall be accomplished by the natural hydrologic processes of infiltration, evapotranspiration, and/or the mechanical process of rainwater harvesting and reuse. Satisfaction of this requirement must be demonstrated through the use of approved hydrology assessment and modeling methods.

6.3 Storm Water Pollution Prevention Plans (SWP3)

6.3.1 Lewis Field Facility SWP3

This plan, as required per the NPDES Permit OHC000002, will require that those facilities at Lewis Field that conduct activities described in 40 CFR 122.26(b)(14) but are not required to obtain Industrial Storm Water General Permit coverage, a SWP3 shall be developed and implemented in accordance with the SWP3 requirements of Ohio EPA's Industrial Storm Water General Permit (OHR000004).

6.3.2 SWP3 for Projects with Soil Disturbance of 1 to 5 Acres and 5 Acres and Larger

All construction, demolition, and associated staging areas that encompass 1 acre or larger are required to have a SWP3 onsite addressing all of the requirements of the Ohio EPA Construction General Permit (CGP) OHC00003.

Ohio EPA's SWP3 [Checklist](#)

- Approval by SHED and complete signoff by all required parties on the NASA Construction SWP3 Concurrence Form (See Appendix B) is required prior to SHED submitting the NOI application to the Ohio EPA.
- [NOI Application Form](#)
- The NOI package to be sent to the Ohio EPA shall include a site map, the completed NOI application form, and a check for the appropriate amount per acreage of disturbance.
- The project's SWP3 does not need to be submitted to the Ohio EPA unless otherwise requested.
- Once the SWP3 is approved, the SHED Division Chief signs the NOI application form and submits the entire NOI package to the Ohio EPA to request coverage under the Construction General Permit (CGP). At Plum Brook Station, the NOI application package is signed and forwarded by the Plum Brook Environmental Manager.
- The Ohio EPA requires a minimum of 21 days to review the NOI and grant permission to NASA.
- The original Ohio EPA NOI permission letter will be maintained by SHED.

This type of SWP3 is developed and supplied by the contractor and/or designer of the project. It shall also include two parts:

- **BMP Site Map.**—Includes a detailed site map showing the boundaries and staging areas of the work project along with all of the BMPs to be utilized to prevent erosion of soils from occurring and sediments from migrating offsite and into waters of the state.
- **SWP3 Binder.**—This binder shall contain all of the items as listed on the Ohio EPA SWP3 Checklist. This binder shall contain a copy of the Ohio EPA Notice to Proceed letter; NASA's Duty to Inform Form (see Appendix C), completed contractor weekly and storm event site inspections (see Appendix D for example checklist), and any amendments to the plan documenting changes in BMPs utilized or utilization of the plan itself.

Upon completion of the project the Notice of Termination (NOT) Signoff Form (see Appendix E) shall be signed by all required parties once the site has reached 70 percent of full soil stabilization and all soil-disturbing activities are completed. At Lewis Field, the Ohio EPA NOT application is verified, completed, and signed by the SHED Division Chief and then submitted to the Ohio EPA to request the cease of coverage under the CGP. At Plum Brook Station, the Environmental Manager performs these duties. The original Ohio EPA NOT concurrence letter will be maintained by SHED.

6.4 Permits

6.4.1 Ohio EPA Facility Permit Number 3GQ00067*BG (Appendix F)

In compliance with the provisions of the Federal Water Pollution Control Act and the Ohio Water Pollution Control Act (Ohio Revised Code Chapter 6111), discharges of storm water from Lewis Field, as defined in Part 7 of the NPDES Permit number OHQ000002, is authorized by the EPA to discharge from outfalls and to the receiving waters of the state in accordance with the conditions specified in this permit.

6.4.2 Lewis Field NPDES Waste Water Treatment Works Discharge Permit Number 3IO00001*GD

This permit authorizes Lewis Field to discharge in accordance with the limitations and monitoring requirements stated in the permit for Outfalls 001, 003, 004, 006, 007, and 008. Parameters include mercury, oil and grease, pH, chlorine, conductivity, total dissolved solids, temperature, and flow. Contact the SHED Waste Water Program Manager for copies of this permit.

6.4.3 NPDES Waste Water Discharge Permit Number 2IO00002*JD

This permit authorizes Plum Brook Station to discharge in accordance with the limitations and monitoring requirements stated in the permit for Outfalls 001, 002, 003, 005, 010, 014, and 016 and sludge monitoring for the package waste treatment plant at Space Power Facility. Parameters include metals, oil and grease, pH, chlorine, chemical oxygen demand, hardness, total suspended solids, dissolved oxygen and nitrogen, carbonaceous biochemical oxygen demand, fecal coliform, benzene, toluene, ethylbenzene, and xylene (BTEX), temperature, and flow. Contact the PBS Environmental Programs Manager for a copy of this permit.

6.4.4 Ohio EPA Construction General Permit (CGP) Number OHC000003

For projects disturbing soils of 1 acre or larger, a SWP3 shall be developed prior to submitting the NOI application to the Ohio EPA. This [permit](#) states all of the requirements to be included in the SWP3 as well as the responsibilities of the permittee (NASA).

6.4.4.1 Ohio EPA CGP Co-Permittee Notice of Intent (NOI) Application

- Contractors and subcontractors impacted by the requirements of a project's SWP3 shall submit [an Ohio EPA Co-Permittee NOI application form](#) for their activities to be covered under the Construction General Permit granted to the project. No fee is required with this permit.
- Ensure the Facility Permit ID number listed on the Ohio EPA permission letter is on the Co-Permittee NOI application form to inform Ohio EPA personnel which project the application applies to.
- Ohio EPA will send an acceptance letter to the applicant.
- Contact the Storm Water Program Manager at 216-433-8764 for further assistance.

6.4.5 Individual Permits

Discharges required but not covered by any of the above referenced permits may require an individual permit to obtain authorization to discharge or continue operations. Such permits may include a Permit to Install, Industrial Storm Water, Small Sanitary Discharge, Non-Contact Cooling Water, and Temporary Discharges.

6.5 Storm Water Management Program (Lewis Field Only)

6.5.1 Ohio EPA Small, Nontraditional MS4 Permit Requirements

Per this permit, Lewis Field shall develop, implement, and enforce a SWMP designed to reduce the discharge of pollutants from the Center to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of Ohio Revised Code (ORC) 6111 and the CWA. The SWMP shall include management practices, control techniques, and system, design, and engineering methods and shall be modified to include provisions as Ohio EPA determines appropriate after its review of the program for the control of such pollutants. The SWMP shall include the following information for each of the six minimum control measures described in Part III.B of the MS4 permit.

6.5.1.1 Six Minimum Control Measures

The six minimum control measures include (1) Public Education and Outreach, (2) Public Involvement and Participation, (3) Illicit Discharge Detection and Elimination, (4) Construction Site Runoff Controls, (5) Postconstruction Best Management Practices, and (6) Good Housekeeping and Pollution Prevention. Each minimum control measure requires an assortment of BMPs and measurable goals to gauge their effectiveness in preventing storm water pollution and shall be documented over each 5-year permit term, with summary annual reports submitted to the Ohio EPA ending each year (submitted to the Ohio EPA by April 1 each year).

The following are brief summaries of what each minimum control measure requires and examples of what has been implemented in the first 5-year term and what is being considered for the second 5-year term.

6.5.1.1.1 Public Education and Outreach

Ohio EPA has designated Lewis Field as a nontraditional MS4; therefore Lewis Field is required only to provide educational material, and outreach to employees, onsite contractors, and individuals using the facilities. Posters, Today@Glenn postings, Aerospace Frontier postings, and Earth Day have been and will continue to be utilized.

6.5.1.1.2 Public Involvement and Participation

Ohio EPA has designated Lewis Field as a nontraditional MS4; therefore Lewis Field is required only to involve employees, onsite contractors, and individuals using the facilities. Online access to the SWMP and annual reports, opportunities to partake in awareness events such as storm drain labeling, and opportunities to participate in storm water surveys have been and will continue to be utilized.

6.5.1.1.3 Illicit Discharge Detection and Elimination

Lewis Field is required to develop, implement, and enforce a program to detect and eliminate illicit discharges, as defined in Part VI of the permit. This includes having a comprehensive storm sewer map, showing the location of all outfalls and the names of all surface waters of the state that receive discharges from those outfalls. This map is now required to show all catch basins, pipes, and postconstruction water quality devices that have been installed to meet Ohio EPA's NPDES construction general permit requirements.

The Center's SWMP shall enforce policies to prohibit illicit discharges such as illegal dumping, cross connections, and other non-storm-water discharges. Facility personnel shall be informed of the hazards associated with illegal discharges and improper disposal of wastes.

Lewis Field is also required to develop an IDDE program to actively investigate the source(s) of contamination identified during a dry weather screening process. If determined that an illicit discharge has occurred or is occurring, the required Lewis Field IDDE team further tracks the source of the contamination through the use of underground record drawings of the sewer systems, in-field sewer investigations, dye testing, or third-party camera inspections.

Upon the IDDE team locating the source, the tasks required to eliminate the source are initiated with CPARs issued to the responsible organization(s) in order to track the progress of eliminating the source and prevention measures to be put in place. SHED maintains the records of illicit discharges detected and eliminated through the CPAR system.

6.5.1.1.4 Construction Site Runoff Controls

- Requires Lewis Field to reduce pollutants from construction activities that result in a land disturbance of greater than or equal to 1 acre.
- Reduction of pollutants in storm water discharges from construction activity disturbing less than 1 acre shall be included in this program if that construction activity is part of a larger common plan of development that would disturb 1 acre or more.
- Policies shall be equivalent with the technical requirements set forth in the Ohio EPA NPDES Construction General Permit number OHC000003.
- For Lewis Field, storm water construction specifications have been written and are included in all construction bid packages to contractors detailing the requirements and procedures stated in the Ohio EPA Construction General Permit and the Ohio Department of Natural Resources (ODNR) [2006 Rainwater and Land Development Manual](#).

- All projects of 1 acre or larger have SWP3s developed and are approved by the FD Civil Systems Manager and SHED's Storm Water Program Manager prior to the Ohio EPA NOI being submitted for coverage under the Ohio EPA CGP.
- Oversight of the implementation and maintenance of construction site runoff controls are required by all of the following: contractors per the policies of this chapter, the SWP3 where applicable, Facilities Division inspectors and QATs; and the SHED Storm Water Program Manager.

6.5.1.1.5 Postconstruction Best Management Practices

- Requires Lewis Field to set policies and requirements to address storm water runoff from new development and redevelopment projects with the goal of returning to predevelopment runoff conditions.
- Policies shall be equivalent with the technical requirements set forth in the Ohio EPA NPDES Construction General Permit number OHC000003.
- Requires policies to ensure adequate long-term operation and maintenance of the BMPs implemented.
- Structural practices include swales, bioretention gardens, permeable paver parking lots, vegetated roofs, oil and water separators, and other manmade systems to capture storm water pollutants before they can migrate directly to Abram Creek and Rocky River.
- Nonstructural practices include the policies themselves, which may include protecting wetlands and riparian setbacks, maintaining and/or increasing open space, establishing no-mow zones, and other means of low-impact development to minimize soil disturbances and the increase of impervious areas such as asphalt and concrete parking lots.
- See ODNR [2006 Rainwater and Land Development Manual](#) for further guidance.

6.5.1.1.6 Good Housekeeping and Pollution Prevention

- Requires Lewis Field to develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.
- The training mechanism shall address such activities as fleet and building maintenance, new construction and land disturbances, storm water system maintenance, and grounds maintenance.
- Industrial facilities that conduct activities described in 40 CFR 122.26(b)(14) that are not required to obtain Industrial Storm Water General Permit coverage, including vehicle maintenance facilities, fuel transfer stations, exterior storage lots, a SWP3 shall be developed and implemented in accordance with the SWP3 requirements of Ohio EPA's Industrial Storm Water General Permit (OHR000004).
- Lewis Field's SPCC plan is one of these BMPs and stems from the amount of oil stored and used at the Center. SPCC annual training is available on SATERN or in-class sessions are available to meet areas of this requirement.
- Street sweeping, sewer cleaning, and oil and water separator inspecting and cleaning are other BMPs the Center implements to meet this minimum control measure.
- All personnel and organizations should assess their task duties and their potential for creating storm water pollution prevention. The main organizations and their responsibilities have been the main focus in this chapter, but the policies apply to all personnel at Lewis Field.

6.6 Storm Water Accumulations

At Lewis Field, the contractor shall obtain sampling and analysis as directed by either the Storm Water Program Manager (216-433-8764) or Waste Water Program Manager (216-433-5621) prior to discharge to surface water.

At Plum Brook Station, the contractor shall obtain sampling and analysis as directed by the Plum Brook environmental staff prior to discharge to surface water.

6.6.1 Water Accumulations in an Excavation

Storm water runoff that enters and accumulates in excavations shall be inspected by respective Center environmental staff prior to purging.

6.6.2 Accumulations in Exterior Aboveground Storage Tank (AST) Secondary Containments

Storm water and snow melt accumulations in secondary containments of exterior ASTs shall be inspected for oil or fuel sheen, odors, and discoloration by the respective Center's environmental staff prior to discharge. Inspections and discharges shall be documented. In instances where sheen is observed, the tank operator shall issue a NASA [C-260a](#) to Waste Management to have the contaminated water collected, analyzed, and disposed of properly. Source of the sheen shall be identified and fixed (if feasible) and the containment cleaned of any remaining residual fuels and/or oils prior to additional deliveries to the tank.

6.6.3 High-Voltage Tunnels and Telephone Manways

Storm water accumulations in high-voltage tunnels and telephone manways shall be visually inspected by the respective Center's environmental staff for the presence of fuel or oil sheen, pungent odors, or noticeable discolorations prior to discharge to the storm sewer system.

6.6.4 Building Subbasements and Utility Trenches

Ground water accumulations in building subbasements and utility trenches shall be visually inspected by the respective Center's environmental staff for the presence of fuel or oil sheen, pungent odors, or noticeable discolorations prior to discharge to the storm sewer system.

7.0 RECORDS

- Exterior AST Secondary Discharge Inspections
 - SHED AST Program Lead for ASTs at buildings 5, 12, 53, and 64
 - Waste Management Tank Site Manager for ASTs at building 215
 - Support service contractor at Plum Brook Station
- Inspections, discharge records, and applicable sample analysis for storm water runoff and ground water accumulations from excavations, high-voltage tunnels, telephone manways, subbasements, and building utility trenches
 - For Lewis Field, maintained by the SHED Storm Water Program Lead
 - For Plum Brook Station, maintained by the Environmental Manager
- Ohio EPA NOI, NOT, Co-Permittee acceptance letters
 - For Lewis Field, maintained by the SHED Storm Water Program Lead
 - For Plum Brook Station, maintained by the Environmental Manager
- Pesticide, herbicide, fertilizer applications, locations, and amounts
 - Maintained by the respective support service contractor at Lewis Field and Plum Brook Station
- SHED Construction SWP3 Review forms and Sign-Off Form (8.0appendix B)
 - For Lewis Field, maintained by the SHED Storm Water Program Lead
 - For Plum Brook Station, maintained by the Environmental Manager
- SHED Duty to Inform Sign-Off Form (8.0appendix C)
 - For Lewis Field, maintained by the SHED Storm Water Program Lead
 - For Plum Brook Station, maintained by the Environmental Manager
- SHED NOT Sign-Off Form (8.0appendix E)

- For Lewis Field, maintained by the SHED Storm Water Program Lead
- For Plum Brook Station, maintained by the Environmental Manager
- SHED monthly construction site inspection forms (8.0appendix G)
 - For Lewis Field, maintained by the SHED Storm Water Program Lead
 - For Plum Brook Station, maintained by the Environmental Manager
- SHED-submitted annual Lewis Field SWMP reports to the Ohio EPA
 - Maintained by the SHED Storm Water Program Lead
- Salt usage, salt spreader calibration, street sweeping usage, and waste disposal records
 - Maintained by the respective support service contractor at Lewis Field and Plum Brook Station

8.0 REFERENCES

Document number	Document name
2006 Edition	Rainwater and Land Development Manual
40 CFR 112	Oil Pollution Prevention
40 CFR 122	National Pollutant Discharge Elimination System (NPDES)/Storm Water Permit Regulations
42 United States Code (U.S.C.) 17094	Energy Independence and Security Act (EISA) of 2007
Ohio Regional Code 6111	Ohio Water Pollution Control Act
GLM-QS-1800.1A	Environmental Programs Manual, Chapter 3, Water Pollution Control
GLM-QS-1800.1A	Environmental Programs Manual, Chapter 8, Spill Response and Control
GLM-QS-1800.1A	Environmental Programs Manual, Chapter 21, Pest Control
GLM-QS-1800.1A	Environmental Programs Manual, Chapter 23, Handling and Disposal of Soil
Title II Pretreatment Regulations	Northeast Ohio Regional Sewer District Code of Regulations

APPENDIX A.—DEFINITIONS AND ACRONYMS

Aboveground storage tank (AST)

Best management practice (BMP).—A schedule of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of surface waters of the state. BMPs also include treatment requirements, operating procedures, and practices to control runoff, spillage and leaks, sludge or waste disposal, or drainage from raw material storage.

Benzene, toluene, ethylbenzene, and xylene (BTEX)

Clean Water Act (CWA).—Formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972.

Code of Federal Regulations (CFR)

Construction General Permit (CGP).—State-issued permit for controlling water pollution from construction sites of 1 acre and larger in scope.

Contractor Construction Manager (CCM)

Contractor Project Manager (CPM)

Control measure.—Any best management practice or other method used to prevent or reduce the discharge of pollutants to the waters of the state.

Corrective and Preventive Action Report (CPAR)

Duty to Inform.—The permittee (representative that obtains a Construction General Permit from Ohio EPA) shall inform all contractors and subcontractors not otherwise defined as “operators” in Part VII of Ohio EPA’s Construction General Permit (OHC000002 and/or OHC000003), who will be involved in the implementation of the Storm Water Pollution Prevention Plan (SWP3), of the terms and conditions of the general construction permit. Furthermore, the permittee shall maintain this document containing the signatures of all contractors and subcontractors involved in the implementation of the SWP3 as proof acknowledging that they reviewed and understand the conditions and responsibilities of the SWP3, including all (i) erosion controls, (ii) sediment controls, (iii) nonsediment pollutant controls, and (iv) postconstruction controls (Ohio EPA’s Construction General Permit). See Appendix E.

Energy Independence and Security Act (EISA)

Environmental Protection Agency (EPA)

Facilities Division (FD)

Glenn Research Center (GRC)

Health and Safety Plan (HASP)

Illicit connection.—Any manmade conveyance connecting an illicit discharge directly to a municipal separate storm sewer.

Illicit discharge.—As defined in 40 CFR 112.26(b)(2) and refers to any discharge to a municipal separate storm sewer that is not entirely composed of storm water, except discharges authorized under an NPDES permit (other than the NPDES permit for discharges from the MS4) and discharges resulting from fire fighting activities.

Illicit discharge detection and elimination (IDDE)

Impervious area or surface.—Area composed of any material that impedes or prevents natural infiltration of water into the soil.

Integrated Contingency Plan (ICP).—Plan intended to be used by facilities to prepare emergency response plans for responding to releases of oil and nonradiological hazardous substances. The Integrated Contingency Plan creates one functional emergency response plan by consolidating plans necessary to comply with multiple regulations.

Larger common plan.—A contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan.

Leadership in Energy and Environmental Design (LEED).—Developed by the [U.S. Green Building Council](#) (USGBC), provides a suite of standards for environmentally sustainable construction which awards points amongst many categories, but most specifically for storm water quantity and quality controls that are implemented in new construction and redevelopment.

Maximum extent practicable (MEP).—The technology-based discharge standard for Municipal Separate Storm Sewer Systems (MS4s) to reduce pollutants in storm water discharges that was established by the Clean Water Act 402(p). A discussion of MEP as it applies to MS4s is found at 40 CFR 122.34.

Municipal Separate Storm Sewer System (MS4).—A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) that are (1) Owned or operated by the Federal Government that discharge into surface waters of the state; (2) Designed or used for collecting or conveying solely storm water; (3) Which is not a combined sewer; and (4) Which is not a part of a publicly owned treatment works.

National Pollution Discharge Elimination System (NPDES).—Permit program developed to control water pollution by regulating point and nonpoint sources that discharge pollutants into waters of the United States.

Notice of Intent (NOI).—The Ohio EPA mechanism used to “register” for coverage under a general permit.

Notice of Termination (NOT).—The Ohio EPA mechanism used to “cease” coverage under the general permit.

Nontraditional MS4.—System similar to separate storm sewer systems in municipalities, such as systems at military bases, research facilities, and universities.

Northeast Ohio Regional Sewer District (NEORS)

Ohio Department of Natural Resources (ODNR)

Ohio Revised Code (ORC)

Oil.—Oil of any kind or in any form, including, but not limited to fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and, other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil.

Outfall from an MS4.—A point where a municipal separate storm sewer discharges to surface waters of the state and does not include open conveyances connecting two municipal separate storm sewers, or pipes, or tunnels or other conveyances that connect segments of the same stream or other surface waters of the state and are used to convey waters of the state.

Project Manager (PM)

Quality assurance/quality control (QA/QC)

Quality Assurance Technician (QAT)

Safety and Mission Assurance Directorate (SMAD)

Safety, Health and Environmental Division (SHED)

System for Administration, Training, and Educational Resources at NASA (SATERN)

Small MS4.—All municipal separate storm sewer systems that are located in an incorporated place with a population less than 100,000 as determined by the 1990 census by the United States Bureau of Census.

Spill prevention, control, and countermeasure (SPCC) plan.—Facilities subject to 40 CFR 112 must prepare and implement a plan to prevent any discharge of oil into or upon navigable waters of the United States. The SPCC plan is incorporated into the respective ICPs for both Lewis Field and Plum Brook Station.

Storm water.—As defined in 40 CFR 122.26(b)(13) and includes storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm Water Management Plan (SWMP).—Ohio EPA required plan for MS4 operators comprising six minimum control measures that when administered in concert, are expected to result in reduction of the discharge of pollutants into receiving water bodies.

Storm Water Pollution Prevention Plan (SWP3).—For construction sites, the CGP requires that a SWP3 be developed and must address all minimum components of the CGP and conform to the specifications of the Rainwater and Land Development manual. For Lewis Field only, a SWP3 that follows the guidelines of the Industrial Storm Water is required.

Support service contractor (SSC)

Surface waters of the state.—All streams, lakes, reservoirs, ponds, marshes, wetlands, or other waterways, which are situated wholly or partly within the boundaries of the state, except those private waters that do not combine or affect a junction with surface water.

Tank Site Manager (TSM)

Underground storage tank (UST)

United States Code (U.S.C.)

U.S. Green Building Council (USGBC)

APPENDIX B.—NASA CONSTRUCTION SWP3 CONCURRENCE FORM

NASA Glenn Research Center
Storm Water Management Program - Construction
Storm Water Pollution Prevention Plan (SWP3) Concurrence Form
Ohio EPA General Construction Permit # OHC000003

Location/Facility Name **Date Submitted to SHED**

NASA Project Manager Name **Phone #**

Prime Contractor (Responsible for SWP3 Implementation) **Phone #**

SHED Reviewer Name **Phone #**

I certify under penalty of law that all elements required of the storm water pollution prevention plan have been addressed in this plan per the Ohio EPA SWP3 Checklist. I understand that, by signing this SWP3 Concurrence Form, I am not authorized to disturb soils of this project until the Ohio EPA has reviewed the Notice of Intent Application and NASA has received the Ohio EPA letter to proceed.

Completion of this form constitutes an understanding that the NASA Facilities Division Project Manager and Prime Contractor hereby assumes site responsibilities formally managed by the NASA Facilities Division Civil Systems Manager.

SWP3 Completion Signatures:

Facilities Division Project Manager: Date:

Facilities Division SWP3 Reviewer: Date:

Prime Contractor Representative and Title Date:

Safety, Health, and Environmental Division SWP3 Reviewer Date:

APPENDIX C.—NASA GRC DUTY TO INFORM SIGNOFF FORM

**NASA Glenn Research Center
Duty to Inform Contractors and Subcontractors**

The NASA Glenn Research Center shall inform all contractors and subcontractors not otherwise defined as “operators” in Part VII of Ohio EPA’s Construction General Permit (OHC000002 and/or OHC000003), who will be involved in the implementation of the Storm Water Pollution Prevention Plan (SWP3), of the terms and conditions of the general construction permit. Furthermore, the permittee shall maintain this document containing the signatures of all contractors and subcontractors involved in the implementation of the SWP3 as proof acknowledging that they reviewed and understand the conditions and responsibilities of the SWP3, including all: (i) erosion controls; (ii) sediment controls; (iii) non-sediment pollutant controls; and (iv) post-construction controls (Ohio EPA’s Construction General Permit). In accordance with the National Pollutant Discharge Elimination System (NPDES) rules and Ohio EPA’s Construction General Permit, these signatures are required to be provided prior to commencement of work at the

NASA Glenn Research Center
(Permitted facility name)

The permittee has reviewed the conditions of the SWP3 with me and explained my responsibilities with regards to the above referenced construction activity in accordance with Ohio EPA’s Construction General Permit.

Contractor/Subcontractor	Company	Date
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

(use additional sheets for signatures as required)

**APPENDIX D.—EXAMPLE CONTRACTOR WEEKLY
 AND STORM EVENT SITE INSPECTION CHECKLIST**

Example Contractor Weekly and Storm Event Site Inspection Checklist

INSPECTIONS MUST BE CONDUCTED ONCE EVERY 7 DAYS AND WITHIN 24 HOURS OF A 0.5" OR GREATER RAINFALL. ALL SEDIMENT CONTROLS MUST BE INSTALLED PRIOR TO GRADING AND WITHIN 7 DAYS OF FIRST GRUBBING

TEMPORARY STABILIZATION

- | | Yes | No |
|---|--------------------------|--------------------------|
| 1. Are there any areas of the site that are disturbed, but will likely lie dormant for over 21 days? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Have all dormant, disturbed areas been temporarily stabilized in their entireties? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Have disturbed areas outside the silt fence been seeded or mulched? | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Have soil stockpiles that will sit for over 21 days been stabilized? | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Has seed and mulch been applied at the proper rate? In general, seed is applied at 3 to 5 lbs per 1000 sq ft and straw mulch is applied at 2-3 bales per 1000 sq ft. | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Has seed or mulch blown away? If so, repair. | <input type="checkbox"/> | <input type="checkbox"/> |
- Note areas where repairs or maintenance is needed or where this practice needs to be applied:
-

CONSTRUCTION ENTRANCES

- | | Yes | No |
|--|--------------------------|--------------------------|
| 1. Has the drive been constructed by placing geotextile fabric under the stone? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Is the stone 2-inch diameter? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Has the stone been placed to a depth of 6 inches, with a width of 10 feet and a length of at least 50 feet (30 feet for entrances onto individual sublots)? | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. If the drive is placed on a slope, has a diversion berm been constructed across the drive to divert runoff away from the street or water resource? | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. If drive is placed across a ditch, was a culvert pipe used to allow runoff to flow across the drive? | <input type="checkbox"/> | <input type="checkbox"/> |
- Note areas where repairs or maintenance is needed or where this practice needs to be applied:
-

SEDIMENT PONDS

- | | Yes | No |
|--|--------------------------|--------------------------|
| 1. Are concentrated flows of runoff directed to a sediment pond? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Is sheet-flow runoff from drainage areas that exceed the design capacity of silt fence (generally 0.25 acre or larger) directed to a sediment pond? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Is runoff being collected and directed to the sediment pond via the storm sewer system or via a network of diversion berms and channels? | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Is the sediment pond appropriately sized (67 cubic yards per acre of total drainage area)? | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Have the embankments of the sediment pond and the areas that lie downstream of the pond been stabilized? | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. For sediment basins that dewater 100% between storms, is the riser pipe wrapped with chicken wire and double wrapped with geotextile fabric? | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Does the riser have 1-inch diameter holes spaced 4 inches apart, both horizontally and vertically? | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. For sediment basins, which dewater 60% between storms, is the diameter of the dewatering hole per plan (see page 105 of <i>Rainwater</i> manual)? | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. For sediment traps, is there geotextile under the stone spillway and is the spillway saddle-shaped? | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. For sediment traps, which dewater 100% between storms, is the dewatering pipe end-capped, no larger than 6 inches in diameter, perforated and double-wrapped in geotextile? | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Is the length-to-width ratio between inlet(s) and outlet at least 2:1? NOTE: If not, a baffle should be added to lengthen the distance. | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Is the depth from the bottom of the basin to the top of the primary spillway no more than 3 to 5 feet? | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. For a modified storm water pond being used as a sediment pond, is the connection between the riser pipe and the permanent outlet water-tight? | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Was the basin installed prior to grading the site? | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Is it time to clean-out the sediment pond to restore its original capacity? Generally, sediment should be removed once the pond is half-full. Stabilize the dredged sediments with seed and mulch. | <input type="checkbox"/> | <input type="checkbox"/> |
- Note areas where repairs or maintenance is needed or where this practice needs to be applied:
-

This is not the complete checklist. Contact the SHED Storm Water Program Manager for a full copy.

APPENDIX E.—NASA GRC NOTICE OF TERMINATION CONCURRENCE FORM

NASA Glenn Research Center Storm Water Management Program Pre-Notice of Termination (NOT) Sign-off – DRAFT 02 Ohio EPA General Construction Permit # OHC000002	
Location/Facility Name	Facility Permit #
NASA Project Manager Name	Phone #
Prime Contractor (Responsible for SWP3 Implementation)	Phone #
SHED Inspector Name	Phone #

I certify under penalty of law that all elements of the storm water pollution prevention plan have been completed, the disturbed soil at the identified facility have been finally stabilized and temporary erosion and sediment control measures have been removed and/or that all storm water discharges associated with construction activity from the identified facility that are authorized by the above referenced NPDES general permit have otherwise been eliminated. I understand that, by signing this Pre-NOT Sign-off Form, I am no longer authorized to discharge storm water associated with construction activity by the general permit, and that discharging pollutants in storm water associated with construction activity to waters of the state is unlawful under ORC 6111 where the discharge is not authorized by a NPDES permit.

Completion of this form constitutes an understanding that the NASA Facilities Division Civil Systems Manager hereby assumes site responsibilities formally managed by the Project Manager and Prime Contractor.

Site Completion Signatures:

Facilities Division Project Manager:	Date:
Prime Contractor Representative and Title	Date:

Prime Contractor Representative and Title	Date:
Safety, Health, and Environmental Division Inspector	Date:

APPENDIX F.—LEWIS FIELD, OHIO EPA SMALL NONTRADITIONAL MS4 PERMIT


State of Ohio Environmental Protection Agency

STREET ADDRESS: MAILING ADDRESS:

Lazarus Government Center TELE: (614) 644-3020 FAX: (614) 644-3184
50 W. Town St., Suite 700 www.epa.state.oh.us P.O. Box 1049
Columbus, Ohio 43215 Columbus, OH 43216-1049

6/3/2009

NASA GLENN RESEARCH CENTER & LEWIS FIELD
MANUEL B DOMINGUEZ
21000 BROOKPARK RD
CLEVELAND OH 44135

RE: Approval for coverage under Ohio EPA NPDES General Permit **OHQ000002**
STORM WATER ASSOCIATED WITH **SMALL MS4 NOI** odnr number:
if applicable

Dear Applicant:
The Ohio Environmental Protection Agency has received a Notice of Intent for coverage under the above referenced general permit for :

NASA GLENN RESEARCH CENTER LEWIS FIELD County: CUYAHOGA
21000 BROOKPARK RD City: CLEVELAND

Ohio EPA Facility Permit Number: 3GQ00067*BG Estimated Disturbed Acreage

This site/facility is approved for coverage under the above referenced Ohio EPA general permit. Please use your Ohio EPA facility permit number in all future correspondences.

Please familiarize yourself with your general permit. The permit contains requirements and prohibitions with which you must comply. Coverage remains in effect until a renewal general permit is issued and Ohio EPA has contacted you in writing about submitting a new NOI for continuing coverage.

For Coal Surface Mining Permittees enclosed are Monthly Operating Report (MOR) forms for your use.

Program contacts:

Construction : Mike Joseph at (614) 752-0782 michael.joseph@epa.state.oh.us
MS4 / Marina / Alt.Const : Jason Fyffe at (614) 728-1793 jason.fyffe@epa.state.oh.us
MS4 / Industrial : Anthony Robinson at (614) 728-3392 anthony.robinson@epa.state.oh.us
Industrial / Coal: John Morrison at (614) 644-2259 john.morrison@epa.state.oh.us

You may obtain current information and forms from our web site at:
<http://www.epa.state.oh.us/dsw/storm> Thank you for your cooperation in this matter.

Sincerely,



Chris Korleski
Director

Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korleski, Director

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APPENDIX G.—SHED MONTHLY CONSTRUCTION SITE INSPECTION FORM

NASA Glenn Research Center	
SHED Monthly Construction Site Inspection Report	
Project Name and Location	
Project ID	Contractor(s)
NASA Project Manager	
NPDES Permit Emergency Items marked indicate creation of a Violation with the Ohio EPA NPDES Permit #3GQ00B7*BG, 40 CFR 122-124, and NASA GRC Policy and Plans.	<input type="checkbox"/> If required, SWP3 was not onsite and available for review during the site inspection <input type="checkbox"/> If required, contractor has inadequately maintained records of weekly and storm event inspections <input type="checkbox"/> Insufficient and/or lack of sediment/erosion controls to prevent sediment loss from leaving project site <input type="checkbox"/> Visible signs of concrete washout and/or concrete slurry being allowed to enter storm inlet <input type="checkbox"/> Inadequate construction entrances and/or prevention of construction debris from being tracked off site <input type="checkbox"/> Fuel tanks and drums of toxic materials are stored within 3 meters (10 feet) of a catch basin
Items marked below with an X are non-compliances with Ohio EPA NPDES Permit #3GQ0067*BG and if applicable to the Ohio EPA Construction General Permit for the project.	

<p>1. Construction Entrances</p> <ul style="list-style-type: none"> <input type="checkbox"/> Construction entrances are not installed to minimize off-site tracking of sediment onto roadways <input type="checkbox"/> Traffic leaving the site is dropping mud or leaving dirt trails <input type="checkbox"/> Geotextile fabric is not placed under the stone driveway <input type="checkbox"/> Roads are not swept immediately after sediment or mud has accumulated <input type="checkbox"/> Gravel drive is not maintained and replaced when sediment laden <input type="checkbox"/> Culvert pipe has not been installed to allow run-off to flow across the drive when the drive has been placed over a ditch <p>2. Storm Inlet Protection</p> <ul style="list-style-type: none"> <input type="checkbox"/> All inlets susceptible to sediment infiltration are not protected to prevent sediment from leaving site <input type="checkbox"/> Accumulated sediment around the inlet has not been removed on a timely basis <input type="checkbox"/> Water does not pond around the inlet when it rains <input type="checkbox"/> Curb Inlet protection does not cover the entire grate and curb window <input type="checkbox"/> Yard inlet protection does not encircle the entire grate <input type="checkbox"/> Inlet protection is not properly entrenched or anchored so water does not pass under it <input type="checkbox"/> Inlet protection fabric is not properly supported to prevent sagging <p>3. Non-Sediment Pollution Control and Truck Wash Out Area</p> <ul style="list-style-type: none"> <input type="checkbox"/> Waste and packaging are not disposed of in a dumpster <input type="checkbox"/> Sediment is not being swept back to the site instead of the storm inlets <input type="checkbox"/> Stockpiles of soil and gravel are not stored 3 meters from inlets <input type="checkbox"/> Proper dewatering methods are not used at excavation sites <input type="checkbox"/> Areas designated for washing out load out and concrete trucks are not being maintained <input type="checkbox"/> Washings are not contained on site within a bermed area until they harden and allowed to enter a ditch or storm inlet 	<p>4. Silt Fence Applications</p> <ul style="list-style-type: none"> <input type="checkbox"/> Silt fence is not installed with the holding posts on the clean side of the fence <input type="checkbox"/> Silt fence is not properly trenched at least 6" into the ground <input type="checkbox"/> Silt fence trench is not backfilled to prevent run-off from undercutting the fence <input type="checkbox"/> Fence is not pulled tight so it won't sag when water ponds behind it <input type="checkbox"/> Ends of the silt fence are not brought up slope to prevent run-off from going around the ends <input type="checkbox"/> Built-up sediment is not being removed when it has reached one-third the height of the fence <input type="checkbox"/> The silt fence is not controlling an appropriate amount of area <p>5. Temporary Soil Stabilization</p> <ul style="list-style-type: none"> <input type="checkbox"/> All disturbed areas that will be dormant for 21 days or longer have not been seeded, mulched, or strawed <input type="checkbox"/> Soil stockpiles that will be dormant for 21 days or longer have not been seeded, mulched, or covered with a tarp <input type="checkbox"/> Stabilization has not been started within 7 days of the date the area became inactive <input type="checkbox"/> For areas within 50 feet of a waterway, the stabilization was not started within 2 days of the date the area became inactive <input type="checkbox"/> If using straw mulch, it has not been spread over the entire disturbed area in a consistent and even layer <input type="checkbox"/> For slopes, straw is not properly secured with mulch netting, or straw matting has not been used <input type="checkbox"/> Bare spots, washouts, and/or areas of unhealthy growth are not being repaired or replaced <p>6. Permanent Soil Stabilization</p> <ul style="list-style-type: none"> <input type="checkbox"/> Proper soil preparation has not been completed prior to final seeding <input type="checkbox"/> Final seeding and mulching has not been applied at the appropriate rate to achieve 70% soil stabilization <input type="checkbox"/> Bare spots, washouts, and/or areas of unhealthy growth are not being repaired or replaced <input type="checkbox"/> When rainwater has been inadequate, the seeded areas have not been manually watered until vegetation is established
---	--

Remarks (Please see reverse side for follow-up information)		
Inspector Name and Title	Date of Inspection	Time of Inspection
Remarks		