

# **POLLUTION PREVENTION PROGRAM PLAN**

**National Aeronautics and Space Administration**

**Goddard Space Flight Center**

**Wallops Flight Facility**

**Wallops Island, Virginia**



March 2023

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# **POLLUTION PREVENTION PROGRAM PLAN**

**National Aeronautics and Space Administration  
Goddard Space Flight Center  
Wallops Flight Facility  
Wallops Island, Virginia**

**Reviewed By:**

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Deputy Division Chief,  
Medical and Environmental Management Division**

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**POLLUTION PREVENTION PROGRAM PLAN REVIEW**

<b>Annual Review Date</b>	<b>Comments</b>	<b>Initials</b>
6/5/2015	2014 updates include changing Executive Order number to 13693, and updating Tables A.1, A.2, and A.3.	MFS
12/16/2016	2015 updates include Tables 4.1, 5.1, A.1, and A.2. Graphs were added to Section 4.0	MFS
3/31/2017	2016 updates include Tables 4.1 and A.2	MFS
4/24/2018	2017 updates include Environmental Policy, website location, Tables 4.1, 5.1, A.1 and A.2	MFS
5/13/2019	2018 updates include Environmental Policy, website location, Tables 4.1, 5.1, A.1 and A.2	MFS
6/11/2020	2019 updates include GPD and NPR version, website location, Tables 4.1, 5.1, A.1 and A.2	MFS
01/13/2023	2022 updates include updates to Tables 12.1 and 13.1. Graphs updated yearly.	MFS/MLM

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## 1 Purpose

The purpose of the Pollution Prevention Program (P3) Plan is to provide a formal procedure for conducting Pollution Prevention (P2), waste minimization, and green procurement activities at Goddard Space Flight Center's (GSFC's) Wallops Flight Facility (WFF), including roles and responsibilities, evaluation of P3 opportunities, implementation of P3 projects, and development of metrics to evaluate those projects. This plan will be reviewed annually.

## 2 Applicability

This plan is applicable to all GSFC WFF personnel, facilities, and activities, including all permanent and temporary activities at Wallops Island, Virginia only. It also applies to all WFF tenant's organizations, contractors, grantees, clubs, and other entities operating under the auspices of GSFC's WFF or on GSFC's WFF property as required by law and as directed by contractual, grant, and agreement documents. Drinking Water Sampling Plan

## 3 Authority

Authority for this P3 plan comes from:

- NASA Policy Directive (NPD) 8500.1C NASA Environmental Management
- NASA Procedural Requirements (NPR) 8530.1B Affirmative Procurement Program and Plan for Environmentally Preferable Products
- Goddard Policy Directive (GPD) 8500.1D, Environmental Policy and Program Management
- Annual NASA Strategic Sustainability Performance Plan

## 4 References

References for this document include:

- Emergency Planning and Community-Right-to Know Act of 1986 (EPCRA) Public Law 99-499: Superfund Amendments and Reauthorization Act (SARA), Title III, Section 312 and 313
- Clean Air Act (CAA), Public Law 101-549, amended November 15, 1990
- Pollution Prevention Act of 1990 (42 U.S.C. 13101 et seq.)
- Resource Conservation and Recovery Act (RCRA) of 1977, as amended by the Hazardous and Solid Waste Amendments of 1984 (42 U.S.C. 6002)
- 40 CFR 372 –Toxic Chemical Release Reporting Community Right-to-Know
- 2002 and 2008 Farm Security and Rural Investment Act, Section 9002
- GPR 8500.3 Waste Management
- GPR 8500.4 Air Quality Management
- GSFC 23-54 Hazardous Waste Disposal Inventory



## 5 Cancellations

Pollution Prevention Plan for Wallops Flight Facility, dated June 2019, is superseded by this document.

## 6 Safety

Assessment Team members will be advised of relevant safety procedures by process owners in each work area prior to the start of the assessment.

## 7 Metrics

Monitoring metrics are specific to the project but may include any or all of the following:

- changes in volume of waste generation
- changes in volume of raw materials purchased
- changes in toxicity of waste streams
- quantity of material recycled
- revenue from recycling
- dollars saved
- estimated GHG emissions reduced

## 8 Definitions

- Affirmative Procurement** - Environmental stewardship through the utilization of the Federal Government's purchasing power to create markets, spur competition, create business and employment opportunities, enhance local and regional economies, reduce depletion of natural resources, and reduce the amount of material ending up in landfills through the preferential procurement of environmentally preferable goods and services. This program for acquiring Environmental Protection Agency (EPA)-designated products is required by the Resource Conservation and Recovery Act of 1976 (RCRA) (42 U.S.C. 6962) .
- BioPreferred Product** - As defined by Farm Security and Rural Investment Act of 2002 (FSRIA), a product determined by the Secretary of Agriculture to be a commercial or industrial product (other than food or feed) that is composed, in whole or in significant part, of biological products or renewable domestic agricultural materials (including plant, animal, and marine mammals) or forestry materials. Biobased industrial products are produced from renewable plant and animal sources, and are generally presumed to be more environmentally benign than their petroleum counterparts.
- Comprehensive Procurement Guidelines (CPG)** - The list of Environmental Protection Agency (EPA) designated items that must contain recycled content when purchased by federal, state, and local agencies, or by government contractors using appropriated federal funds. EPA is required to update the CPG every 2 years.
- Environmentally Preferable** - Products or services that have a lesser or reduced adverse

effect on human health and the environment when compared with competing products or services that serve the same purpose. This comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal of the product or service.

- e. **Greenhouse Gas** - A greenhouse gas is a gas that absorbs and emits radiant energy within the thermal infrared range. Greenhouse gases cause the greenhouse effect on planets. The primary greenhouse gases in Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.
- f. **Life Cycle Cost Analysis** - A comparison of the amortized annual costs of using a product with respect to a product that is not CPG-compliant. Costs under consideration include capital costs, installation costs, operating costs, maintenance costs, and disposal costs discounted over the lifetime of the product.
- g. **Ozone Depleting Substances (ODS)** - Any substances containing chlorofluorocarbons (CFC) and/or having characteristics of depleting tri-atomic oxygen.
- h. **Persistent, Bioaccumulative, and Toxic (PBT) Chemicals** - Highly toxic, long-lasting substances that can build up in the food chain to levels that are harmful to human and ecosystem health. They are associated with a range of adverse human health effects, including neurological, reproductive, and developmental problems; cancer; and genetic impacts.
- i. **Pollution** - Any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment, including fugitive emissions.
- j. **Pollution Prevention (P2)** - Source reduction as defined in the Pollution Prevention Act and other practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, or other resources; or protection of natural resources by conservation.
- k. **Pollution Prevention Program (P3)** - At WFF, the Pollution Prevention Program includes pollution prevention (P2), waste minimization, and green procurement.
- l. **Recovered Material** - Waste materials and byproducts which have been recovered or diverted from solid waste, but such term does not include those materials and byproducts generated from, and commonly reused within, an original manufacturing process.
- m. **Recycling** - The series of activities, including collection, separation, and processing, by which products or other materials are recovered from the solid waste stream for use in the form of raw materials in the manufacture of new products, other than fuel for producing heat or power by combustion.
- n. **Release** - Any planned or unplanned release 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 on-site landfills. Examples include shipments of hazardous wastes to Treatment, Storage, and Disposal Facilities (TSDF).
- o. **Request Originator** - The individual generating the procurement specification.
- p. **Recovered Materials Advisory Notices (RMANs)** - Notices through which, EPA provides purchasing guidance and recommends recovered and post-consumer material content levels for designated items. RMAN recommendations are guidance only.

- q. **Source Reduction** - Any practice that either reduces the amount of hazardous substance, pollutant, or contaminant entering any waste stream or released into the environment before recycling, treatment, or disposal or reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.
- r. **Toxic Release Inventory (TRI) Chemical** - A chemical or chemical category listed in 40 CFR 372.65. Through EPCRA, Congress mandated that a TRI be made public. The TRI provides citizens with accurate information about potentially hazardous chemicals and their use so that communities have more power to hold companies accountable and make informed decisions about how toxic chemicals are to be managed.
- s. **Waste Minimization** - A program required by Resource Conservation and Recovery Act involving source reduction and/or environmentally sound recycling of hazardous waste.

## 9 Commitment

In its Policy Directive GPD 8500.1E, *Environmental Policy and Program Management*, Goddard Space Flight Center states:

“The Goddard Space Flight Center (GSFC) missions expand knowledge of the Earth and its environment, the solar system, and the universe. To maintain our nation's leadership in this endeavor, GSFC commits to conducting missions in a manner that complies with environmental requirements and promotes environmental stewardship. As an integral part of all mission planning and implementation, it is GSFC’s environmental policy to:

- a. Comply with all applicable requirements of Federal statutes, regulations, and Executive Orders (EO); state, local, or territorial environmental laws and regulations; NASA’s policy and requirements; and agreements with other agencies, industry, and organizations;
- b. Incorporate environmental risk reduction and sustainable practices to the extent practicable throughout programs, projects, and activities, including planning, development, implementation, and operational phases;
- c. Consider environmental factors and impacts throughout the life cycle of programs, projects, and activities, including planning, development, execution, and disposition activities;
- d. Pursue environmental initiatives and objectives designed to protect, restore, and enhance mission resources;
- e. Prevent pollution, reduce waste generation, and manage cultural and natural resources in the most effective manner possible;
- f. Ensure that environmental liabilities and compliance are addressed appropriately within Space Act Agreements and tenant, customer, or similar arrangements;
- g. Implement pragmatic and cost-effective solutions to environmental challenges;
- h. Develop collaborative partnerships with Federal, state, local regulatory agencies, international entities, and governmental/nongovernmental and commercial organizations to leverage available and shared resources; improve materials and processes; identify, help develop, and comply with environmental requirements; prevent pollution; reduce waste generation; and manage cultural and natural resources in the most effective manner possible.

- i. Ensure that hazardous waste generated solely by onsite non-NASA organizations/agencies (e.g., tenants, customers) is manifested and disposed of using the non-NASA organization's/agency's Environmental Protection Agency identification number (EPA ID), as required by 42 U.S.C. 82. Although these organizations/agencies may independently use the same companies under contract to NASA for disposal of hazardous wastes, NASA EPA ID numbers will not be used for disposing non-NASA hazardous wastes, unless waived by the appropriate authority.
- j. Maintain an environmental management system (EMS), as implemented by NPR 8553.1, at all appropriate organizational levels. The EMS will address compliance obligations, risks, and opportunities; establish priority environmental aspects and impacts associated with GSFC's activities, products, and services; provide a framework for setting and reviewing environmental objectives and targets; and establish processes for communicating environmental information to persons working for or on behalf of NASA and the public. The EMS will be used to address all environmental risks and opportunities of internal GSFC operations and activities.
- k. Continue to improve our environmental performance by:
  - (1) Promoting awareness through education and training;
  - (2) Integrating environmentally sustainable best management practices into our daily work activities; and
  - (3) Exploring advances in environmental technology.

To accomplish these objectives, WFF will implement projects for reducing or eliminating generation of waste through source reduction and other pollution prevention methodologies. These projects will extend to air emissions, wastewater effluents, solid wastes, and hazardous wastes.

Priority is given to source and/or toxicity reduction. Where this is infeasible, recycling will be explored. Where recycling is not an alternative, treatment to reduce waste volume and/or toxicity shall be implemented. Finally, waste will be managed in a manner to minimize present and future effects on human health and the environment. WFF is committed to reducing the quantity and toxicity of generated wastes.

Pollution prevention is the responsibility of *all* of WFF employees. WFF is committed to identifying and implementing P3 opportunities through solicitation, encouragement, and involvement of all employees.

## **10 Program Implementation**

Pollution prevention activities at WFF will be managed in accordance with this plan. This plan and the policies and procedures established to implement the plan are developed by the Wallops Environmental Office and approved by the Deputy Division Chief, Medical and Environmental Division. The Plan is implemented by the Pollution Prevention Program Manager with the assistance of other Wallops employees who may originate, develop, evaluate, and implement specific pollution prevention projects.

Employees will be trained on the elements of P3 through the Environmental Management System training and at RCRA Annual Generator Training. The plan will also be available on the website at: <https://code200-external.gsfc.nasa.gov/250-WFF/node/40>.

## **11 Roles and Responsibilities**

### **11.1 Deputy Division Chief, Medical and Environmental Management Division**

The Deputy Division Chief is responsible for environmental issues at WFF. As such he/she will approve overall P3 policies and procedures. The Deputy Division Chief signature will be evidence of plan approval.

### **11.2 Pollution Prevention Program Manager**

The program manager has overall responsibility for the development and implementation of the P3 plan. The program manager has the responsibility for organizing, implementing, managing, or monitoring the following conducting P2, waste minimization, and green procurement activities methods and programs.

- integrating pollution prevention into the installation's comprehensive planning;
- preparing and updating baselines for hazardous material use and waste generation;
- coordinating the performance of opportunity assessments to identify and evaluate P3 procedural changes, projects, and equipment;
- recommending P3 projects and equipment;
- recommending policies for identifying, procuring, and tracking hazardous materials; and
- developing the installation's P3 training programs.

### **11.3 Assessment Team**

An assessment team will be formed as needed to perform P3 opportunity assessments. The primary responsibilities of the assessment team are to:

- perform opportunity assessments;
- aid in the implementation of projects identified by the opportunity assessment, if recommended by the program manager and approved by management of the process owner's organization, and
- monitor the performance of P3 projects.

The assessment team may be led by the P3 manager or by a team leader who has a vested interest in the particular waste streams or operations to be investigated. The results of all pollution prevention projects will be reported to the Environmental Office.

### **11.4 Employees**

Pollution prevention is the responsibility of all WFF employees.

## 12 WFF Pollution Prevention Program Goals

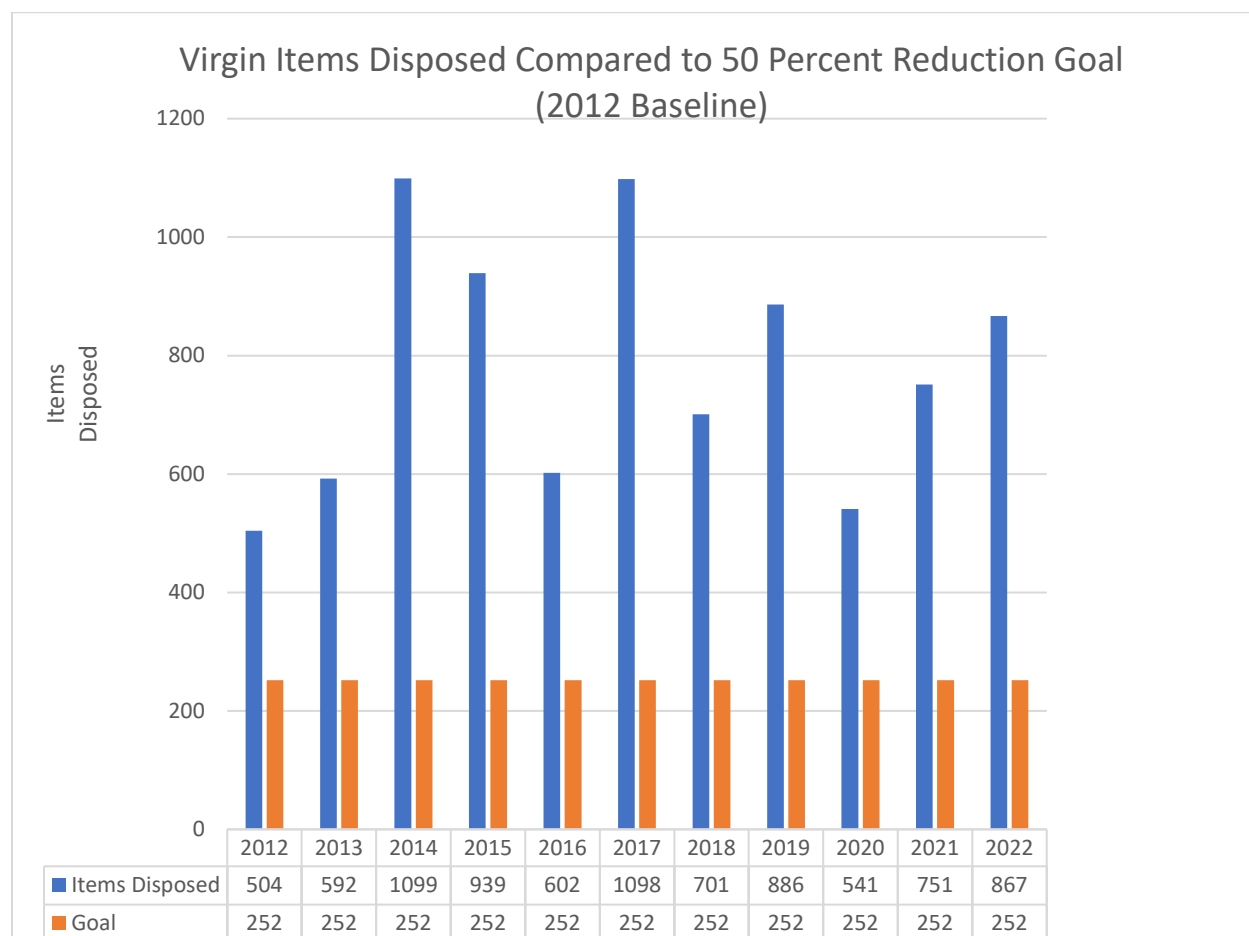
The long-term goals of WFF are to minimize the use of hazardous materials, minimize the generation of wastes, and minimize emissions of pollutants to the environment. Table 12.1 lists WFF Pollution Prevention Goals and progress towards reaching those goals. Progress on continuing goals are also displayed after Table 12.1 in a series of graphs.

**Table 12.1 WFF Pollution Prevention Goals**

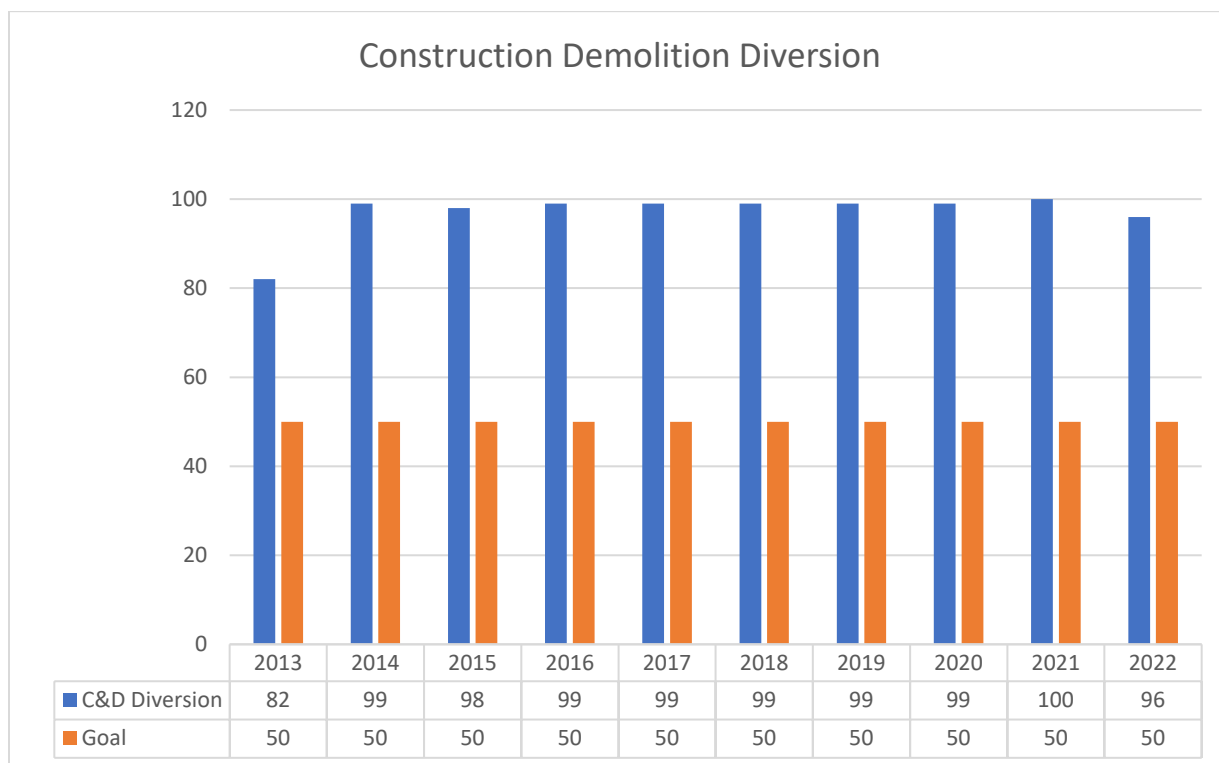
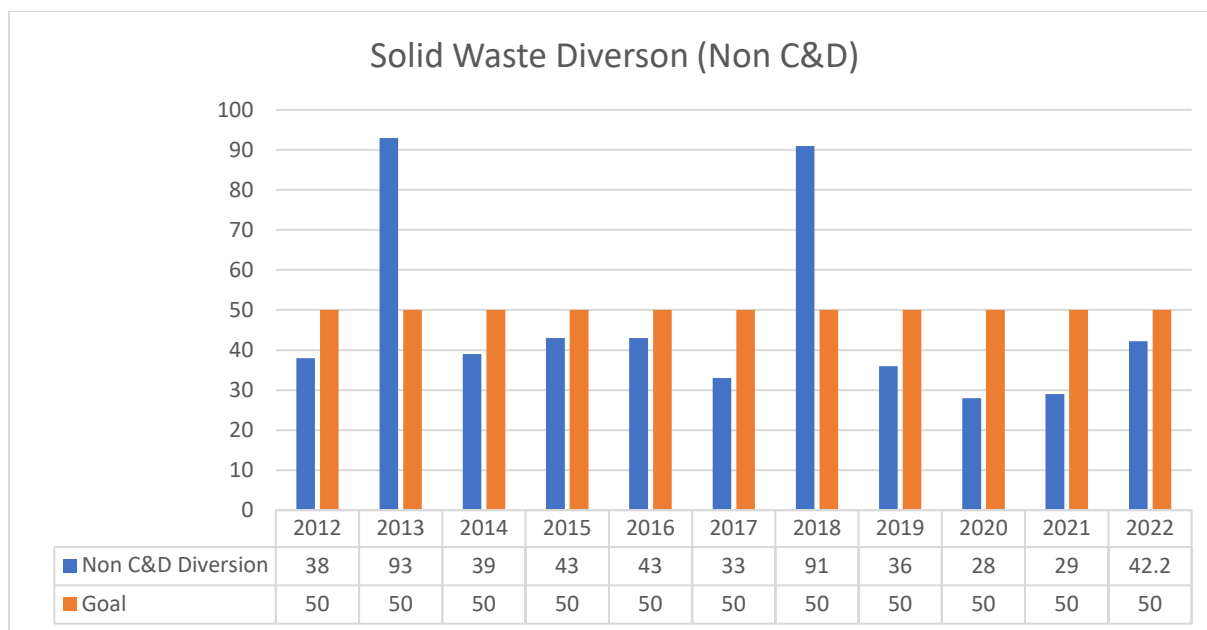
Waste Type	Goal (%)	Baseline Year	Target Year December 31	Goal Progress	Comments
Reduce Quantity of Virgin Chemicals Disposed	50%	2012	2023	Reduced from 1353 items (2008) to 504 items (2012 63%) and 592 items (2013 17 % increase) up to 1099 items in 2014, 939 items in 2015, 602 items in 2016, 1098 items in 2017, 701 items in 2018, 886 items in 2019, 541 items in 2020, 761 items in 2021, and 867 items in 2022.	New goal set in 2013 extending to 2015, in 2016 extending it to 2018, and in 2019 extending goal to 2023.
Achieve Nonhazardous Solid Waste Diversion Rate (recycling, donation, reuse, repair)	50%	N/A	2023	NETS data lists WFF diversion rate at 38% (2012), 93% (2013), 39% (2014), 43% (2015), 43% (2016), 33% (2017), 91% (2018), 36.2% (2019), 28% (2020), 29% (2021), and 42% (2022).	NETS data includes all material recycled even items not part of the solid waste stream such as used oil.
Achieve Construction and Demolition Materials Solid Waste Diversion Rate	50%	N/A	2023	NETS data lists WFF diversion rate at 82% (2013), 99% (2014), 98% (2015), 99% (2016, 2017, 2018, 2019, 2020), 100% (2021), and 96% (2022).	Working with Code 228 to improve data collection.

## 2022 WFF Pollution Prevention Plan

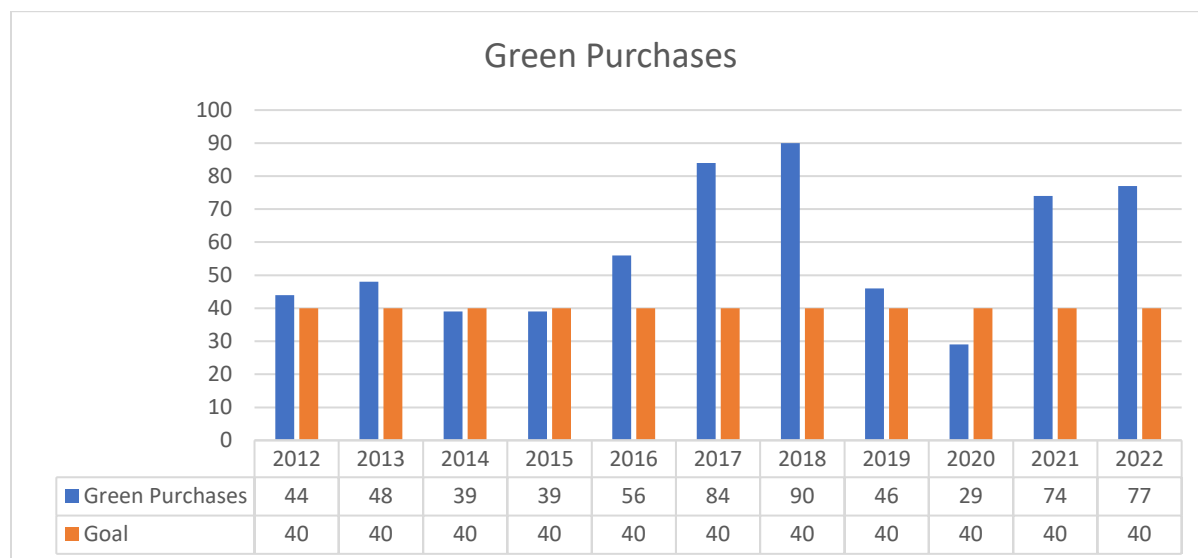
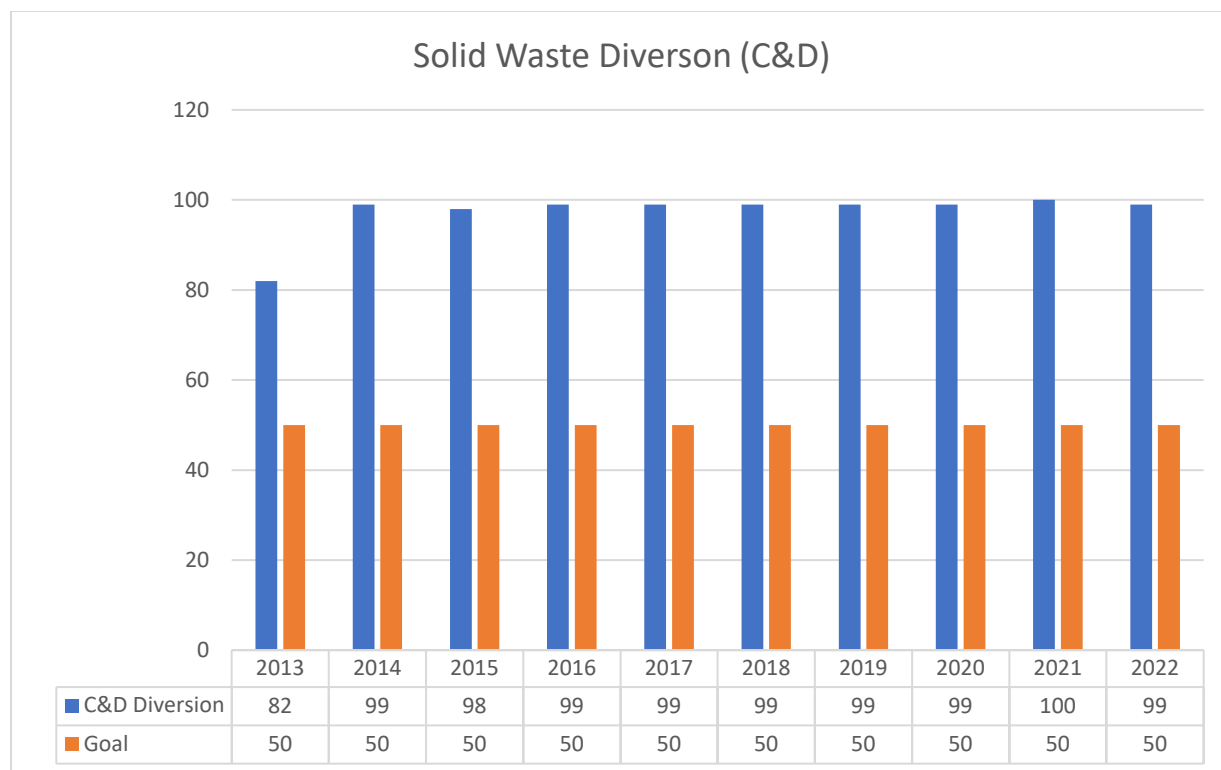
Waste Type	Goal (%)	Baseline Year	Target Year December 31	Goal Progress	Comments
Increase Purchase of Green Products and Services	40%	2012	2023	NETS data (Green Purchases by Site) 44% (2012), 48% (2013), 39% (2014) 39% (2015) 56% (2016), 84% (2017), 90% (2018), 46% (2019), 29% (2020), 74% (2021), and 77% (2022).	New goal set in 2013, in 2016 extending goal to 2018, and in 2019 extending goal to 2023.



## 2022 WFF Pollution Prevention Plan







## 13 Baseline Data

A baseline data is necessary to assess and thereby target specific waste streams, hazardous materials, and activities for P3. Data can be compiled from annual Tier II, Toxic Release Inventory (TRI), ODS, Biennial Hazardous Waste reports, NASA Environmental Tracking System (NETS) reporting calls, chemical inventories, and from the pertinent year's Hazardous Waste Disposal Inventory forms.

### 13.1 Toxic and Hazardous Chemicals

The following waste streams shown in Table 13.1 below will be reviewed annually for project opportunities to reduce the quantity of toxic and hazardous chemicals.

**Table 13.1 WFF Waste Streams**

Bldg.	POC	NASA SUPER	Type of area					Codes	Description
			HW	Oil/Oily rags	Universal	Project	Parts Washer		
A1 301	Brian Scharle 1254	830 Michael Cropper			•			UW	Batteries (1x5G)
A41 100	Dan Rothwell 1207	840 Jeff Reddish	•					D008	Solder (1 can)
A41 101	Dan Rothwell 1207	840 Jeff Reddish						D001	Aerosol cans (1x5G),
A41A	Dan Rothwell 1207	840 Jeff Reddish		•		•		Non	Hydraulic oil from antenna changes(project), oily rags (1x5G)
B29 Cage	Rodney Godwin 1259	227 Chuck Hook	•					D001	Aerosols from locating (1x30G)
B31 102 GM	Phil Belote 1485	227 Chuck Hook		•				Non	Used oil from mowers (1x55G), Oily rags (1x55G)
B31 101	Chuck Amrhein 1430	391 Carolyn Turner		•					Oily rags (1x5G)
B129 101	Timothy McCready 1508	240 Edward Northam	•	•	•			D001F002 F003, D001, UW, Non	Solvent rags (3x5G), Aerosols (1x5G), Batteries (1x5G), Oily water 1x5G)
C15 101	Gabby Layman Brian Chapin 2267	240 Edward Northam						Non	Lead battery (1x5G)
D1 Hangar 3 SAA H100	Blake Tomlinson 7028 Tristan Binder 1688	840 Jeff Reddish	•	•				D001, Non, D001, D001	Jet A (1x5G), Used Oil(1x55G), Solvent rags (3x55G), Aerosols (1x20G))
D50 108	Bobby Wilt 1083	227 Chuck Hook	•	•				D001 F001 F003 F005, Non	Solvent rags with methylene chloride, TCE, toluene, xylene, (1x5G) Used oil from maintenance at FOTW (1x55G)
E2 N110	Kyle Hoppes 1758 Jack Hammond 1205	840 Jeff Reddish			•			UW	Batteries (1x5G)
E2 C150	Kyle Hoppes 1758 Jack Hammond 1205	840 Jeff Reddish	•					D001 F001 F003 F005	Solvent rags (1x5G), 1X5G Used Oil

## 2022 WFF Pollution Prevention Plan

Bldg.	POC	NASA SUPER	Type of area					Codes	Description
			HW	Oil/Oily rags	Universal	Project	Parts Washer		
E2 N125A	Kyle Hoppes 1758 Jack Hammond 1205	840 Jeff Reddish	•					D008, D001	Solder, (1 can) Alcohol rags (1x5G)
E2 N117	Kyle Hoppes 1758 Jack Hammond 1205	840 Jeff Reddish	•					D008, D001	Solder (1 can), Alcohol rags (1x5G)
E105 106	Sarah Ross 1804	810 Giovanni Rosanova			•			UW	BATTERIES (1X5G)
E106 101	Steve Annis 1542	840 Jeff Reddish			•			UW	Batteries (1x5G)
E107 206	Linda Wiles 1173	392 Cindi Pietroski			•			UW	Batteries (1x5G)
E109 170	Tom Gadson 1080	598 Brenda Dingwall	•		•			D008, D001, UW	Solder (3 cans), Aerosols (1x5G), Batteries (1x5G)
E109 149	Joe Schreck 1359	548 Gabe Garde				•		NON REG	3D Printer Wash (2X5G)
E109 144	Josh Yacobucci 1940	548 Gabe Garde			•			UW	Batteries (1X5G)
E109 152	Josh Yacobucci 1940	548 Gabe Garde	•		•			D001, F002, F003, F005, D008	Acetone/epoxy rags (1x5G)
E109 272	Gerald Freeman 1294	569 Lisette Martinez	•		•			D001 D008, UW	Alcohol wipes solder rags (1x5G), Batteries (1x5G), Solder (1 can)
E109 273	Gerald Freeman 1294	569 Lisette Martinez	•		•			D001 D008, UW, D008	Alcohol wipes solder rags (1x5G), Batteries (1x5G), Solder (4 cans)
E109 276	Steve Bundick 1424	569 Lisette Martinez	•					D001, D008,	Alcohol wipes (1x5G), Solder (2 cans)
F6 204	Shirley Lapole 1204	800 Bob Jameson						Non	Alkaline batteries
F7 102	Roland Wescott 1624	850 Dave Wilcox	•					D001	1x5G alcohol wipes
F7 103	Roland Wescott 1624	850 Dave Wilcox	•					D001, F003	1x5G alcohol wipes
F7 106	Roland Wescott 1624	850 Dave Wilcox	•					D001, F003	1x5G acetone/IPA
F7 107	Roland Wescott 1624	850 Dave Wilcox	•					D001, F003	1x5G alcohol/acetone wipes
F7 140	Steve Lang 1490	820 Debra Fairbrother	•					D001 F001 F003	Methylene Chloride, Acetone and MIBK rags (2x5G)

## 2022 WFF Pollution Prevention Plan

Bldg.	POC	NASA SUPER	Type of area					Codes	Description
			HW	Oil/Oily rags	Universal	Project	Parts Washer		
F10 N111	Melissa Smith 1842	810 Giovanni Rosanova	•					D001 F003 D008, D008	Acetone solder rags (1x5G), Solder (3 cans)
F10 machine shop 11SAA C163	Denis Holmer 1523 Thomas McCready 2462 Safety- Dakota Rowland 1846	810 Giovanni Rosanova	•	•			•	D001 F003, Non, Non	Acetone alcohol rags (10 x5G), Nonhaz cutting fluid (1x55G), Used oil (1x55G)
F10 machine shop	Denis Holmer 1523 Thomas McCready 2462	810 Giovanni Rosanova	•					D006	Blast grit from machine shop for rocket assembly (1x55G)
F10 machine shop (outside stockroom)	Thomas McCready 2462	810 Giovanni Rosanova	•		•			UW, D001	Nicad batteries (1x5G, Aerosols (1x5G)
F10 S130	Thomas McCready 2462	810 Giovanni Rosanova e	•					D001F003F005 D035	Acetone rags alcohol rags (1 x5G)
F10 S264 mezzanine	Melissa Smith 1842	810 Giovanni Rosanova	•					D008, D001F003	Solder (5 cans), Alcohol,acetone solder rags (1x5G)
F10 S144	Kalib Ehrisman 2885	810 Giovanni Rosanova	•					D001 F003	Acetone oily rags (1x5G)
F10B X	Kalib Ehrisman 2885	810 Giovanni Rosanova	•					D001 F003F005, D001 F003F005	Petroleum naptha, toluene, n-Butyl alcohol from cleaning paint gun (1x30G), rags associated with above (1x20G)
F29 Shed	Denis Holmer 1523 Timothy Mccready 2462	810 Giovanni Rosanova		•				Non	Oily rags (1x5G)
F10 W100	John Doughty 1866	810 Giovanni Rosanova	•					D008, D001 F003	Solder (2 cans) Alcohol acetone rags (1x5G),
F10 N101	John Doughty 1866	810 Giovanni Rosanova	•					D008, D001 F003	Solder (1 can), Alcohol acetone rags (1x5G)
F10 N103	John Doughty 1866	810 Giovanni Rosanova	•					D008, D001 F003 D008	Solder (1 can), Solder alcohol, acetone rags (1x5G)
F10 N103A	Andrew Mueseler 1830	810 Giovanni Rosanova	•					D008	Solder (1 can)
F10 N130 and N130A ACS 2SAA	Tim Wilson 1100 Terri Snyder 2181	810 Giovanni Rosanova	•					D008, D001 F003 D008,D001, Non	Solder (2 cans), Alcohol acetone lead rags (1x5G) , Isopropanol (1x5G), Branson (1x5G)

## 2022 WFF Pollution Prevention Plan

Bldg.	POC	NASA SUPER	Type of area					Codes	Description
			HW	Oil/Oily rags	Universal	Project	Parts Washer		
F10 N125 Env/T&E 4SAA	Rob Marshall 1431	810 Giovanni Rosanova	•					D001 F003	Alcohol acetone rags (4x5G)
F10 N126	Rob Marshall 1431	810 Giovanni Rosanova			•			UW	Batteries (1x5G)
F10 N119	Rob Marshall 1431	810 Giovanni Rosanova	•	•				Non, D001 F003, D001D008	Used oil (2x5G), Alcohol acetone rags (2x5G), Aerosols(1x5G), Solder(1 can)
F10 N203	Scott Blake 1042	810 Giovanni Rosanova	•					D008	Solder (1 can)
F10 N230, N234, N235, N236 5 SAA	Terri Snyder 2181	810 Giovanni Rosanova	•					D001 D008 F003, D008	Alcohol solder rags(1x5G N230), Solder (1 can each room)
F10 W302	Tim Sherman 1187	810 Giovanni Rosanova	•		•			D001 F003, UW, D008, D001	Alcohol acetone, wipes from circuit board for rockets, (2x5G) Nicad batteries(1x5G), Solder (14 cans), Aerosols(1x5G)
F10 W301	Tim Sherman 1187	810 Giovanni Rosanova	•					D001 D008 F003, D008	Solder paste and wipes alcohol, acetone (2x5G), Solder (6 cans)
F10 W301A	Tim Sherman 1187	810 Giovanni Rosanova	•					D001 D008	Solder paste and wipes alcohol, acetone (1x5G)
F10 W301B	Tim Sherman 1187	810 Giovanni Rosanova	•					D001 D008	Alcohol rags (1x 5G), Solder (2 cans)
F16 128 Garage 3SAA	Gene Merritt 1939	227 Chuck Hook	•	•			•	Non, D001D018, Non, D001 F003 F002F005, D008, D001, UW, D008, D006	Used oil (1x55G), oil filters 1x55g, Fuel filters(1x5G), Nonhaz PW, Solvent rags (tetrachloroethane, Bladeen) (1x55G), Lead tire weights (1x5G), Aerosols (1x5G), Batteries (1x5G), Solder (1 can)
F16 106 Electric Shop	Phil Crofton 1446	227 Chuck Hook			•			UW	Lamps (1x4', 1x8') U tubes (1x4') CFL (1x5G), Batteries (1x5G)
F16 105 ECS Shop	Phil Crofton 1446	227 Chuck Hook	•					D008	Solder (1 can)

## 2022 WFF Pollution Prevention Plan

Bldg.	POC	NASA SUPER	Type of area					Codes	Description
			HW	Oil/Oily rags	Universal	Project	Parts Washer		
F16 103 AC Shop	Robert (Mike) Taylor 1134	227 Chuck Hook	•	•	•			Non, D001F002 F003 F005, UW, D001	Refrigerant oil (1x55G), Rags contaminated with TCE, petroleum distillates (1x30G), Batteries (1x5G), Thermostats from change-outs(1x5G), Aerosols(1x5G)
F16 124 Paint Shop	Greg Turner 1649	227 Chuck Hook	•					D001 D035 F003 F005, D001 D035 F003 F005	Paint related materials thinner (1x5G), Paint rags (1x5G), Aerosols (2x5G)
F-160 C125	Ed Woodring 2368	569 Lisette Martinez			•			UW	Batteries (1x5G)
F160 C120	Ed Woodring 2368	569 Lisette Martinez	•					D001	Alcohol (1 x5G)
F160 E114	Jason Freischlag 2352	840 Jeff Reddish	•					D001 F003	Jet Fuel /Acetone rags (1x 5G)
F160 E115	Jason Freischlag 2352	840 Jeff Reddish	•	•	•			D001, D001 F003, UW, D009	Fuel samples, oil + ethanol (1x5G), JP8, JetA, oil, ethylene glycol, IPA, solvent rags, acetone rags (1x5G), Batteries (1 can), Thermometers (1 can)
F160 E110	Brian Cornwell 1155	250 TJ Meyer	•					D001 F003	Acetone rags (1x5G)
F160 E108	Brian Cornwell 1155	250 TJ Meyer	•					D002 D007 D009 D011, D001 F003	Acetone, alcohol rags (1x5G)
F160 W146	Lari Ann Gentry 1766	250 TJ Meyer			•			UW	Batteries 11x1qt)
H-100 105	Jeff Matthews 757-894- 9883	840 Jeff Reddish			•	•		UW	Batteries (1x5G)
H-100 101	Jeff Matthews 757-894- 9883	840 Jeff Reddish	•					D001F002 F003 F005	Solvent rags from processing Cygnus (2x5G)
J-20 Hallway	Amy Barra 1148	130 Jeremy Eggers						NON	Alkaline battery 1x small can
J-100 GAC	Robert Wilt 1083	227 Mike Taylor						NON PFAS	PFAS bag filters (1x55g F OH)
M15 104	Larry Rovin 1112	810 Giovanni Rosanova	•					D001F002 F003 F005, UW	Alcohol acetone rags/ Ensolve rags(2x5G), UW batteries (1x5G)

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Bldg.	POC	NASA SUPER	Type of area					Codes	Description
			HW	Oil/Oily rags	Universal	Project	Parts Washer		
M15 108	Larry Rovin 1112	810 Giovanni Rosanova	•					D001 D008 F003	Aerosols (2x5G), Alcohol acetone rags/ Ensolve rags(1x5G)
M16 104	Larry Rovin 1112	810 Giovanni Rosanova	•			•		F002 F003 D001	Alcohol acetone rags (1x5G),
M-16 101	Larry Rovin 1112	810 Giovanni Rosanova	•		•				Aerosols(1x5G), UW batteries (1x5G)
N-159 Hangar C- 100 (5 SAA)	Bradly Watson 4610	830 Brian Bernth	•	•			•	D001F003 F005 D035, Non; D001	Solvent rags (3x55G), Oil (1x55G), Aerosols (1x30G), Jet A (1x 55G)
N-159 W143	Bradly Watson 4610	830 Brian Bernth			•			UW	Batteries(1x5G)
N159 PB W145	Bradly Watson 4610	830 Brian Bernth	•					D001D035F003 F005, D001D035F003 F005, D001	Paint Rags(1x5G), Paint Thinner(1x5G), Aerosols(1x5G)
N-159 E108	Bradly Watson 4610	830 Brian Bernth	•					D008	Solder (1 can)
N159 W232	Connie Kaczmarek 1564	830 Michael Cropper			•			UW	Batteries (1x5G)
N159 W142	Gary King 1038 Carl Schirtzinger 302-381- 6761	610 Dave Wolff	•					D008	Solder (1 can)
N-159 E106	Carl Schirtzinger 302-381- 6761	610 Dave Wolff	•		•			UW, D008	Solder (1 can)
N-159 E121	Katherine Wolff 2029	610 Dave Wolff	•					D008	Solder (1 can)
N161 Hall	Virginia (Ginger) Lamberson 1136	227 Chuck Hook			•			UW	Batteries (1x5G)
N162 Rm 104	Jeff Watson Jr 2092 Andrew Muender 1668	840 Jeff Reddish	•		•			UW, D008	Batteries (1xcan), Solder (1 can)
N162 114	Jamel Strand 1621	840 Jeff Reddish			•			UW	NiCad batteries from antennae controls change-outs(1x5G)
N162 115	John VanKleef 1447	840 Jeff Reddish	•					D008	Solder (2 cans)
N162 202	Jim Evans 1509	840 Jeff Reddish	•					D008, D001	Solder (1 can), Alcohol rags (1x5G)

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Bldg.	POC	NASA SUPER	Type of area					Codes	Description
			HW	Oil/Oily rags	Universal	Project	Parts Washer		
N162 203	Jim Evans 1509	840 Jeff Reddish	•					D008	Solder (1 can)
N165 100	Austin Taylor 2371	840 Jeff Reddish	•	•	•		•	Non, Non, D001 F003 F005 D035,UW, D001	Used oil from antenna changes(1x55G), PW Nonhaz, Solvent rags(1x30G), Batteries (1x5G), aerosols (1x5G)
U25 103	Tim Parks 2641	840 Jeff Reddish	•	•				D008, Non, D001	Solder (1 can), Oily rags (1x20G), aerosols (1x5G)
U30 100	Tim Parks 2641	840 Jeff Reddish	•	•				D008, UW	Solder (1 can), Batteries (1x5G),
U30 110	Tim Parks 2641	840 Jeff Reddish		•					Oily rags (1x55G)
U40 107	Tyler Holland 4866	840 Jeff Reddish	•		•			D001 F003 F005, D008, D001, UW	Rags with oil, grease, CRC 2-26, CRC3-36, alcohol, crud cutter; (1x30G), Solder (1 can), Aerosols (1x5G), UW Batteries (1 can)
U55 100	William Wallace 2751	840 Jeff Reddish	•					D008, non	Solder (1 can), Alkaline batteries(1x1qt), Oily rags (1x5G)
U70 101	Tim Branch 2789	840 Jeff Reddish	•		•	•		Non, D008, UW	Solder (1 can room 101), Nid batteries (1x5G)
V27 117	Lt Thomas Berry 2158	240 Edward (Tom) Northam		•	•			Non	UW batteries, oily rags (1x5G), grill grease (1x5G)
V-55 103	Mark Macaione 894-9866 Michael Fields	840 Jeff Reddish	•			•		D001	Alcohol rags(1x55G)
ASR 8 (near V66)	Kevin Downing 2858	840 Jeff Reddish	•	•				Non, D008	Used oil (1x55G), Oily rags (2x5G), Solder (1 can)
W15 104	Kevin Midder 824-6578	840 Jeff Reddish		•				Non	Used oil (1x55G)
W40 102	Michael (Mick) Sharpe 1418	840 Jeff Reddish	•	•	•			UW, D001, D008, D001 F003 F002 F001 F005 D035, non	Batteries(1x5G), Aerosols(1x5G), Solvent rags (1x30G, 1x5G) solder (1 can) Used oil (1x5G)
X15 112	Ryan Bitting 2977	840	•					D001F002F003, D002	Solvent rags (1x30G), Citric Acid (1x55G)
X30 101	Mark Marsh 2133	840 Jeff Reddish	•					D001 F003 F005 D035, D001 F003 F005 D035, D001 F003 F005 D035, non	Thinner (2x5G), Paint rags (1x55G, 1x5G), Spray gun clean (1x5G),



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Bldg.	POC	NASA SUPER	Type of area					Codes	Description
			HW	Oil/Oily rags	Universal	Project	Parts Washer		
X35 100	Mark Macaione 2730	840 Jeff Reddish	•	•				Non, D001 F003 F005 D035, D001	Used oil (1x5G), Solvent rags (1x55G), Aerosols (1x 5G), Blast grit (1x55G)
X79 Bay and logistics R?	Barbara Huffman 824-6520 Kevin Midder 824-6578 Chris Spiva 6580	840 Jeff Reddish	•	•	•			Non,UW,D001, D001 F003, D001, Non,	UW batteries (1x5G logistics area), Flamm Lab packs (1x5G), Acetone, alcohol, and AK225 rags (1x30G), Aerosols (1x5G),
Y50 101	Daryl Moore Cell: 540- 450-4044	840 Jeff Reddish	•					D001	Aerosols (1x30G)
Y55 101/	Jonathan Ysasi 2840	840 Jeff Reddish		•				F002, F003 F005 D035, Non	Rags with crc 226 paint simple green IPA oil grease (1x5G), Used oil (1 x5G)
Y55 200	Jonathan Ysasi 2840	840 Jeff Reddish	•					D008	Solder (1 can),
Z40	Daryl Moore Cell: 540- 450-4044	840 Jeff Reddish	•		•			D001, D001 F002 F003 F005, UW	Aerosols(1x8G), Solvent rags(1x30G), Batteries (1x5G)
Temporary HSWFR			•					D011	Silver Solder

### 13.2 Solid Waste Diversion and Recycling

Opportunities for solid waste diversion may include recycling, donation, reuse and repair.

Fiscal year 2022 recycling totals are included in Appendix A, Table A.2. Current recycling opportunities include:

- drum and pail reuse
- plastic beverage containers
- aluminum beverage containers
- toner cartridges
- scrap metal
- packing peanuts
- cardboard and paperboard
- white paper, colored paper, newspapers, and magazines

Recycling activities at WFF will be conducted in accordance with GPR 8500.3 Waste Management.

### 13.3 Green Purchasing

The Federal green purchasing program gives preference to:

- recycled content products
- Energy Star products
- water efficient products
- energy from renewable sources
- biobased products
- environmentally preferable products and services, including Electronic Product Environmental Assessment Tool (EPEAT) –registered electronic products
- alternative fueled vehicles and alternative fuels
- products with low or no toxic or hazardous constituents
- non-ozone depleting substances

Recycled content and biobased products will be discussed below.

### 13.3.1 Recycled Content Products

Federal agencies and their contractors are directed by Resource Conservation and Recovery Act (RCRA) Section 6002 to develop “affirmative procurement” programs to ensure that designated items with recycled content are purchased by the government and its contractors whenever possible, and to obtain a waiver if purchase of a designated item is not possible because of any of a number of pre-specified reasons. In addition, 40 CFR 247.6 requires affirmative procurement programs to have the following four elements: a preference program for purchasing designated items; a promotion program; procedures for obtaining and verifying estimates and certification of recovered material content; and annual review and monitoring of the program.

The Affirmative Procurement Program will be conducted in accordance with the protocols established in NPR 8530.1B Affirmative Procurement Program and Plan for Environmentally Preferable Products. Those initiating a purchase will be responsible for determining if the item is designated on the Environmental Protection Agency’s Comprehensive Procurement Guidelines (CPG) List. The Procurement Office will ensure that affirmative procurement is considered in every purchase and aid the initiator in market research.

The Environmental Office will enter CPG purchase data into the NASA Environmental Tracking System (NETS) annually to quantify and review the progress of the program. The Affirmative Procurement program will be promoted by the Environmental Office through Special Announcements, Safety and Environmental newsletter, Inside Wallops, Wallops All, Earth Day, America Recycles Day, training classes or other appropriate avenues. The Environmental office will also annually spot check estimates and certification of recovered material content on non-construction products. Certification of recovered material for construction related products will be checked by Facilities Management personnel.

### 13.3.2 Biobased Products

The Bio-Based program will be conducted in a similar manner to the affirmative procurement program. Those initiating a purchase will be responsible for determining if the item is on the

Department of Agriculture product designation list. All other elements of the program will mirror the affirmative procurement program.

## **14 Pollution Prevention Program Opportunity Assessment**

The P3 manager will examine the previous year's inventory against the baseline inventory to target opportunities for assessment. Once a candidate chemical or waste stream is selected, the P3 manager will search the past pollution prevention program project data base in Appendix A for similar previous projects. Then the P3 manager may form an assessment team or utilize an existing team to perform the opportunity assessment. The assessment team will examine the alternatives available for P3. Each opportunity assessment will identify the waste stream and its generating operation(s), describe the process, and present several pollution prevention alternatives. Each alternative will be described along with its advantages and disadvantages. Alternatives will be evaluated for their:

- effectiveness in achieving WFF's P2 goals,
- feasibility,
- ease of implementation, and
- return on investment.

The assessment team can use the pollution prevention survey forms to perform the opportunity assessment. An example of a survey form is found in Appendix B. This form contains questions and notes areas to examine when interviewing or working with personnel during an opportunity assessment.

Process owners will advise assessment team members of relevant safety procedures in each work area prior to the start of the assessment. Process owners will provide process descriptions and metrics which directly contribute of the success of the project. Once P3 alternatives are proposed, process owners will assist in the evaluation of the alternatives.

Once the opportunity assessment has been completed, results will be submitted to the process owner's organization along with the assessment team's recommendation for the preferred alternative for reduction. The process owner's organization will review the assessment and either approve the recommended alternative, another alternative, or deny funding for the P3 project.

Implementation of the projects shall be conducted by the process owner, with assistance from the assessment team. Effectiveness of the P3 project will be monitored by the assessment team, which will report to the program manager.

## **15 Annual Pollution Prevention Program Reporting**

The program manager will answer the annual Headquarters P2, Recycling, Solid Waste and Green Purchasing data calls and report the data in NETS.

**Appendix A**  
**Pollution Prevention Program Data**

Table A.1 Past Pollution Prevention Program Projects

Project Start	Location	Topic	File
1996 to Present	Facility-wide	Florescent Lighting and Exit Sign Upgrades - WFF saves \$45,000 annually in decreased energy costs.	70.02.03.12911 (2/1/2006)
1997	B-31, X-30	Paint Thinner Distillation - Paint thinner was distilled and reused. Paint shop employees were not satisfied with the reclaimed product.	
2000	F-8	Printed Circuit Board Shop – In early 2000, WFF switched from processing circuit boards on site to purchasing them off site. In 1997, the circuit board shop generated 5,123 pounds of hazardous waste. This is no longer generated.	38.05.01.12880 (12/10/2001)
2000	N-222	Wood Recycling – Wood recycling was tried for a few months, but vendor was not reliable and a suitable replacement could not be found.	
11/2001 to Present	Facility - wide	Class 1 ODS – Except for nominal amounts, the Class 1 ODS have been replaced except for Halon.	38.04.03.12962 (11/20/2001)
11/2001 to Present	E-2	Digital Photography – WFF switched from film photography and in-house processing to digital photography for all except high speed, outsourcing the processing of high speed film. This conversion eliminated the average hazardous waste generation of 1138 pounds per year from the photography lab.	38.05.01.12892 (12/10/2001)
2001 to Present	B-29	Chemical Reuse – WFF makes available chemicals that are in date but not needed by their organization available to other organizations through the Code 250 website. Although no chemicals are currently available, during 2005, \$500 of disposal cost was avoided through reuse.	38.06.03.7570
3/2004 to Present	F-10	Parts Washer – WFF participated in a NASA agency project to test various parts washer solvents. WFF tested Inland Technology Breakthrough solvent which is an odorless solvent that has a low vapor pressure to control VOC emissions. It is used in a parts washer which filters the solvent contaminants to 0.1 micron. The machine shop that tested the parts washer elected to purchase the parts washer.	38.04.01.12729 (11/5/2004)
6/04 to Present	Facility-wide	Green cleaning chemicals – WFF developed a spreadsheet to screen housekeeping chemicals and continually tests new replacements.	38.04.01.12890 (06/30/2004)

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Project Start	Location	Topic	File
6/04 to Present	Main Base	Plastic Recycling – Beginning with a pilot project, plastic recycling has increased from 3 building to 24 locations	
2005 to Present	Sites 2, 7, 10, 11, , 2, 20, 24, and F-8	Remediation – WFF restored 8.15 historically contaminated acres to residential levels. Restoration to residential levels is beyond what is required by the RCRA 7003 Administration Agreement on Consent.	
2005 to 2006	F-16	Glycol Recovery Unit - A recovery and distillation unit for a glycol/water mixture generated by the air conditioning shop was investigated. However, a cost effective unit could not be found.	
11/2005 to Present	Facility-wide	Non Paradichlorobenzene Urinal Screens – WFF replaced paradichlorobenzene screens with no para screens and eliminated 300 pounds of paradichlorobenzene in the environment per year.	38.04.01.12893 (06/30/2004)
1/2/06 to 4/1/06	Wallops Island	Christmas Tree project – Diverted from the landfill, donated Christmas trees were strategically placed at a cost savings of \$1100 to protect the \$500,000 runway which launched the first Unmanned Aerial Vehicle to fly into a hurricane.	70.03.01.12882 (06/08/2006)
2/2006 to 3/2009	B-31 and Facility-wide	Methylene Chloride – The sling test shop was looking for an effective fast-acting paint stripper to eliminate the hazardous effects of methylene chloride. Turco 6813E – Chemical Stripper was found to be a viable alternative. All users have either discontinued their use or are actively engaged in researching substitutes. Disposal of methylene chloride waste has decrease from 440 to 60 pounds annually.	38.04.01.12895 (2/1/2006)
05/06 to Present	F-16	Garage Glycol – The upgrade of ethylene glycol recycling equipment in the automotive garage eliminates the need for extender agents and has a return on investment of 1.1 years.	38.02.01.12900 (05/01/2006)
2006 to Present	E-109	Green Building –The new engineering building incorporates many green building features including building orientation for optimal energy performance, natural lighting and ventilation, central courtyard, and use of low VOC materials.	38.03.03.12961 (3/17/2003)
10/2006 to 6/2008	E-11	VOC Remediation Project – A VOC filtration technology was tested at WFF which could have kept 6500 pounds of VOC's from the environment a year. The VOC's are produced during air sparging at an old aviation tank farm remediation	38.05.01.12903 (06/12/2006)

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Project Start	Location	Topic	File
		site. However, the air sparging is currently not producing enough VOC to use the technology.	
2007 to 2008	Facility-wide	Electrical Metering – Electrical metering was installed on all buildings. This metering feeds the utility information system which engages buildings in energy savings competition and helps identify problem areas. Corrections made as a result of meters save 200,000 kW h annually.	
6/07 to 8/08	F-160	Mercury Replacement Pilot Project – WFF investigated the accuracy of several non-mercury thermometers which could replace mercury thermometers. Non- mercury thermometers were found to be less accurate than hoped and only one substitution was made at D-50.	
2008 to Present	Facility-wide	Building Tune-Ups – Adjusting HVAC operations at each building to include equipment schedules, outside air dampers, and night time schedules saves WFF \$25,000 annually.	
1/09 to 3/09	E-2	Grill Cleaner Substitution – A high pH grill cleaner used in the cafeteria was replaced with Scotch-Brite Quick Clean Griddle Liquid, a less toxic alternative	
3/09 to Present	D-8	Nozzle Cleaner Substitution - Gum Cutter Carb Cleaner, which contains toluene, xylene, and acetone, was replaced with a food grade cleaner, eliminating the hazardous waste associated with the use of the original product.	
10/08 to 9/2012	F-10	Metal Machining Coolant Recycling – Use of coolant recycler had prolonged the life of coolant life in the machine shop and with a 1 year pay back period, the reconditioning system has reduced off-site disposal by 45%.	
2009	N-159	Solar Powered Street Light Pilot Project – This project is projected to save 3000 kW per year.	
6/2009	E-2	Biodegradable Take-out Containers – The cafeteria began to replace the styrofoam containers with corn and paper take-out containers.	
7/09	E-107	Single Stream Recycling Pilot – A pilot project was starting to assess compliance with mixed stream desk-side recycling. See 2011 update.	Prelim 38.02.03.14954 (6/12/2002)
8/09	F-10	Closed Loop Water Jet – The Machine Shop upgraded its garnet metal cutting machine to a closed loop system saving 41,000 gallons of water.	
11/09 to 2010	F-16	Recycling of Cell phones – Cell phones are collected for donation to Cell phone for life. In	

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Project Start	Location	Topic	File
		FY2010, 86 phones were collected.	
10/2010 to 3/2011	WFF	Operation Clean Sweep – Base cleanup recycled all paper, cardboard, scrap metal, concrete, tires, and wood for a Main Base total of 241 tons.	
2011	WFF	Energy Savings Performance Project - New propane boilers at 35 buildings, electrical upgrades, and HVAC controls planned to result in a 99% reduction in direct SOx emissions per year (E4 Project), 53% reduction in direct NOx emissions per year, fewer aboveground storage tanks, and a 35% energy consumption reduction. See updates below.	
01/2011	WFF	Introduced Freecycle at Work to WFF community in Safety and Environmental newsletter.	
9/2011	WFF	Switched to Single Stream recycling – Cardboard, paperboard, aluminum cans, metal cans, glass, colored paper, newspapers, magazines and books with soft covers are all recycled in one container.	
2/2012	WFF	WFF received a certificate from Safety-Kleen stating that “NASA WFF avoided 37 metric tons of Greenhouse Gas Emissions (CO2e) through Safety-Kleen’s closed-loop recycling program for used oil from January 01, 2011 to December 31, 2011.”	
2/2012	WFF	All 46 remaining Nike motors sent for reuse to Naval Air Warfare Center Weapons Division in exchange for 24 Talos motors.	
12/2012	WFF	<p>The WFF Energy Savings Performance Project has accomplished the following:</p> <ul style="list-style-type: none"> <li>-Reduced pollutant emissions including greenhouse gases (99 percent reduction in sulfur oxides (SOX) and 50 percent reduction in nitrogen oxides (NOX), and a 40 percent reduction in greenhouse gases, a 39 percent reduction in carbon monoxide, a 17 percent reduction in VOC and a 39 percent reduction in particulates, exceeding the 18.3 percent requirement, These pollutant emissions reductions translate to the elimination of 20.9 tons of SOX, 9.85 tons of NOX, and 2761 tons of greenhouse gases.</li> <li>-Reduced 30 percent of energy consumption by 2012, well ahead of the 2020 target year goal,</li> <li>-Saved 1 million gallons of water per year or 3 percent of potable water previously consumed by</li> </ul>	



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Project Start	Location	Topic	File
		central steam plant exceeding the 2 percent annual requirement for 2012, -Eliminated 20 fuel oil tank systems and their associated environmental liability, and -Administered upgrades from R-22 refrigerant to non-ozone depleting R-410a on air-conditioning units.	
2/2013	WFF	VEEP Project - Reduction in Sulphur Oxides (SOx) from 6.86 tons to 0.68 tons as a result of switching form #6 fuel oil boilers to propane.	
2/2013	WFF	VEEP Project – Single Stream Recycling increased from 52.5 tons in 2011 to 62.4 tons in 2012. (See 2014 entry below)	
2/2013 to 9/2016	WFF	VEEP Project – Reduced the tons of fuel oil stored in above ground storage tanks by installing geothermal heating ventilating and air conditioning systems at WFF. Reduced from 405,361 tons in 2011 to 256,743 tons in 2012. Reduced tons used (note change to used) from 276.9 tons used in 2013 to 130 tons used in 2014 to 102 tons used in 2015 and 125.9 tons used in 2016.	
2/2013	WFF	VEEP Project – Restored 0.46 acres to residential levels in 2011, 1.0 acres in 2012, 6.07 acres in 2013, 0.1 acres in 2014, 0.08 acres in 2015, 0.18 acres in 2016, 0.1492 acres in 2017, 0 acres in 2018.	
2013	E-109	Collecting data and completing building tune-ups to certify Building E-109 as a LEED EB Building	
2014	WFF	VEEP Project – Single Stream Recycling increased from 52.5 tons in 2011 to 62.4 tons in 2012 to 63.8 tons in 2013. 2014 showed a decrease to 40.32 tons. 2015 showed an increase to 45.39 tons. 2016 showed an increase to 50.4 tons. 2017 showed a decrease to 47.1 tons. 2018 showed an increase to 50.4 tons. Project is on-going.	
2014	E-109	Building E-109 achieves LEED EB certification adding 52,779 square feet of LEED certified space to NASA’s total.	
2014 to 2016	X-79	VEEP Project - A hybrid cooling system was installed at Building X-79. The hybrid system uses both geothermal and the existing cooling tower. The geothermal system will be used as much as possible to reduce the gallons of water used by the cooling tower. From 2013 to 2015, there was	

## 2022 WFF Pollution Prevention Plan

Project Start	Location	Topic	File
		reduction from 634,000 gallons to 295,000 gallons to 126, 000 gallons. 233,000 gallons were used in 2016.	
2015	WFF	CHARGE Wallops – Charging Hubs for Accessories and Reuse of Government Excess - This project would utilize excess solar panels and batteries to provide 12-volt DC current in E-2 Cafeteria and on a mobile trailer to power USB charging stations for cell phones, laptops, and other mobile devices. This project started in 2015 in the design phase and as of 2018 is not yet operational.	
2016 to 2017	WFF	WFF is collaborating with HQ NASA Technology Evaluation for Environmental Risk Mitigation (TEERM) office based out of KSC, to evaluate metal coatings used on NASA’s launch facilities and aircraft. The primary objective of this effort is to demonstrate and validate environmentally-preferable alternatives which can then be added to the NASA’s approved product list. The focus of the project is corrosion resistance and survivability, with the goal to reduce the amount of maintenance required to preserve the performance of launch facilities and aircraft, while reducing down time and mission risk. Test panels were prepared and in coordination with MARS, attached to the launch facilities at Pad 0A prior to the Oct 2016 and November 2017 launches. Test panels were also attached to the WFF sounding rocket launchers to test their durability against solid rocket propellant. The post-launch results are currently being evaluated. C-130 and P-3 aircraft panels were prepared and are ready to be installed on WFF assets when those two aircraft are in annual maintenance.	
2017	M-15/M-16	Bikes are used to travel between Building M-15 and M-16, reducing vehicle emissions in this area.	
2017	MLCC	Within the scope of the MLCC project, the LEED subcontractor researched the availability of recycling rigid foam insulation. No options were found.	E/38.02.03/2017
2017	GSFC wide	DRInK - Direct reduction in Kilowatts proposed to WEMA, GEMA, and GSFC Code 200 Management. The project would remove the lamps	E/38.08.03/2017

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Project Start	Location	Topic	File
		from drink machines (projected 30% energy savings) and install Vending Misers (projected 50 percent energy savings) to the machines. The project is projected to save GSFC 1,100 MWh in five years.	
2017	GSFC wide	NASA RIDES (Reduction in Driving Emissions and Smog) – This contest was proposed to GSFC Code 200 Senior Management as a way to encourage the reduction of indirect Greenhouse Gas emissions to meet the NASA SSPP Goal 1 by 12.3% by 2020.	E/38.08.03/2017
2017	WFF wide	Carpooling to Greenbelt, MD – Information is available in MOSI to assist those needing to travel to Greenbelt, MD with the travelers name and date of travel so that multiple government vehicles do not need to be taken to GSFC on the same day.	E/25/09/draft issues/safety newsletter rough publication76th
2017	W-40/X-15	VEEP project - This project will track use of Honeywell's Solstice PF, non-ozone depleting chemical, against the declining use of AK-225, an ozone depleting chemical. Values reported will be pounds of Honeywell's Solstice PF used in building W-40 and /or X-15. In 2017 0.5 lbs/28 lbs, in 2018 0/30 lbs of Soltice used/lbs of AK-225 used, respectively.	
2018	MOCC/ Island Firehouse	MLCC name changed to MOCC. MOCC and Island Firehouse received LEED silver certification. Contact Code 228 project managers R. Simko and R. Stanley for more information.	
2018	F16 Garage	The F-16 garage collaborated with Code 250 to substitute the previously used BRAKLEEN (contains Trichloroethylene), containing chlorinated solvents for the non-chlorinated BRAKLEEN.	
2019	WFF wide	WFF Bike Share Program - WFF placed 20 bicycles for WFF use. Initially the bicycles were placed at <ul style="list-style-type: none"> <li>• E building complex</li> <li>• F-1 (1)</li> <li>• F-6 (1)</li> <li>• F-10 (1)</li> <li>• F-16 (1)</li> <li>• F-160 (1)</li> <li>• N-161 (1)</li> </ul>	

## 2022 WFF Pollution Prevention Plan

Project Start	Location	Topic	File
2019	WFF wide	Solar Project - Installation of solar arrays on 18 acres located southeast of runway 4-22 and three carport solar arrays in the main parking lot located immediately south of F-6.	
7/2019	WWTP	Use of Biosolids from FOTW - Intern research project. Outcome was that it was not cost effective to treat biosolids to Class A.	
2019	N162, E107, Y-55	New HVAC systems were installed at buildings N-162 and E-107 and the building envelope at building Y-55 was repaired, resulting in improved energy efficient and cost savings	
2019	WFF wide	The Environmental Office in coordination with our parent Greenbelt location implemented a new online tool in MOSI to review the environmental and safety impacts of projects in the early planning stages. Ultimately this tool allows for reviewers to point out green purchasing and recycling opportunities at project formulation.	
2021	D-1/N-159	Range aircraft office	
2021	N-159, E-104, E-105, E-106, E-107, and E-108	VEEP Project: HVAC Energy Efficiency Project. Installed 2 Waterside Economizer Low Ambient Dry Coolers to replace existing HVAC at Buildings. Energy costs will be skewed by reduction of employees utilizing these buildings due to Covid-19. HVAC settings were not altered during the reduced use.	
2021	F-5, F-6, E-100, and J-20	VEEP Project: Retro-commissioning of buildings for improved energy savings. Energy costs may be skewed due to Covid-19 and reduction of employees in these buildings. HVAC settings were not altered during the reduced use.	
2021	Airfield	VEEP Project: Renewable Solar Energy Generated. Newly constructed Airfield 3.5MW Photovoltaic project. Energy cost savings of \$490, 739.00 which did not need to be purchased.	
2022	F10	NSROC (Code 810) researches Acrastrip, as a possible a non-hazardous, eco-friendly "green" replacement for acetone and finds it to be soapy water and not useful for their purposes.	
2022	D1	Code 840 purchased a 1000 gallon fuel bowser to contain jet fuel after defueling instead of containerizing the fuel as hazardous waste.	

Table A.2 Wallops Flight Facility (WFF) Recycled Material:  
Fiscal Year 2022

Item	Quantity (tons)
Batteries (combined)	1.0
Comingled (Mixed Recyclable Material)	45.8
Concrete	1512
Fluorescent and UV Lamps, Mercury Devices, and Lead Solder	0.6
Scrap Metal	134.5
Tires (1 for 1 swap)	0.50
Used Oil	8.3
Cooking Grease	1.1
Electronics	5.9
Toner Cartridges	1.1
Cardboard	0.7
C&D Projects	1.3
Transformer Oil	4.4
Wood (Pallets)	2.4
Total	1719.6.

**Appendix B**  
**Pollution Prevention Program Opportunity Assessment Survey Form**

**Pollution Prevention Program Opportunity Assessment Survey Form**

Date:

Assessment Team:

Unit Designation, Shop Name, Building:

Description of Operation:

Chemicals Used:

Wastes Generated:

Current Waste Minimization Practices:

Problems:

**Waste Minimization Opportunities:**

Alternative 1:

Prevention Type:

Estimated Reduction:

Technical Evaluation (feasibility and ease of implementation):

Economic Evaluation

Investment Cost:

Annual Savings:

Payback Period:

Alternative 2:

Prevention Type:

Estimated Reduction:

Technical Evaluation (feasibility and ease of implementation):

Economic Evaluation

Investment Cost:

Annual Savings:

Payback Period: