

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
White Sands Test Facility
P.O. Box 20
Las Cruces, NM 88004-0020



November 29, 2011

Reply to Attn of: RA-E11-119

New Mexico Environment Department
Attn: Mr. John Kieling, Acting Chief
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Subject: NASA White Sands Test Facility (WSTF) 2011 Waste Minimization Plan

Enclosed is the 2011 Waste Minimization Plan as required by the WSTF Hazardous Waste Permit No. NM8800019434. Enclosure 1 provides a paper copy of the document. Enclosure 2 provides an electronic copy of the document on CD-ROM. This report has been prepared for fiscal year 2011. Being a federal facility, NASA tracks recycling and related waste activities on a federal fiscal year basis (October 1 to September 30). This approach maintains consistency with previous submittals and ensures a complete and accurate report.

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

If you have any questions or comments please contact Tim Davis of my staff, at 575-524-5024.

A handwritten signature in black ink, appearing to read "Radel Bunker-Farrar".

Radel Bunker-Farrar
Environmental Program Manager

2 Enclosures

cc: (with enclosures)
New Mexico Environment Department
Attn: Mr. Dan Comeau
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505



National Aeronautics and
Space Administration

Hazardous and Solid Waste Amendments (HSWA) Waste Minimization Report

October 1, 2010 to September 30, 2011

NM8800019434
NASA Johnson Space Center White Sands Test Facility
12600 NASA Road Las Cruces, New Mexico 88012

NASA Johnson Space Center White Sands Test Facility
Hazardous and Solid Waste Amendments (HSWA)
Waste Minimization Report

October 1, 2010 to September 30, 2011

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Radel Bunker-Farrah
Program Manager, NASA Environmental Program

11-29-11

Date

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List of Acronyms

CSS	Component Services Section
EMP	Environmental Management Plan
EMS	ISO 14001 Environmental Management System
EO	Executive Order
EPA	United States Environmental Protection Agency
ETU	Evaporation treatment unit
FTU	Fuel treatment unit
FY	Fiscal year
GAC	Granular activated carbon
gal	Gallon(s)
GSA	General Services Administration
HSWA	Hazardous and Solid Waste Amendments
IDW	Investigation-derived waste
IPA	Isopropyl alcohol
ISO	International Organization for Standardization
kg	Kilogram(s)
lb	Pound(s)
LOX	Liquid Oxygen
MPITS	Mid-plume Interception and Treatment System
MSDS	Material Safety Data Sheet
MW	Megawatt
NASA	National Aeronautics and Space Administration
NETS	NASA Environmental Tracking System
NMED	New Mexico Environment Department
OFEE	Office of the Federal Environmental Executive
OMS-E	Orbital maneuvering subsystems-engine
P2	Pollution prevention
PCE	Tetrachloroethene
PFTS	Plume Front Treatment System
POTW	Publicly Owned Treatment Works
SSPP	Strategic Sustainability Performance Plan
TCE	Trichloroethene
TES	Total encapsulating suit
WSIT	WSTF Sustainability Initiative Team
WSTF	NASA Johnson Space Center White Sands Test Facility
VCM	Volatile condensable material

1.0 Introduction

The New Mexico Environment Department (NMED) Hazardous Waste Permit (Permit), issued to the National Aeronautics and Space Administration (NASA) Johnson Space Center White Sands Test Facility (WSTF) became effective December 9, 2009. The Permit requires that WSTF institute a waste minimization program to reduce the volume and toxicity of hazardous wastes generated by the Facility's operation, to the degree determined by NASA to be economically practicable.

2.0 Objectives and Scope

The Permit requires that WSTF submit a copy of the annual certified statement regarding the waste minimization program to NMED by December 1st for the previous 12-month period ending September 30. The reporting period included in this document is October 1, 2010, through September 30, 2011, or NASA fiscal year (FY) 2011.

The WSTF source reduction, recycling, and planning activities for this reporting period are addressed below. The Permit requirements are listed below with a response following each requirement.

3.0 Waste Minimization Program Plan Components (Permit-specified)

3.1 Policies and Programs

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Any written policy or statement that outlines goals, objectives, and methods for source reduction and recycling of hazardous waste at the Facility.* This section includes descriptions of existing policies and ongoing programs that support waste minimization at WSTF.

3.1.1 Environmental Management System

NASA has defined goals encompassing quality (including ISO 9001:2008), safety, and environmental, (including the ISO 14001 Environmental Management System [EMS]) and placed these goals into a single management system. The WSTF Policy Directive was revised to incorporate the EMS policy into a single WSTF Management Policy.

The policy commits WSTF to environmental excellence by using EMS procedures that evaluate and update environmental aspects, ranks their significant environmental impacts, and establishes environmental objectives and targets. This determines how the impacts are managed for regulatory compliance, pollution prevention, waste generation reduction, and resource conservation (materials, energy, water, and fuel).

An Environmental Management Plan (EMP) was established for each significant aspect defined at WSTF for NASA FY2011. The FY2011 significant aspects and associated EMPs were:

- Energy efficiency and water conservation.
- Groundwater contamination.
- Hazardous materials management.
- Sustainable acquisition.
- Sustainability.

WSTF is committed to the reduction of natural resource consumption. Several of the FY2011 EMPs outlined objectives and targets for the reduction of natural resource consumption.

Significant progress was made in FY2011 toward targets listed in the Energy Efficiency and Water Conservation EMP. Projects included:

- The installation of natural gas meters on six buildings.
- Installation of energy saving light fixtures and lighting management systems in two buildings.
- A 1.0 megawatt (MW) solar energy project in progress.
- An agreement with an off-site contractor to conduct studies for potential energy efficiency and renewable energy projects.

Water conservation efforts are ongoing; including the installation of water saving fixtures as facility restrooms are upgraded.

Groundwater contamination was retained as a significant aspect in FY2011. The Plume Front Treatment System (PFTS) and the Mid-plume Interception and Treatment System (MPITS) are management priorities. The MPITS began operation in March 2011. Both systems are remediating groundwater contamination.

Achieved targets listed in the FY2011 EMP for Hazardous Materials Management included: 1) evaluation of facility departments needs; and 2) upgrade to Version 8 of Material Safety Data Sheet (MSDS) Online. The MSDS and materials management system, MSDSONline^{®1} Version 8 is an interactive tool utilized by site personnel to track chemical inventories.

The objective for the FY2011 Sustainable Acquisition EMP was to develop a procedure for buying green. A draft procedure is undergoing a stakeholder review. Requirements are set for federal agencies to reduce resource use by procuring products that are made of recovered or recycled materials, energy efficient, biobased, water conserving, non-ozone depleting or other environmentally preferable materials. WSTF environmental personnel currently evaluate contractor purchase requests for waste minimization, pollution prevention, sustainability, and affirmative procurement.

The FY2011 Environmental Sustainability EMP objectives focused on:

- Continuing a site-wide sustainability awareness program.
- Documenting WSTF sustainable actions and initiatives to show continual improvement.
- Increasing waste diversion through cost-effective waste prevention and recycling programs. The EMP is managed by the WSTF Sustainability Initiative Team (WSIT).

3.1.2 Sustainability at WSTF

WSTF management recognized that the depletion of natural resources threatened to significantly impact the environment at WSTF. As a result, sustainability was established as an EMS significant aspect in FY2005. WSIT was established at that time to evaluate and advise management in areas of environmental stewardship and sustainability. NASA funding of task plans provides monies for the WSTF Sustainability Team's efforts. WSIT plays multiple roles in the sustainability initiative. The team represents the WSTF

¹ MSDSONline[®] is a registered trademark of Kelleher, Helmrich, & Associates, Inc.

community's environmental conscience, gathers and disseminates information on the various aspects of sustainability, advocates for employees' ideas, documents site sustainable actions, and provides a mechanism for implementing change.

Many WSTF programs that existed prior to 2005 fall under the umbrella of sustainability. Ongoing programs including, pollution prevention (P2), waste management, and recycling have been administered by the WSTF contractor Environmental Department in accordance with federal laws and executive orders as well as NASA procedural requirements. Measures to reduce hazardous wastes, minimize the use of toxic substances, and improve environmental performance at WSTF have been successful and WSTF has been evolving toward environmental sustainability for many years. With the establishment of sustainability as an EMS significant aspect came the opportunity to greatly accelerate WSTF's progress toward environmental sustainability by involving the entire WSTF community.

With the 2009 promulgation of Executive Order (EO) 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," each federal agency was required to prepare and implement a Strategic Sustainability Performance Plan (SSPP). NASA submitted the first plan in the summer of 2010, and as required in the EO, the first annual update to the SSPP was submitted in August of 2011. Sustainability goals set forth for federal agencies in the EO were adopted by NASA in the SSPP. Because NASA has been working toward environmental sustainability for many years, the establishment of the SSPP goals has been taken in stride; providing solid guidance for targets and reporting metrics. WSIT provides support to NASA and contractor stakeholders that are working toward the SSPP goals.

The 2011 SSPP goals include greenhouse gas reduction, high performance sustainable buildings and renovations, water use efficiency and management, pollution prevention and waste reduction, and electronics stewardship.

The continuous waste stream review and characterization activities evolved during the preparation for the issuance of the 2009 NMED Hazardous Waste Permit. These activities have prompted a closer look at waste generation and minimization. Hazardous waste generation processes, improved waste determinations, and generator attention to waste stream constituents and concentrations continue to reduce waste.

The WSTF Environmental Department maintains records of sustainable actions in the areas of recycling, hazardous and solid waste minimization, resource conservation, and environmental stewardship. Fiscal year data are entered into the NASA Environmental Tracking System (NETS). NETS information is gathered for required NASA-wide reporting in the annual SSPP. NETS reporting information continues to be used on-site for tracking waste and minimization projects.

3.2 Training and Incentive Programs

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities;*

EMS awareness training continues to be delivered to newly hired personnel in the environmental briefing portion of the new hire orientation. The material emphasizes sustainability, pollution prevention, continuous improvement, and compliance with environmental laws. In addition, a new training module, "Environmental Compliance Awareness," has been instituted that serves as a refresher for waste minimization and other environmental programs.

WSIT has been working to strengthen the sustainability culture at the site. The team realized that awareness was the first step toward imbedding sustainability in the minds of the WSTF community. WSIT has campaigned to raise employee awareness through various forms of communication, such as WSIT NewsFlash emails, the WSIT SharePoint website, sustainability presentations, and posting articles in the two WSTF newsletters; the bi-weekly "Porcelain Press" and the monthly "What's Going On at WSTF." WSIT annually celebrates America Recycles Day (November 15th) and Earth Day (April 22) with site-wide awareness events.

Environmental excellence remains a high priority of WSTF management with the goal to increase environmental awareness across the site. In addition to formal training sessions, WSTF management personally emphasizes the site objective of achieving environmental excellence via frequent employee all-hands meetings. Environmental awareness, process reminders, site accomplishments, program visibility, and individual recognition are shared using the site newsletter and posted bulletins.

3.3 Source Reduction and Recycling Measures

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Any source reduction and/or recycling measures implemented in the last five years or planned for the near future.*

Historically, WSTF's remoteness and lack of access to a publicly owned treatment works (POTW) have required that WSTF currently manage several non-hazardous waste streams in a permitted hazardous waste operating unit. During FY2012, WSTF will complete construction on a sewer line and sewer system upgrades that will connect WSTF to the City of Las Cruces' POTW. With the completion of this project, the sewage lagoons and septic tanks on-site will no longer be utilized. WSTF is working with the City of Las Cruces to determine which non-hazardous waste streams will utilize the new sewer line.

In tandem with this project, the closure of the evaporation treatment unit (ETU) in the 200 Area will be completed by August 2012. All hazardous waste streams that currently utilize the evaporation tanks will either be eliminated or reduced and containerized for off-site disposal. As of December 9, 2009, waste fuels (P068, U133, U099) previously diluted and treated in evaporation tank are no longer treated in the ETU. All fuels are being treated at the fuel treatment unit (FTU).

On-site hazardous waste treatment was greatly reduced in FY 2011. With the exception of investigation-derived wastes (IDW) and decon water contaminated with oxidizer, all wastes listed have been diverted to off-site shipment. In many cases, source reduction has occurred as a result of a reduction in work associated with waste generation.

WSTF is implementing a phased approach to sustainable acquisition, which includes the replacement of toxic cleaning products with products containing biobased materials. Specific source reduction and recycling measures for the current reporting period and future plans are presented in [Appendix A](#).

3.4 Operating Costs

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *An itemized list of the dollar amounts of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous waste.*

Capital expenditures and operating costs associated with source reduction and recycling are not specifically tracked; however, activities initiated and/or continuing during the reporting period reflect

significant investments and cost avoidances. For example, as part of the WSTF property management process, in FY2011 almost 4 tons (3,538 kg; 7,800 lbs) of electronic equipment (e-scrap; including toner cartridges) was recycled through UNICOR, a Federal Prison Industries work program in. In addition, 780 kg (1,715 lbs) of scrap metal and 2,008 kg (4,418 lbs) of unused photographic film were recycled in FY 2011.

NASA also continued funding of WSIT. For FY 2011, the WSIT allocated budget was \$62,000. Community partnerships established over the last several years have enabled WSTF to continually increase the types and volume of (non-hazardous) recyclable materials at minimal cost. The recycling of non-hazardous materials has evolved from a grassroots effort and the success of the program is due to the voluntary participation of WSTF employees.

3.5 Limiting Factors

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Factors that have prevented implementation of source reduction and/or recycling.*

NASA tests and evaluates spacecraft materials, components, and propulsion systems to enable the safe exploration and utilization of space. NASA test programs are dependent upon federal funding and many projects are funded on a program-by-program basis. One-time, short-term, and inconsistent testing generates dynamic and variable waste streams that are difficult to manage for source reduction and recycling due to customer/test requirements, military specifications, original equipment manufacturer specifications, and program timelines. During this period, WSTF continued to provide support for Space Shuttle readiness and safety efforts. Future NASA programs, National Defense System rocket engine testing, missile demilitarization, and decommissioning and decontamination of antiquated aerospace equipment will increase customer testing requirements and limit the feasibility of source reduction.

3.6 Information Sources

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Sources of information on source reduction and/or recycling received at the facility (e.g., local government, trade associations, suppliers, etc.).*

The NASA Principal Center for Regulatory Risk Analysis and Communication reviews the federal register and issues emails with specific information pertaining to changing regulations. The reviews often necessitate white papers and regulatory reviews to evaluate impacts to WSTF operations.

WSTF personnel also participate in NASA-sponsored sustainability, recycling, sustainable acquisition, and pollution prevention workshops and video conferences to share information about recycling, sustainability, and pollution prevention strategies among NASA centers. During this reporting period, WSTF employees continued to participate in the New Mexico Recycling Coalition. WSIT representatives attended the first annual GreenGov conference and the NASA recycling and sustainable acquisition biennial workshop. Both of these events were centered on EO 13514, the federal sustainability goals. WSTF personnel also use information available online (NMED, United States Environmental Protection Agency [EPA], Office of the Federal Environmental Executive [OFEE], and NASA sources), which continuously offer information related to source reduction and recycling.

3.7 Additional Waste Minimization Efforts

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *An investigation of additional waste minimization efforts which could be implemented at the facility. This*

investigation shall analyze the potential for reducing the quantity and toxicity of each waste stream through production reformulation, recycling, and all other appropriate means. The analysis shall include an assessment of the technical feasibility, cost, and potential waste reduction for each option.

WSTF procedures require periodic review of all WSTF waste streams. This evaluation includes generation process changes, contaminant concentrations, quantity variations, waste determinations, and potential changes to minimize waste generation. Budget constraints paired with sustainable thinking have spurred creative and economic solutions for waste minimization.

The WSTF operational organizations continuously research equipment replacement, product replacement, and product conservation efforts. For example, the Propulsion Test Department has implemented a distillation unit that reduces non-volatile residue in its fuel conditioning process and maintains product integrity for reuse. The Component Services Department is working with an off-site contractor for rinse water reclamation and routing of the reject water from the reverse osmosis generation units to cooling towers or other operations. Rinse water from the gross cleaning process will also be recycled back into the de-ionization loop.

3.8 Hazardous Waste Matrix

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *The Permittee shall submit a flow chart or matrix detailing all hazardous wastes it produces by quantity, type, and building/area.*

The hazardous waste matrix ([Appendix B](#)) identifies the WSTF hazardous waste streams by number, waste name, generation building, area, and the generator's annual estimated quantity.

3.9 Limitations to Waste Reduction

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *The Permittee shall demonstrate the need to use those processes which produce a particular hazardous waste due to a lack of alternative processes or available technology that would produce less hazardous waste.*

Testing at WSTF supports the federal aerospace industry. The wastes generated in association with this testing are derived from the following processes: engine firings; developmental research; equipment cleanliness/repair; missile demilitarization; aerospace equipment decommissioning and decontamination; facility construction/maintenance; and computer and electrical support. These wastes are often dependent upon contractor test requirements, military specifications, program timelines, and additional conditions mandated by contracts.

Appendix A
Source Reduction and Recycling Tables

Table A-1 WSTF Hazardous Waste Source Reduction (Oct. 1, 2010 – Sept. 30, 2011)

YEAR	SOURCE REDUCTION EFFORT	NET REDUCTION
2011	Sixty groundwater wells continue to utilize dedicated low-flow sampling equipment that was approved by NMED. The technology allows continued use of current well structures, avoids drilling new wells, and minimizes generation of purge water (hazardous waste identified as IDW). Due to reduced sampling requirements implemented with the NMED approval of the 2010 Groundwater Monitoring Plan, the net reduction has decreased since 2010.	28,000 gal
2011	Contamination Control continued emptying cleaning tanks with corrosive solutions (Oakites) on a yearly schedule, rather than weekly (as performed previously), with tank recharge as needed.	185 gal

Table A-2 WSTF Hazardous Waste Recycling (Oct. 1, 2010 – Sept. 30, 2011)		
YEAR	HAZARDOUS WASTE RECYCLED	NET REDUCTION
2011	Nickel-Cadmium batteries were collected and shipped off-site for recycling as universal waste rather than hazardous waste.	185 kg (407 lb)
2011	Lithium batteries were collected and shipped off-site for recycling as universal waste rather than hazardous waste.	69 kg (152 lb)
2011	Lead Acid batteries were collected and shipped off-site for recycle as universal waste rather than hazardous waste.	1,190 kg (2,618 lb)
2011	The Valve Shop continued collecting Fomblin oil, a fluorinated halocarbon oil, for off-site recycle. The recycling effort will reduce the hazardous waste generation and costs involved with repurchase of this very expensive product.	5 gal
2011	The Facilities Maintenance Group collects mercury containing lamps which are recycled as universal waste.	450 kg (990 lb)
2011	Unused film was collected and shipped off-site for recycle as solid waste rather than hazardous waste	2,008 kg (4,417 lb)

Table A-3 WSTF Hazardous Waste Source Reduction/Recycling Future Plans (Oct. 1, 2010 – Sept. 30, 2011)

YEAR	PLANNED SOURCE REDUCTION/RECYCLING	NET REDUCTION
2010 and beyond	NASA personnel have chosen the technology and are in the process of design review and procurement of equipment for a distillation system that has the capability of maintaining propellants within the parameters required by NASA customer driven specifications. The system will avoid the high cost of new propellant and monies required for labor, dilution, and disposal of potential hazardous waste.	TBD
2010 and beyond	NASA continues to be an integral support system for the space effort. WSTF support is critical in NASA's ability to test engines at simulated altitudes. The Propulsion Test Office will continue to test systems that use methanol, liquid oxygen (LOX), and other propellants instead of hydrazine(s) and nitrogen tetroxide in an effort to reduce generation of wastes that are hazardous and more toxic.	TBD
2010 and beyond	The NASA Plume Front Groundwater Remediation System continues to treat groundwater contaminated with trichloroethene (TCE), tetrachloroethene (PCE), Freon-113, Freon-11, and N-Nitrosodimethylamine.	> 99.9 %
2010 and beyond	A NASA Mid-plume Groundwater Remediation System is capturing contaminant mass in the Mid-plume area. The targeted contaminants in groundwater are Freon-113, TCE, PCE, Freon-11, and N-Nitrosodimethylamine.	> 99.9 %
2010 and beyond	Studies and initiatives for alternatives for the supply of electricity to run the NASA WSTF Groundwater Remediation System continue to be evaluated. The alternatives include wind, solar, and fuel cells.	TBD
2010 and beyond	The Chemistry Laboratory and Environmental Departments continue to investigate requirements and processes that involve waste minimization/elimination of the scrubber fluids from fume hoods in the labs.	TBD
2011	NASA recycled 3,840 lb (1,742 kg) of Space Shuttle fuel cells for precious metal (gold and silver). Approximately 151.6 lb (68.8 kg) of gold and 0.32 lb (0.145 kg) of silver were recovered.	> 99.9 %
2011 and beyond	NASA is evaluating the potential for precious metal (gold, platinum, and palladium) recovery from additional Space Shuttle Fuel Cells.	TBD
2012	Connecting with the City of Las Cruces Publicly Owned Treatment Works will enable NASA to significantly reduce waste, avoid sewage lagoon use, and allow elimination of the 200 Area ETU.	TBD

Appendix B
Hazardous Waste Matrix

**Table B-1 FY2011 WSTF Hazardous Waste Generation Matrix
Off-Site Recycling and Treatment in FY2011**

Waste	Weight
Nickel cadmium batteries (cadmium D006) were recycled as universal waste – off-site. Stored in 150 drum storage facility (prior to shipment).	185 kg (407 lb)
Off-spec nickel cadmium batteries (cadmium D002, D006) were recycled as hazardous waste – off-site. Stored in 150 drum storage facility (prior to shipment).	119 kg (262 lb)
Lead acid batteries were recycled as universal waste – off-site. Stored in 150 drum storage facility (prior to shipment). Additionally, lead acid batteries are recycled by core exchange when new batteries are delivered by the vendor.	1,190 kg (2,618 lb)
Lithium batteries (D003) deactivated as universal waste - off-site. Stored in 150 drum storage facility (prior to shipment).	69 kg (152 lb)
Silver zinc batteries (D011) recycled as universal waste – off-site. Stored in 150 drum storage facility (prior to shipment).	None shipped in FY2011
Silver oxide batteries (D011) recycled as universal waste – off-site Stored in 150 drum storage facility (prior to shipment)	2 kg (4 lb)
Mercury batteries (D009) recycled as universal waste – off-site. Stored in 150 drum storage facility (prior to shipment)	1 kg (2 lb)
Spent dry cell (alkaline) batteries (non dot regulated) recycled as solid waste – off-site. Stored in 150 drum storage facility (prior to shipment)	180 kg (396 lb)
Spent photographic film (non DOT regulated) recycled as solid waste – off-site. Stored in 161 container storage unit (prior to shipment)	2,008 kg (4,417 lb)
Scrap metal (non DOT-regulated) recycled as scrap metal – off-site. Stored in building 155 WSTF recycling center (prior to shipment)	780 kg (1,716 lb)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
MERCURY/MERCURY CONTAMINATED REFUSE (D009) STABILIZED OFF-SITE BY CLEAN HARBORS STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 0 lbs in FY 2011				
10-20-26	Contaminated Mercury Materials (w/D006)	100/200	Environmental Department	0 kg (0 lb)
20-10-01	Used Mercury	203	Calibration	0 kg (0 lb)
20-10-02	Mercury Contaminated Debris	203	Calibration	0 kg, (0 lb)
80-01-05	Mercury Contaminated Debris	800	Lab Tests	0 kg (0 lb)
X-RAY FILM AND FIXER SOLUTION (SILVER D0011) INCINERATED OFF-SITE BY CLEAN HARBORS, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 196 lbs in FY 2011				
20-02-14	Waste X-Ray Fixer Solution	203	Met Lab	20 gal/89 kg (196 lb)
WASTE PAINT AND ADHESIVE (D001, D002, D005, D006, D007, D008, D009, D018, D035, D039, D040, F002 F003) INCINERATED OFF-SITE BY CLEAN HARBORS . STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 1,058 kg (2,377 lb) off-site in FY 2011				
10-03-01	Paints Pourable/Solvent	Site	Facilities Construction/Maintenance/ Site	36 kg (80 lb) 10 gal
10-03-03	Spent Paint Booth Filters	158	Facilities Construction/Maintenance	15 kg (33 lb)
10-03-06	Off-spec Paints	Site	Facilities Construction/Maintenance/ Site	833 kg (1833 lb) 186 gal
10-03-07	Contaminated Debris	Site	Facilities Construction/Maintenance/ Site	104 kg (229 lb)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
10-20-05	Aggregated Aerosol Wastes	161	Environmental Department	0 kg, (0 lb) 0 gal
20-02-45	Waste Epoxy Slurry	200	Labs	1kg (2.2 lb) 750 mL
20-01-49	Waste Paints/Adhesives	200	Valve Shop	0 kg (0 lb) 0 gal
20-02-24	Waste Paints/Adhesives	203	Metallurgy Lab	0 kg (0 lb) 0 gal
20-04-84	Orbital Maneuvering Subsystems-Engine (OMS-E) Off Spec Product	203	Metallurgy Lab	0 kg (0 lb) 0 gal
35-01-32	Spent and Off-Spec Primer	200	Propulsion Test (Components Test)	0 kg (0 lb) 0 gal
35-01-34	Spent OMS-E Primer/Adhesive	200	Propulsion Test (Components Test)	0 kg (0 lb) 0 gal
35-01-36	Two Part Epoxy Based Ink	200	Propulsion Test (Components Test)	0 kg (0 lb) 0 gal
CONTAMINATED OILS - VACUUM PUMP, REFRIGERATION, SLUDGE, AND MACHINE SHOP, (F001, F002, F003, F005, D002, D004, D005, D006, D007, D008, D009, D018, D035) INCINERATED OFF-SITE BY CLEAN HARBORS, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped (326 kg (717 lbs) of Contaminated Soil, Sludge, and Spill Dry with Oil/Diesel in FY 2011				
10-01-13	Contaminated Spill Dry	156	Heavy Equipment	150 kg (330 lbs)
10-01-16	Blast Media	156	Heavy Equipment	0 kg (0 lb)
10-02-13	Spent Oil/Coolant	113	Machine Shop	0 kg (0 lb) 0 gal
10-02-14	Contaminated Spill Dry	113	Machine Shop	10 kg (23 lb)
10-06-11	Contaminated Spill Dry	200	Mechanical Room	0 kg (0 lb)
10-10-09	Contaminated Spill Dry	151	General Services Administration (GSA) Garage	17 kg (37 lb)
10-20-33	Decontamination Tank Sludge	637	Environmental Department	0 kg (0 lb)
10-20-35	Well Development Sediment	Wells	Environmental Department	0 kg (0 lb) 0 gal

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
10201083	Contaminated Soil	200	Communications	22 kg (48 lb)
102010102	Contaminated Soil	156	Heavy Equipment	30 kg (67 lb)
10201148	Contaminated Soil	200	ETU	22 kg (47 lb)
10201189	Contaminated Soil	156	Heavy Equipment	48 kg (106 lb)
20-01-42	Blast Media	200	Component Services Section (CSS)	22 kg (47 lb)
20-02-39	Spent Cutting Fluid	203	Metallurgy Lab	5 kg (11 lb) 1 gal
20-02-40	Waste Cutting Oil	203	Metallurgy Lab	0 kg (0 lb) 0 gal
20-04-38	Contaminated Hydrocarbon Oil/Sludge	200	Chemistry Lab	0 kg (0 lb) 0 gal
20-06-07	Contaminated Vacuum Pump Oil	200	Valve Shop	0 kg (0 lb) 0 gal
40-02-25	Contaminated Spill Dry	400	Propulsion Test (Steam)	0 kg (0 lb)
CONTAMINATED (FUEL) MATERIALS (P068, U098, U099, U133) INCINERATED OFF-SITE BY CLEAN HARBORS STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 555 kg (1,221 lbs) of hydrazine(s) contaminated debris/materials in FY 2011				
20-01-25	Fuel Contaminated Debris	200	Clean Room	5 kg (10 lb)
20-04-18	Fuel Contaminated Debris	200	Chemistry Lab	45 kg (100 lb)
20-04-31	Fuel Contaminated Material	200	Chemistry Lab	1 kg (2 lb)
20-20-05	Hazardous Debris	200	Environmental Department	23 kg (50 lb)
30-01-08	Fuel Contaminated Soft Goods	301	Propulsion Test (300 Area)	1 kg (2 lb)
30-01-45	Fuel Contaminated Desiccant Tubes	300	Propulsion Test (300 Area)	18 kg (40 lb)
40-01-08	Fuel Contaminated Debris	412	Propulsion Test (400 Area)	25 kg (35 lb)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
50-20-01	Fuel Contaminated Debris	500	Fuel Treatment Unit	9 kg (20 lb)
50-20-04	Granular Activated Carbon (GAC) with Hydrazine	500	Fuel Treatment Unit	364 kg (800 lb)
80-02-09	Fuel Contaminated Debris	800	Hazardous Fluids Test	8 kg (17 lb)
CONTAMINATED (OXIDIZER) MATERIALS (P078, ORIGINALLY BUT HAVE BEEN ADGASSED, F001, F002, P068, U098, U133) INCINERATED OFF-SITE BY CLEAN HARBORS STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 64 kg (141 lbs) of oxidizer contaminated soft goods in FY 2011				
20-01-24	Oxidizer Contaminated Debris	200	Clean Room	5 kg (10 lb)
20-04-16	Oxidizer Contaminated Debris	200	Chemistry Lab	34 kg (75 lb)
20-20-05	Evaporation Tank Debris	200	Environmental Department	1 kg (2 lb)
30-01-18	Oxidizer Contaminated Mole Sieve Pellets	401	Propulsion Test (300 Area)	5 kg (10 lb)
30-01-30	Oxidizer Contaminated Soft Goods	301	Propulsion Test (300 Area)	2 kg (5 lb)
30-01-34	Oxidizer Contaminated Desiccant Tubes	301/328	Propulsion Test (300 Area)	5 kg (10 lb)
40-01-28	Oxidizer Contaminated Debris	412	Propulsion Test (400 Area)	5 kg (10 lb)
80-02-08	Oxidizer Contaminated Soft Goods	800	Hazardous Fluids Test	7 kg (15 lb)
CONTAMINATED DEBRIS (F001, F002, F003, F004, F005, D004, D005, D006, D007, D008, D011, D018, D022, D035, D040) INCINERATED OFF-SITE BY CLEAN HARBORS, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 1,880 kg (4,136 lb) of Contaminated Debris in FY 2011				
10-01-18	Contaminated Rags (Debris)	156	Facilities Heavy Equipment	277 kg (609 lb)
10-01-22	Spent Fuel Filters	159	Facilities Heavy Equipment	32 kg (70 lb)
10-01-23	Contaminated Debris	100	Facilities Maintenance	45 kg (100 lb)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
10-02-09	Contaminated Debris	113	Facilities Machine Shop	356 kg (783 lb)
10-03-03	Spent Paint Booth Filters	158	Paint Shop	0 kg (0 lb)
10-03-04	Contaminated Debris (Rags)	158	Paint Shop	64 kg (141 lb)
10-03-07	Contaminated Debris (brushes/rollers)	158	Paint Shop	213 kg (469 lb)
10-04-14	Contaminated Rags (Debris)	121	Facilities Maintenance	37 kg (82 lb)
10-04-17	Contaminated Rags (Debris)	119	Radio Communications	0 kg (0 lb)
10-06-12	Contaminated Refuse	121	Mechanical Room	0 kg (0 lb)
10-10-11	Contaminated Debris (Oily Rags)	151	GSA Garage	34 kg (75 lb)
10-10-12	Solvent Contaminated Rags	151	GSA Garage	5 kg (11 lb)
10-10-16	Spent Fuel Filters	151	GSA Garage	0 kg (0 lb)
10-12-03	Lead Contaminated Debris	161	Firing Range	0 kg (0 lb)
10-20-01	Contaminated Refuse	161	90-day Area (Environmental)	0 kg (0 lb)
10-20-18	Contaminated Debris	650	Plume Front Treatment Bldg. (Environmental)	41 kg (90 lb)
10-20-34	Contaminated Debris	650	IDW Contaminated Debris (Environmental)	47 kg (103 lb)
10201017	Lead Contaminated Debris	100	Communications	14 kg (31 lb)
20-01-33	Contaminated Refuse	200	Clean Room	14 kg (31 lb)
20-01-60	Contaminated Debris/Filter Cartridges	200	Clean Room	70 kg (154 lb)
20-02-22	Contaminated Debris	203	Metallurgy Lab	23 kg (50 lb)
20-02-41	Lead Contaminated Debris	203	Metallurgy Lab	7 kg (15 lb)
20-02-42	Metallographic Consumables	203	Metallurgy Lab	11 kg (25 lb)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
20-04-31	Waste Firebrick Material	200	Chemistry Lab	3 kg (6.6 lb)
20-04-40	Contaminated Refuse	200	Chemistry Lab	57 kg (125 lb)
20-04-71	Alodine 600 Contaminated Debris	200	Chemistry Lab	0 kg (0 lb)
20-04-83	OMS-E Valve Assembly Waste (Solid)	200	Chemistry Lab	0 kg (0 lb)
20-04-89	Thruster Nozzle Coatings	200	Chemistry Lab	0 kg (0 lb)
20-06-09	Contaminated Debris	203	Chamber Lab	0 kg (0 lb)
20-07-06	Contaminated Debris/Rags	200	Valve Shop	14 kg (30 lb)
27-01-23	Contaminated Debris	272	Hypervelocity	121 kg (268 lb)
30-02-22	Contaminated Rags/Wipes	320	Propulsion Test (300 Area)	0 kg (0 lb)
35-01-39	Contaminated Debris	200	Component Test Facility	0 kg (0 lb)
40-01-70	Contaminated Debris	460	Propulsion Test (400 Area)	0 kg (0 lb)
40-01-74	Contaminated Debris	460	Propulsion Test (Maintenance)	0 kg (0 lb)
40-02-26	Contaminated Debris	400	Propulsion Test (Steam)	0 kg (0 lb)
60-04-07	MPITS IDW Contaminated Filters	600	Mid Plume	89 kg (196 lb)
80-02-39	Contaminated Debris	800	Hazardous Fluids Test	0 kg (0 lb)
80-02-74	Oily Contaminated Rags and Spill Dry	802	Hazardous Pressure Test Area (Shop)	14 kg (26 lb)
80-04-09	Contaminated Debris	803	Prep Lab	34 kg (75 lb)
<p align="center">ORGANIC SOLVENTS, CLEANERS, THINNERS (D001, D006, D008, D018, D035, D039, D040, F001, F002 F003, F004, F005) INCINERATED OFF SITE BY CLEAN HARBORS</p> <p>STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 747 kg (1,643 L lbs), 197 gallons of Organic Solvents in</p>				

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
FY 2011				
10-01-04	Used Antifreeze and Water	156	Heavy Equipment	232 kg (510 lb) 56 gal
10-01-05	Spent Solvents	156	Heavy Equipment	75 kg (166 lb) 20 gal
10-01-07	Waste Fuels (Gasoline/Diesel)	156	Heavy Equipment	236 kg (521 lb) 71 gal
10-01-08	Carburetor Cleaner	156	Heavy Equipment	0 kg (0 lb) 0 gal
10-01-21	Spent Parts Cleaner	156	Heavy Equipment	0 kg (0 lb) 0 gal
10-20-33	Decontamination Tank Sludge	600	Building 637 (Environmental)	0 kg (0 lb) 0 gal
20-01-05	Spent Isopropyl Alcohol (IPA)	200	Clean Room	166 kg (366 lb) 44 gal
20-01-40	Pre-Clean Acetone	200	Clean Room	23 kg (51 lb) 1 gal
20-01-65	Spent IPA/HFE7100	200	Clean Room	0 kg (0 lb) 0 gal
20-02-05	Waste Organic Solvents	203	Metallurgy Lab	0 kg (0 lb) 0 gal
20-02-45	Waste Epoxy Slurry	203	Metallurgy Lab	2 kg (4 lb) 0.25 gal
20-04-04	Waste Organic Liquids	200	Chemistry Lab	(5 kg (11 lb) 3.0 gal
20-04-32	Volatile condensable Material (VCM) Organic Waste	200	Chemistry Lab	1 kg (2.2 lb) 0.1 gal
20-04-33	Coulometric Titration Waste	200	Chemistry Lab	1 kg (2.2 lb) 0.1 gal
20-04-53	Toluene/IPA	200	Chemistry Lab	1 kg (2.2 lb) 0.4 gal
20-04-55	Benzene/Aniline Analysis Waste	200	Chemistry Lab	0 kg (0 lb) 0 gal
20-04-72	Dimethyl-2-Azidoethylamine	200	Chemistry Lab	0 kg (0 lb) 0 gal
20-04-100	E-85 Fuel Analysis Waste	200	Chemistry Lab	1 kg (2.2 lb) 0.4 gal
20-04-105	Organic Waste Water	200	Chemistry Lab	0 kg (0 lb) 0 gal

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
20-08-03	Unused Test Samples	200	Materials Prep	0 kg (0 lb) 0 gal
20-08-04	Methyl Isobutyl Ketone	200	Prep Lab	1 kg (2.2 lb) 0.4 gal
30-01-27	Waste Kerosene	300	Propulsion Test (300 Area)	0 kg (0 lb) 0 gal
30-02-18	Waste Lexsol	300	Propulsion Test (Test Stand 303)	1 kg (2.2 lb) 0.2 gal
35-01-05	Spent IPA (Liquid)	200	Propulsion Test (Component Test)	1 kg (2.2 lb) 0.3 gal
35-01-32	Spent and Off-spec Primer 2001	200	Propulsion Test (Component Test)	0 kg (0 lb) 0 gal
40-01-33	Waste Kerosene	401	Propulsion Test (400 Area)	0 kg (0 lb) 0 gal
40-01-55	Spent Parts Cleaner	460	Propulsion Test (Building 460)	0 kg (0 lb) 0 gal
40-02-04	Spent Parts Cleaner	400	Propulsion Test (Steam)	0 kg (0 lb) 0 gal
40-02-08	Waste IPA	400	Propulsion Test (Steam)	0 kg (0 lb) 0 gal
40-02-10	Waste Diesel	400	Propulsion Test (Steam)	0 kg (0 lb) 0 gal
80-04-03	Waste Organic Standards	800	Materials Test	1 kg (2.2 lb) 0.3 gal
WASTE FUEL (P068, U098, U133) INCINERATED OFF-SITE BY CLEAN HARBORS, STORED IN FUEL TREATMENT UNIT AT <10% – WSTF shipped 48,770 kg (107,294 lb), 12,843 gallons of water with hydrazines from the FTU in FY 2011				
20-04-61	Waste Fuel (Hoke Bottles)	200	Chemistry Lab	0 kg (0 lb) 0 gal
30-01-01	Fuel Contaminated Decon Water	300	Propulsion Test (300 Area)	0 kg (0 lb) 0 gal
30-01-03	Fuel Aspirator Water	300	Propulsion Test (300 Area)	0 kg (0 lb) 0 gal
30-01-35	Total Encapsulating Suit (TES) Decon Rinse Water with Fuel	300	Propulsion Test (300 Area)	0 kg (0 lb) 0 gal

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
30-02-01	Hydrazine Contaminated Decon Water	300	Propulsion Test (302/3 Test Area)	0 kg (0 lb) 0 gal
40-01-01	Fuel Contaminated Decon Water	400	Propulsion Test (400 Area)	0 kg (0 lb) 0 gal
40-01-03	Fuel Aspirator Water	400	Propulsion Test (400 Area)	0 kg (0 lb) 0 gal
40-01-46	TES Decon Rinse Water with Fuel	400	Propulsion Test (400 Area)	0 kg (0 lb) 0 gal
40-01-62	Minuteman Decon Water	400	Propulsion Test (400 Area)	0 kg (0 lb) 0 gal
20201101	Water with <2% Hydrazine	500	Fuel Treatment Unit (FTU)	12,255 kg (26,961 lb) 3,234 gal
20201102	Water with <2% Hydrazine	500	Fuel Treatment Unit (FTU)	13,645 kg (39,817 lb) 3,573 gal
20201103	Water with <2% Hydrazine	500	Fuel Treatment Unit (FTU)	11,110 kg (24,520 lb) 2,929 gal
20201104	Water with <2% Hydrazine	500	Fuel Treatment Unit (FTU)	11,760 kg (25,927 lb) 3,107 gal
80-02-19	Fuel Decon Water	800	Hazardous Fluids Test Area	0 kg (0 lb) 0 gal
80-02-26	Waste Fuel and Water	843	Hazardous Fluids Test Area	0 kg (0 lb) 0 gal
80-02-28	Hydrazine Contaminated Water	844/843	Hazardous Fluids Test Area	0 kg (0 lb) 0 gal
CORROSIVES (D002) INCINERATED OFF-SITE BY CLEAN HARBORS, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 335 kg (737 lb), 111 gallons of Corrosives in FY 2010				
10-02-10	Machine Shop Spent Cleaning Solution	113	Machine Shop	326 kg (717 lb) 110 gal
20-01-41	Waste Acid Matrix	200	Clean Room	0 kg (0 lb) 0 gal
20-01-57	Waste Passivation Solution	200	Clean Room	9 kg (19 lb) 1.0 gal
20-02-32	Spent Organic Etchants	203	Metallurgy Lab	0 kg (0 lb) 0 gal
20-04-103	Waste Organic Acids	200	Clean Room	0 kg (0 lb) 0 gal
20-04-104	Waste Organic Bases	200	Chemistry Lab	0 kg (0 lb) 0 gal

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
30-02-10	Waste Boiler Water Test Kit	300	Water Treatment Building	0 kg (0 lb) 0 gal
METAL BEARING WASTES (D002, D004, D005, D006, D007, D008, D009, D010, D011) OFF-SITE BY CLEAN HARBORS STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 2,646 kg (5,821 lb) of Metal Bearing Wastes in FY 2011				
10-02-02	Machine Shop Spent Coolant	113	Machine Shop	1,832 kg (4039 lb) 110 gal
10-21- 01/102011108	Lead Contaminated Debris	150	Firing Range	392 kg (862 lb)
20-01-18	Spent Brulin Detergent	200	Clean Room	341 kg (750 lb) 90 gal
20-02-46	Lead/Brass Contaminated Sample Debris	203	Metallurgy Lab	0 kg (0 lb) 0 gal
20-04-99	Waste Metal Solutions	200	Chemistry Lab	0 kg (0 lb) 0 gal
40-01-55	Spent Parts Cleaner	400	400 Steam Pad	81 kg (179 lb) 30 gal

**Table B-3 FY2011 WSTF Hazardous Waste Generation Matrix
On-site Treatment**

CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
INVESTIGATIVE DERIVED WASTE (F001, F002) TREATED IN EVAPORATION TANKS				
10-09-10 ,60-02-04, 10-20-30	Purged Groundwater, Decon Water, and Untreated Remediation Waste with IDW	All Areas	Environmental Department	136,850 gal
INVESTIGATIVE DERIVED WASTE (F001, F002) TREATED IN MID-PLUME INTERCEPTION AND TREATMENT SYSTEM				
60-04-01	Purged Groundwater, Decon Water, and Untreated Remediation waste with IDW	All Areas	Environmental Department	400 gal
CORROSIVES (D002, P078) DILUTED/ADGASSED AND TREATED IN THE EVAPORATION TANKS				
20-02-07	Development/Detergent Wash Water	203	Metallurgy Lab	12 gal
20-02-01	Spent Inorganic Etchants	203	Metallurgy Lab	5 gal
30-01-02	Decon Water w/Oxidizer	301	Propulsion Test (Shuttle)	1,324 gal
80-04-31	Oxidizer Decon Water	800	Hazardous Fluids Test Area	110 gal

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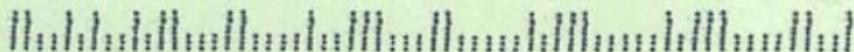


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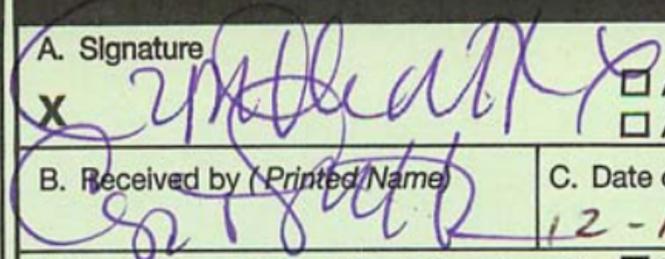
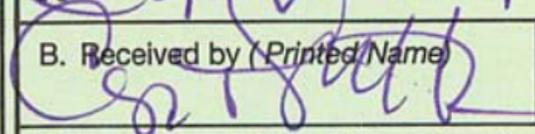
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 Attn: Mr. Dan Comeau
 New Mexico Environmental Department
 2905 Rodeo Park Drive East, Building 1
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