CEI 4/11/96

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WITH SEPERATE ATTACHMENT K

RCRA Inspection Report
U.S. Environmental Protection Agency
Region 9
Hazardous Waste Management Division
Waste Compliance Branch

Purpose:	RCRA Compliance Evaluation Inspection
Facility & Location:	Ames Research Center U.S. National Aeronautics and Space Administration Mail Stop 218-1 Moffett Field, CA 94035-1000
EPA ID Number:	CA1800005034
Date of Inspection:	April 11, 1996
U.S. EPA Inspection Team:	Jean Daniel (415) 744-2128 Env. Specialist, HWMD Molly Measer Env. Scientist, HWMD John Kim Env. Engineer, Air Division
Facility Representatives:	Diane S. Shelander (415) 604-0921 Hazardous Materials Program Manager Sandra Olliges Acting Branch Chief Safety, Health & Env. Services
Photographer:	Molly Measer
Report by:	Jean Daniel

INTRODUCTION

On April 11, 1996, inspectors of U.S. EPA, Region 9, authorized by the Resource Conservation and Recovery Act (RCRA), conducted the first RCRA Comprehensive Evaluation Inspection (CEI) at the U.S. National Aeronautics and Space Administration, Ames Research Center (NASA-ARC). The facility is located at Moffett Field, adjacent to Sunnyvale and Mountain View, in Santa Clara County, California. An area map, a list of buildings, and a partial diagram of the facility are included in this report in Attachment A.

OPERATIONAL BACKGROUND

In 1939 the U.S. National Advisory Committee for Aeronautics (NACA) developed this location for research and aircraft testing. The name of the research facility was changed to NASA-ARC in 1958. In 1993 the adjacent property and buildings of the former Naval Air Station, Moffett Field, were added to NASA-ARC's facility. This complex continues to be devoted to research and development in space science and exploration, as well as energy and aeronautics.

REGULATORY STATUS

The first Notification as a generator of RCRA-regulated hazardous waste was received from NASA-ARC on August 18, 1980. In 1993, when the property of Naval Air Station, Moffett Field, was acquired, the Notification was revised to report the new boundaries. See Attachment B for copies of Notifications and relevant correspondence.

NASA-ARC is a Large Quantity Generator of RCRA-regulated hazardous wastes. Currently there are 298 buildings and trailers (including aircraft hangars, wind tunnels, and a centrifuge) on the facility's 1500 acres with approximately 330 potential points of hazardous waste generation.

U.S. EPA's Superfund program has been involved in two on-site groundwater remediation projects since 1988. In one project, Superfund and NASA-ARC are working with 20 commercial facilities (located on the adjacent Middlefield, Ellis and Whisman Roads) who have been identified as the generators of groundwater contamination which has plumed under NASA-ARC. The second project teams Superfund with the U.S. Navy as they address a plume formed by the activities of the former Naval Air Station. The current EPA Superfund contact is Michael Gill. The wastes generated by these remediation activities are not co-mingled or manifested with NASA-ARC's hazardous waste accumulations.

A contractor prepared a Listing Site Inspection (LSI) report dated June 15, 1992, for NASA-ARC which summarized previous on-site inspections findings and what hazardous wastes were currently detected at NASA-ARC. Sample results indicated above background levels of PCBs and organochlorine pesticides were present primarily in the area of the stormwater drainage system, lead-based primer coatings were found on some of the buildings, and mercury waste resulted from its use in laboratory equipment in conjunction with research activities (manometers, confined vacuum pumps, thermometers, etc.). Projects to remediate the area of the storm drain channel were completed in 1995. Lead-based primer and steel grit were removed from one of the wind tunnels (Bldg. 221) in 1993. A copy of the LSI report is included in this report as Attachment C.

On July 16, 1993, a focused RCRA investigation was conducted by U.S. EPA, Reg. 9, at the request of the staff of NASA-ARC who were concerned that a section of land could not be developed without going through RCRA closure procedures. The inspectors recommended that samples be taken of the two piles of soil on the land and if the results indicated no RCRA-regulated hazardous wastes were detected there was no need to go through RCRA closure.

ON-SITE OBSERVATIONS, April 11, 1996

Photographs taken during the inspection are including in this report as Attachment D.

INBRIEFING:

During the inbriefing, Trish Morrissey, Environmental Group Leader (Remediation), explained the history and status of U.S. EPA Superfund's groundwater remediation projects. Diane Shelander, the Acting Environmental Program Manager, provided the inspectors with all of the background information in this report and escorted the inspectors throughout the day.

One contractor manages NASA-ARC's hazardous waste program (SAIC, as a subcontractor of Laidlaw) subject to Ms. Shelander's supervision. The facility has two 90-day hazardous waste accumulation yards.

The current tenants at NASA-ARC are the Naval Air Reserve, the California Air National Guard, the Army Reserve, Raytheon (a contractor for the Army), and the Defense Fuel Supply Point (a federal fuel farm). These tenants generate most of the facility's hazardous wastes as they maintain aircraft in three large hangars on the Moffett Field side of the facility. The largest volumes of wastes generated are used oil, spent solvent and brake fluids.

The research and experimental laboratories on the Ames Research Center portion of the facility generate small amounts of a broad range of characteristic and listed hazardous wastes. Low-level mixed wastes are generated on-site and handled by the Radiation Safety Group in Building 19. The program was approved and licensed by the Nuclear Regulatory Agency (NRC) who conducts regular inspections. Each shipment off-site is accompanied by the NRC's required form as well as a manifest which describes the RCRA regulated contaminant of the mixed waste. The mixed wastes are shipped to Quadrex, in Florida, for incineration.

Each hazardous waste generator is required to prepare NASA-ARC's standard waste pick-up form, Form A. The completed form provides all the information necessary to adequately identify the waste in order that it can be appropriately contained, labelled, consolidated, treated and or disposed of according to RCRA regulations. It is the facility's policy to require that this form be submitted 50 days after a container begins to accumulate waste so that plans can be made to remove the waste off-site within 90 days of attaining a full container. Form A accompanies the wastes as it is turned-in by the generator or it is sent to the Environmental staff to request the pick-up service. Computer generated labels are prepared and affixed to the waste containers when received. The pick-up van is equipped to transport containers of different types and sizes. The driver, and a chemist, pick up the wastes from the generators and ensure its proper identification, labelling and handling. Any hazardous waste identification problems are resolved by taking samples and sending them off-site for laboratory analysis.

Ms. Shelander advised there are no import or export activities at NASA-ARC for RCRA-regulated hazardous wastes. The facility has a permit to discharge to a publicly owned treatment works (POTW). A description of the aqueous hazardous waste streams that are treated on-site and discharged is provided in Attachment E.

MAIN ACCUMULATION YARD (BUILDING N265) - Photos #1-15:

The Hazardous Substance Transfer Site is located at Hunsaker and Lynberg Roads. It is a large, covered, fenced-in yard. Large metal safety cabinets, each dedicated to different chemical types, were placed on the perimeter and 55-gallon drums, labpacks and Tri-wall containers were placed in rows. There was sufficient aisle space to inspect the condition of the drums and to respond to emergencies. A large work table held small glass and metal containers. These hazardous wastes were labpacked or consolidated. All of the containers were in good condition, labelled and closed.

Dan Winningham, contractor personnel, is the field manager of NASA-ARC's hazardous waste program. The yard's organization and good housekeeping practices were evident. Emergency response supplies and equipment were available and clearly marked. The inspectors saw supplies of absorbent, 6 fire extinguishers, an air horn alarm, and a water hose. A fire hydrant was available immediately outside of the yard. NASA-ARC has its own Fire Dept. The hazardous waste handlers wore pagers. The eye wash and shower were tested and the water ran clear and with adequate volume.

The inspectors found that the 55-gallon drums had been placed to ensure adequate separation between potentially incompatible substances. All of the drums were labelled. One minor problem with one label was promptly corrected: One drum of oil had the standard hazardous waste label, the computer generated hazardous waste label and the U.S. DOT hazardous waste label on it but the handwritten information had contradictory descriptions of the contents - "Mixed Oil" and "Used Oil". (See Photos #4-6.) The staff checked the computer generated inventory printout and the substance was a mixture of oil and spent solvent waste.

The inspectors were advised that each waste pick-up form is given a unique number so that the waste is tracked from generator to manifesting off-site.

The first row of 55-gallon drums were of used and waste oil. Personnel test each drum of oil received with a Chlor-D-tect kit to ensure that each has been properly identified as used oil (which is recycled) or waste oil (oil mixed with hazardous waste which will be sent to a blender to prepare fuel used for burning). During EPA's inspection, Evergreen personnel arrived and did a composite test of the used oil before vacuuming the contents into a tanker truck. (See Photos #12-15.) The emptied drums are recycled.

The second row contained 55-gallon drums of antifreeze from the Hobby Shop, oil-stained rags from the Machine Shop, and Cooling Tower Sludge with lead contamination. The inspectors were told the rags are handled according to the degree of contamination: lightly stained rags go to an industrial laundry, heavily stained, but not saturated or dripping rags, are sent to a landfill, and rags used with chlorinated solvents are shipped to an incinerator.

A third row of 55-gallon drums and Tri-wall containers held a variety of waste substances:

- Caustics - including Mach 1 corrosive cleaner.
- PCBs - light ballasts.
- Asbestos containing material.

- 6 drums of photoprocessing sludge with a low yield of silver. The sludge is the residue of an on-site treatment process to recover silver allowed under the State's tiered permitting program.
- Fluorescent light bulbs to be recycled.
- Organic solution - consolidated lab solutions going to an organic wastewater treatment facility in San Jose.
- Flammables - primarily JP (aircraft) fuel.
- Paint related materials including varnish

ACCUMULATION YARD at BLDG. 498:

The hazardous waste accumulation yard on the Moffett Field part of the facility is located between aircraft hangars 2 & 3 (Bldgs. 46 & 47). This yard is also managed by Mr. Winningham. This area is composed of a yard enclosed with a metal fence and sub-divided by fences into two large cells at each end and six cells in the center. The military units put wastes they generate into this area at the end of each workday or weekend drill. The inspectors were shown the lockbox system that allows the secure placement of the wastes into the yard when it is not attended. The locked separate cells accumulate spent fuels (JP-5, diesel), oils, solvent thinners, lubricants, oily rags, lithium batteries, battery acid, chromic acid, ethylene glycol, and paint wastes and debris. This yard also accumulates materials that have exceeded shelf life or do not meet military specifications. The inspectors saw propane cylinders being managed as hazardous waste because they were not emptied. One safety storage cabinet, about as large as a railroad car, was used to accumulate the acid wastes. It was opened for the inspectors and found to be almost empty. The containers in this yard were in compliance with RCRA. The personnel and emergency response supplies and equipment required by RCRA were available and in good operating order.

AIRCRAFT HANGAR, Building 211:

Several single engine planes were in the hangar undergoing maintenance and/or repairs but the hangar was remarkably clean. The deck was stain free. (See Photos #16-19.) Two drums were labelled to accumulate hazardous waste absorbent materials (rags). One was empty and the other held only a few lightly stained rags. Material Safety Data Sheets were visibly available as well as all of the RCRA required personnel and emergency response supplies and equipment. The inspectors were advised that the heavy overhaul or paint work is not done at this facility. The plane is sent to a contractor off-site.

RESEARCH LABORATORY, Bldg. 239:

Clarence Low provided answers to the inspectors questions as they investigated the generation and management of hazardous waste in Room 318. The ongoing project was in an area of oceanic research and a by-product was a rinsate containing mercury. Liquid mercury was used because it does not bond with carbon dioxide or nitrogen and can be used to physically move these gases through experimental processes. See the hazardous wastes accumulating in containers placed under the sink in Photos #20 and 21. The mercury in the rinsate was 2%. It is NASA-ARC's conservative policy to handle all such rinsates as a regulated hazardous waste. The laboratory glass is cleaned with a hydrochloric acid rinse or methanol when a degreaser is necessary. The Laboratory was operating in compliance with RCRA regulations.

RECORD REVIEWS

MANIFESTS and LAND BAN NOTIFICATIONS & CERTIFICATIONS:

The hazardous waste manifests are filed in Bldg. 19 in the Facility & Logistics Management area. The inspectors randomly reviewed manifests from March of 1993 through March of 1996.

Facility staff could not provide a copy of a Land Ban Notification for the shipment of a hazardous waste prohibited from land disposal since August 8, 1990. The manifest was #95003941 dated 3/3/95 for the shipment of 220 gallons of hydroquinone which contained silver, waste code D011. This failure to retain a copy of the Notification is a potential violation of 22 CCR 66268.7(a)(6).

REPORTS FOR THE DISCHARGES TO THE POTW: (Attachment E.)

Analytical results for samples taken January 18, 1996, were were submitted to the City of Sunnyvale, Water Pollution Control Plant. There were no violations. Copies of the City's evaluation report and the laboratory reports are in Attachment E.

BIENNIAL REPORT: (See Attachment F.)

A copy of the 1995 Hazardous Waste Report was provided. It was submitted to the California Department of Toxic Substances Control on Feb. 28, 1996.

The highest volumes of hazardous wastes generated in 1995 were: Photo chemicals (silver), oil with solvents >1000ppm from aircraft operations, and lead paint solids.

The on-site treatment units are oil/water separators (2), electrolytic silver recovery units (3), a Calfran unit for evaporative treatment of photoprocessing wastes, and a scrubber for rinsewater by ion exchange.

CONTINGENCY PLAN and SPILL REPORT: (Attachment G)

The Plan dated December 1995 was prepared by a contractor, SAIC. It includes a Notification Decision Tree to be used in the event of a fire. The list of Emergency Coordinators is included and current. A copy is included in this report as Attachment G.

Copies of spill reports were made available to the inspectors. There were nine reports submitted to the Santa Clara Department of Environmental Health in 1995 and 1996. There was no single cause or spill patterns described in the reports.

INSPECTION LOGS for ACCUMULATION YARDS: (Attachment H)

Copies of completed inspection checklists and the revised current form were reviewed and found to be adequate.

PREPAREDNESS & PREVENTION: (Attachment I)

There is an extensive program in place to remain prepared to respond to emergencies. As one example of the written guidance documents, a copy of the "Building Emergency Action Plan" for the Accumulation Yard in Bldg. 498 is included in this report. It provides an inventory of what waste chemicals could be in yard, in what amounts, hazard class, etc. A diagram is included indicating the placement of emergency response equipment and two evacuation routes.

PERSONNEL TRAINING RECORDS: (Attachment J)

A copy of the Training Requirement Matrix is included in the "Hazardous Waste Operations" plan. Copies of Mr. Winningham's training record and course certificates are also included. The training program adequately meets RCRA requirements.

HAZARDOUS WASTE REDUCTION PLAN (S.B. 14): (Attachment K)

NASA-ARC's staff gave the inspectors a copy of the 1994 Plan. Because of it size, the report is in the RCRA inspection files of Region 9, as a separate attachment to this report.

POTENTIAL VIOLATIONS

LAND DISPOSAL RESTRICTIONS
REQUIRED COMPLIANCE, 22 CCR 66268.7:

"(a)(6) Generators shall retain onsite a copy of all notices, certifications, demonstrations, waste analysis data and other documentation produced pursuant to this section for at least five years from the date that the waste that is subject of such documentation was last sent to onsite or offsite treatment, storage or disposal."

INSPECTORS ON-SITE OBSERVATION:

The inspectors randomly reviewed hazardous waste manifests and found one for the shipment of silver contaminated waste. Such wastes were prohibited from land disposal on August 8, 1990, if the concentration exceeds treatment standards. If the waste required treatment a Notification would have been sent with the waste to the treatment facility. If the waste did not need treatment then a certification of that fact should have been sent with the waste to the ultimate disposer. The facility's staff could not provide the inspectors with a copy of the Notification required by 22 CCR 66268.7 (a)(1) or a certification as required by 22 CCR 66268.7 (a)(2).

POTENTIAL VIOLATIONS:

The facility may have failed to submit in writing the required Notification or Certification. If so this would be a violation of 22 CCR 66268.7(a)(1) or 22 CCR 66268.7(a)(2).

If the facility submitted the required Notification or Certification, it failed to retain a copy in the facility files as is required in 22 CCR 66268.7(a)(6).

LIST OF REPORT ATTACHMENTS

A - A map of the NASA-ARC area relative to Highway 101, Sunnyvale and Mountain View.
- Organization chart for NASA-ARC
- Visitor's instructions sheet with a list of buildings and a diagram of building locations.

B - NASA-ARC letter to EPA dated March 27, 1996, submitting a corrected diagram of the extended facility.
- A revised Notification received 6/30/93 when Naval Air Station, Moffett Field, became part of NASA-ARC.
- First Notification received August 18, 1980

C Listing Site Inspection report for NASA-ARC, June 1992, prepared by Erler & Kalinowski, Inc.

D Photographs taken during CEI of April 11, 1996, by EPA inspector, Molly Measer.

E POTW discharge sampling results for samples taken January 18, 1996.

F Biennial Report for 1995

G Contingency Plan and nine Spill Reports dated in 1995-6.

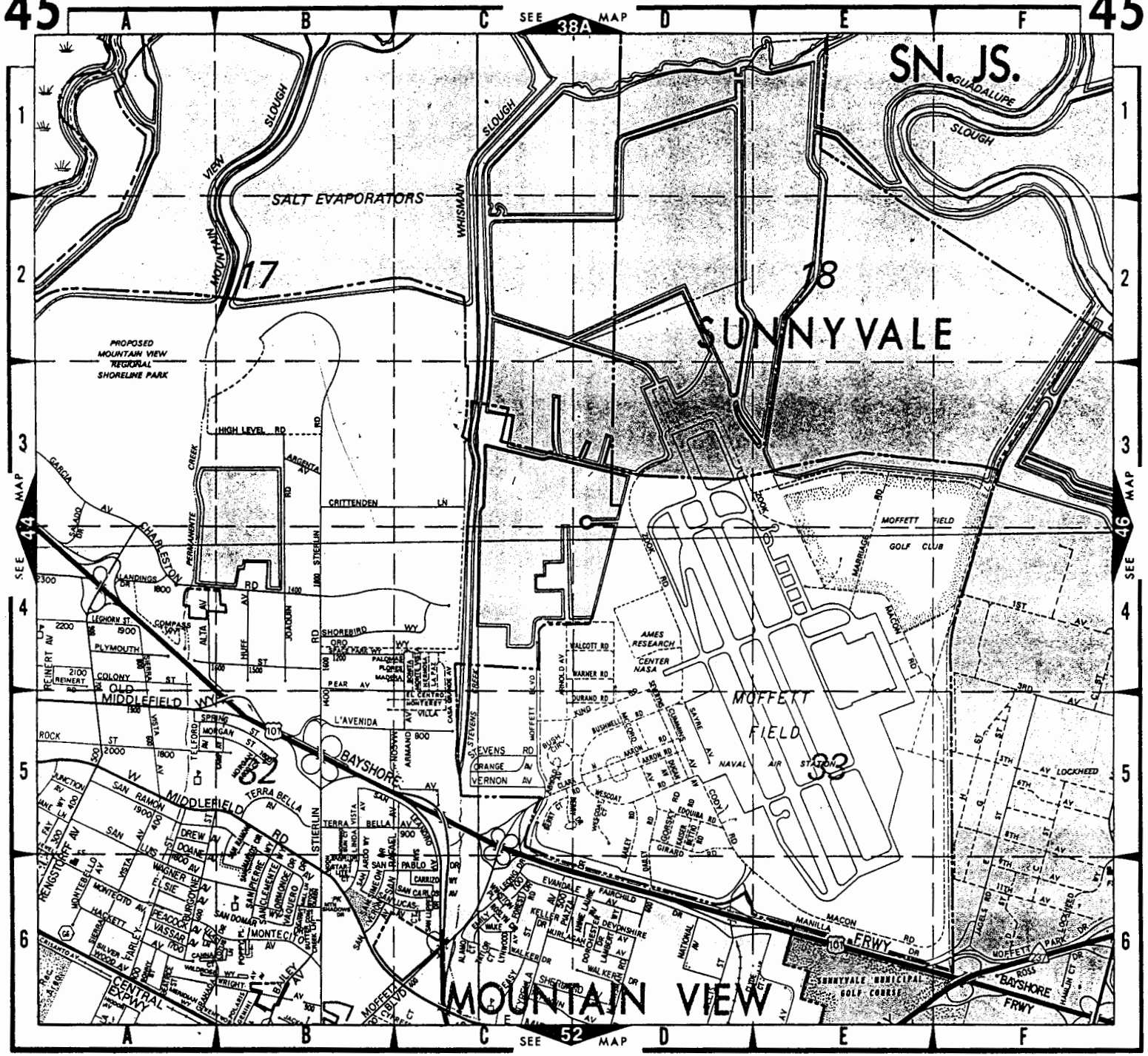
H Accumulation yard inspection report and current checklist

I Building Emergency Action Plan.

J Personnel Training curriculum and training records for Mr. Winningham, accumulation yards supervisor.

K Waste Reduction Plan, S.B. 14, dated 1994, a separate attachment to this report.

A



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STA CLARA

NASA Ames Research Center

Ames Research Center Director Dr. Henry McDonald

Director
Deputy Director
Associate Director for Institutional Management
Assistant Director

Office of the Chief Scientist

Office of the Chief Engineer

Office of the Chief Counsel

Army Aeroflightdynamics Directorate

Advanced Systems Research and Analysis Office

Rotorcraft Technology Planning Activity

Office of the Comptroller

Resources Management Office

Financial Management Division
Cost, Financial Analysis, and Payments Branch
Accounts Resource Control Branch
Financial Systems Service Branch

Safety, Reliability, and Quality Assurance Office
System Safety, Reliability, and Quality Assurance Office
Occupational Safety, Health and Environmental Service Office

OCCUPATIONAL SAFETY INDUSTRIAL HYGIENIST
↑
MIXED WASTE

HEALTH + ENV. OFF.
↑
HW PGM

Flight Operations Office
Airfield Management Office

Commercial Technology Office

External Affairs Office

Equal Opportunity Programs Office

Aeronautics Directorate

Applied Aerodynamics Division
Applied Computational Aerodynamics Branch
High Speed Aerodynamics Branch
Low Speed Aerodynamics Branch
Rotorcraft Aeromechanics Branch

Aeronautical Technologies Division
Advanced Computational Methods Branch
Design Cycle Technologies Branch
Fluid Mechanics Laboratory Branch
Turbulence Physics and Modeling Branch

Flight Management and Human Factors Division
Aviation Safety Reporting System Office
Air Traffic Management Branch
Flight Deck Branch
Human and Systems Technologies Branch
Aviation Operations Branch
Rotorcraft and Powered Lift Branch

Aeronautical Test and Simulation Division
Aeronautical Facilities Engineering Branch
Wind Tunnel Systems Branch
Simulation Operations Branch
Simulation Systems Branch
Wind Tunnel Operations Branch

Aeronautical Projects and Programs Office
Advanced Subsonic Technology Office
High Speed Research Office
ASTOVL/CALF Office
Programs Analysis Office
Advanced Tiltrotor Technology Office
Military Technology Branch
Systems Analysis Branch

Information Systems Directorate

ADP / Information Resources Management Office

Business Systems Office

Computational Sciences Division

Distributed Systems Division
Systems Support Branch
Networks and Communications Branch

Numerical Aerodynamic Simulation Systems Division
Data Analysis Branch
Scientific Computing Branch

Information Systems Programs and Projects Division

Center Operations Directorate

Protective Services Office

Acquisition Division
Purchasing Office
Contract Management Branch for Center Operations
Cntrct Mngmt Br for Information Systems and Aeronautics
Contract Operations Branch
Cntrct Mngmt Br for Space and University Affairs

Systems Engineering Division
Aeroacoustic Project Office
12-Foot Project Office
Unitary Project Office
Mechanical Systems and Materials Engineering Branch
Facilities Engineering Branch
Electronic Systems Branch

Facilities and Logistics Management Division
Moffett Liaison Office
Facilities Planning Office
Plant Engineering Branch
Logistics and Supply Branch

Human Resources Division
Personnel Management Branch
Human Resources Development Branch

Documentation Development Division
Research Information Resources Branch
Reproduction Technology Branch
Documentation Technology Branch

Manufacturing Division
Manufacturing Inspection Office
Model Development and Advanced Composite Branch
Electronic Prototype Development and Calibration Branch
Metals Fabrication Branch
Model Machining and Contract Fabrication Branch

Airborne Science and Flight Research Division
Airborne Astronomy Branch
Engineering Support Branch
Flight Support Branch
MTPE High Altitude Branch
MTPE Medium Altitude Branch
Flight Crew Branch
WATR Branch

Space Directorate

Space Projects Division
Systems Development Branch
Spacecraft Operations Branch
Advanced Projects Branch
Sensors and Instrumentation Branch

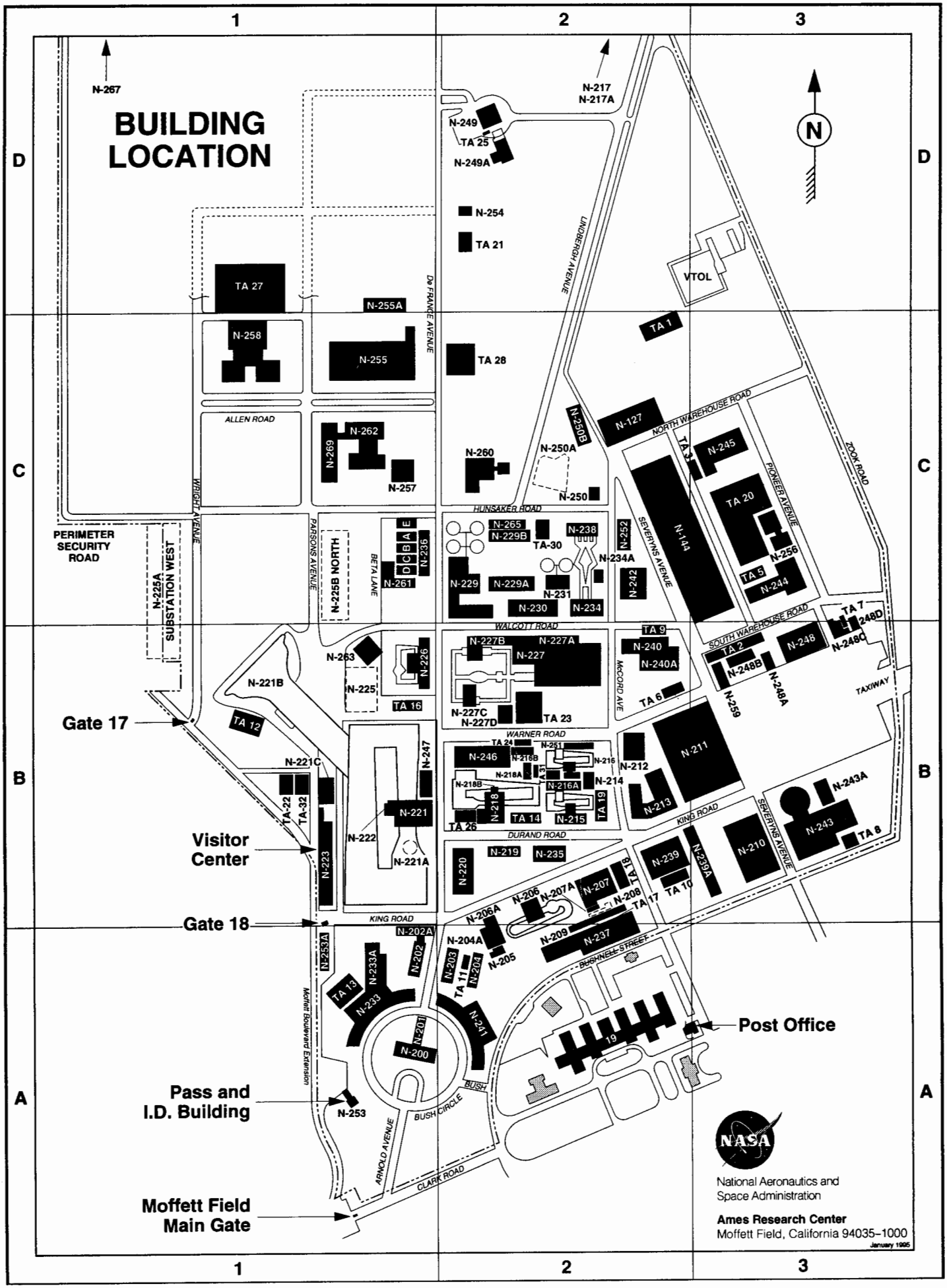
Earth Science Division
Ecosystem Science and Technology Branch
Atmospheric Chemistry and Dynamics Branch
Atmospheric Physics Branch

Life Sciences Division
Payloads and Facilities Engineering Branch
Science Payloads Operations Branch
Gravitational Research Branch

Space Science Division
Astrophysics Branch
Planetary Systems Branch
Exobiology Branch

Space Technology Division
Reacting Flow Environments Branch
Computational Chemistry Branch
Extravehicular and Protective Systems Branch
Thermo-Physics Facilities Branch
Thermal Protection Materials and Systems Branch
Regenerative Life Support Branch

January 1, 1995


BUILDING LOCATION
N-267
N-217
N-217A
N-249
TA 25
N-249A
N-254
TA 21
N
VTOL
TA 27
N-255A
N-258
N-255
DE FRANCE AVENUE
LINDBERGH AVENUE
TA 1
TA 28
ALLEN ROAD
N-262
N-269
N-257
N-260
N-250A
N-250B
N-250
N-127
NORTH WAREHOUSE ROAD
TA 3
N-245
PIONEER AVENUE
ZOOK ROAD
TA 20
N-259
TA 5
N-244
N-144
SEVERYNS AVENUE
N-252
HUNSAKER ROAD
N-265
N-229B
TA-30
N-238
N-234A
N-242
N-229
N-229A
N-231
N-230
N-234
PERIMETER SECURITY ROAD
WRIGHT AVENUE
N-225A
SUBSTATION WEST
PARSONS AVENUE
N-225B NORTH
BETA LANE
N-261
D C B A
N-236
WALCOTT ROAD
N-227B
N-227A
N-227
N-227C
N-227D
TA 23
TA 9
N-240
N-240A
McCORD AVE
TA 6
SOUTH WAREHOUSE ROAD
TA 2
N-248B
N-248
N-248A
N-248C
TA 7
248D
TAXIWAY
N-263
N-226
N-225
TA 16
N-221B
TA 12
Gate 17
WARNER ROAD
TA 24
N-251
N-246
N-218B
N-216
N-218A
N-214
N-216A
N-218
TA 14
N-215
TA 19
TA 26
N-212
N-211
N-213
N-221C
N-247
TA-22
TA-32
N-221
N-222
N-221A
N-223
Visitor Center
DURAND ROAD
N-219
N-235
N-220
KING ROAD
N-239
N-239A
N-210
SEVERYNS AVENUE
N-243A
N-243
TA 8
TA 10
TA 18
N-206
N-207A
N-207
N-208
TA 17
N-206A
N-204A
N-205
N-209
N-237
Gate 18
N-202A
N-202
N-253A
N-233A
N-203
N-204
TA 11
TA 13
N-233
N-201
N-200
N-241
BUSHNELL STREET
Post Office
Moffett Boulevard Extension
Pass and I.D. Building
N-253
BUSH
BUSH CIRCLE
ARNOLD AVENUE
CLARK ROAD
Moffett Field Main Gate
NASA
National Aeronautics and Space Administration
Ames Research Center
Moffett Field, California 94035-1000
January 1995

Visitor Instructions

Please wear your visitor badge in a visible manner on the upper portion of your body.

Place your Temporary Vehicle Permit on the inside of your windshield on the driver's side.

This map has been marked with your destination. Street names and building numbers will aid you.

Please park ONLY in designated spaces and observe red, yellow, white, and other reserved spaces.

Speed limit is 25 mph, unless otherwise posted.

Federal Register under Title 14, Chapter V, Part 1204, Subpart 1204.10 §1204.1003 Procedures.
"Pursuant to NASA regulations, the entrance of individuals to, or their continued presence on, this installation is conditioned upon their consent to inspection of their persons, and of property in their possession or control".

Exit Procedures

Please surrender your badge and holder to the last employee you visit.

Remove and destroy Temporary Vehicle Permit after your last exit.

		Extension
Directory Assistance		
- Business days	7:00 - 5:00	4-6111
24-hour Security Dispatch		
- Emergency services		911
- Non-emergency requests		4-5416
- Lost and found		4-5416
Visitor Center		
- Exhibit hall		
- Business days	9:00 - 4:30	5-6274
- Gift shop and exchange information		
- Business days	8:00 - 4:30	4-5412
Tour Office		
- Business days	9:00 - 4:30	4-6497

Ames-Moffett Legend

Bldg #	Name	Coordinates
N-200	Administration	A1
N-201	Auditorium	A1
N-202	Main Library	A1
N-202A	Computational Fluid Dynamics	A1
N-203	Imaging Technology Branch	A2
N-204	Administrative Support	A2
N-204A	Space Technology	A2
N-205	Pilot Model of 3.5-Foot Hypersonic Wind Tunnel	A2
N-206	12-Foot Pressure Wind Tunnel	B2
N-206A	12-Foot Pressure Wind Tunnel Auxiliaries	B2
N-207	Plant Engineering Services and Technology Laboratory	B2
N-207A	Propulsion Simulator Calibration Laboratory	B2
N-208	Underground Ballistic Range	B2
N-209	Pressurized Ballistic Range	B2
N-210	Flight Systems Research Laboratory	B3
N-211	Flight Support Facility	B3
N-212	Model Development	B2
N-213	Research Support	B2
N-214	Paint Shop	B2
N-215	Army Aeromechanics Lab and 7 -By 10-Foot W.T. #1	B2
N-216	7 -By 10-Foot W.T. #2 (Army Aeromechanics Lab)	B2
N-216A	Model Preparation	B2
N-216B	Army Model Assembly	B2
N-217	Magnetic Standards Laboratory	E1
N-217A	Magnetic Test Facility (20-Foot Coil)	E2
N-218	14-Foot Transonic Wind Tunnel	B2
N-218A	Electrical Equipment	B2
N-218B	Fan Verification	B2
N-219	U.S. Army Aviation Research and Technology	B2
N-220	Technical Services	B2
N-221	40 -By 80-Foot Wind Tunnel	B1
N-221A	20-G Centrifuge	B1
N-221B	80 -By 120-Foot Wind Tunnel	B1
N-221C	Wind Tunnel Substation	B1
N-222	2 -By 2-Foot Transonic Wind Tunnel	B1
N-223	Visitor Center	B1
N-225	Substation	B1
N-225A	Substation West	B1
N-225B	Substation North	B1
N-226	6 -By 6-Foot Supersonic Wind Tunnel	B1
N-227	Unitary Plan Wind Tunnel	B2
N-227A	11-Foot Transonic Wind Tunnel	B2
N-227B	9 -By 7-Foot Supersonic Wind Tunnel	B2
N-227C	8 -By 7-Foot Supersonic Wind Tunnel	B2
N-227D	Unitary Plan Wind Tunnel Auxiliaries	B2
N-229	Experimental Fluid Dynamics Facility (3.5-Foot H.W.T.)	C2
N-229A	3.5-Foot Hypersonic Wind Tunnel Auxiliaries	C2
N-229B	3.5-Foot Hypersonic Wind Tunnel Model Storage	C2
N-230	Physical Sciences Research Laboratory	C2
N-231	Fluid Dynamics Laboratory	C2
N-233	Central Computer Facility	A1
N-233A	Advanced Computational Facility	A1
N-234	Thermal Protection Laboratory	C2
N-234A	Thermal Protection Laboratory Boiler	C2
N-235	Cafeteria	B2
N-236	Bioscience Laboratory	C1
N-236A	Bioscience Laboratory	C1
N-236B	Bioscience Laboratory	C1
N-236C	Bioscience Laboratory	C1
N-236D	Bioscience Laboratory	C1
N-236E	Bioscience Laboratory	C1
N-237	Hypervelocity Free-Flight Facility	A2
N-238	Arc Jet Laboratory	C2
N-239	Life Sciences Research Laboratory	B2
N-239A	Life Sciences Research Laboratory High Bay	B3
N-240	Airborne Missions and Applications	B2

Bldg #	Name	Coordinates
N-240A	Life Sciences Flight Experiments	B2
N-241	Administrative Management	A2
N-242	Vestibular Research Facility	C2
N-243	Flight and Guidance Simulation Laboratory	B3
N-243A	Simulation Equipment	B3
N-244	Space Projects Facility	C3
N-245	Space Sciences Research Laboratory	C3
N-246	Model Construction Facility	B2
N-247	40 -By 80-Foot Wind Tunnel Offices	B1
N-248	Aircraft Servicing Facility	B3
N-248A	Ground Support Equipment	B3
N-248B	Ground Support Equipment #2	B3
N-248C	RSRA Calibration Facility	B3
N-248D	Aircraft Equipment Facility	C3
N-249	Static Test Stand	D2
N-249A	Variable Frequency Power Supply	D2
N-250	Compressor	C2
N-250A	High Pressure Air Storage Facility	C2
N-250B	Plant Engineering Storage	C2
N-251	Motor Pool	B2
N-252	Propane Fuel Facility	C2
N-253	Pass and Identification	A1
N-253A	Security Station	A1
N-254	Telecommunications Gateway Facility	D2
N-255	Supply Support Facility	C1
N-256	Moffett Range Systems Facility	C3
N-257	Man-Vehicle Systems Research Facility	C1
N-258	Numerical Aerodynamic Simulation Facility	C1
N-259	Support Facility High Altitude Aircraft	B3
N-260	Fluid Mechanics Laboratory	C2
N-261	Biomedical Research Facility	C1
N-262	Human Performance Research Laboratory	C1
N-263	Digital Communication Systems	B1
N-265	Hazardous Substances Transfer Site	C2
N-269	Automation Sciences Research Facility	C1

Trailer Area	Name	Coordinates
TA 1	Communication and Astrophysical	C2
TA 2	Medium Altitude Missions Branch	B3
TA 3	Reliability & Quality Assurance; Space Projects	C3
TA 4	Flight Support	B3
TA 5	Space Project	C3
TA 6	LSFEP/DEO and HAMB	B2
TA 7	RSRA Facility Trailers	C3
TA 8	VMS/SimulationSupport	B3
TA 9	Life Science Flight Experiment	B2
TA 10	Life Sciences Support	B2
TA 11	Information Systems Support	A2
TA 12	De Anza Program; Rotorcraft Aeromechanical Branch	B1
TA 13	Computation Support	A1
TA 14	Plant Engineering	B2
TA 15	Quality Assurance and Systems Safety	C3
TA 16	40 -By 80-Foot W.T.; Life Science Investigation Support	B1
TA 17	Helicopter Technology Support	B2
TA 18	Programming Technology Support	B2
TA 19	Army Aeromechanics Laboratory	B2
TA 20	Child Care; Trap-SETI; Space Science; Flight Complex	C3
TA 21	Ames Amateur Radio Club	D2
TA 23	Plant Engineering; Foothill and De Anza Programs	B2
TA 24	Plant Engineering Support	B2
TA 25	Information Systems Support - Barnsi	C2
TA 26	Army	B2
TA 27	NAS Applied Research Laboratory	D1
TA 28	Trailer Complex	C2
TA 29	12-Foot Pressure Wind Tunnel Construction Area	B2

B

DQH:19-1 March 27, 1996

Ms. Kathleen Salyer
U.S. Environmental Protection Agency
Mail Stop H-2-1
75 Hawthorn Street
San Francisco, CA 94105-3901

Dear Ms. Salyer:

In a letter dated February 17, 1993, NASA Ames Research Center (ARC) requested from U.S. EPA Region IX approval to use our existing Generator ID number (CA1800005034) for an expanded site. U.S. EPA approved this request in a letter dated September 27, 1993.

As part of the original request, ARC submitted site plans showing existing and future property boundaries. Through an oversight a portion of the property ARC would acquire from the U.S. Navy on July 1, 1994 was not shown.

This letter clarifies the correct property boundaries for ARC and seeks concurrence from U.S. EPA Region IX that any hazardous waste which may be generated from facilities on that portion of the property can be managed as ARC waste under the ARC Generator ID number.

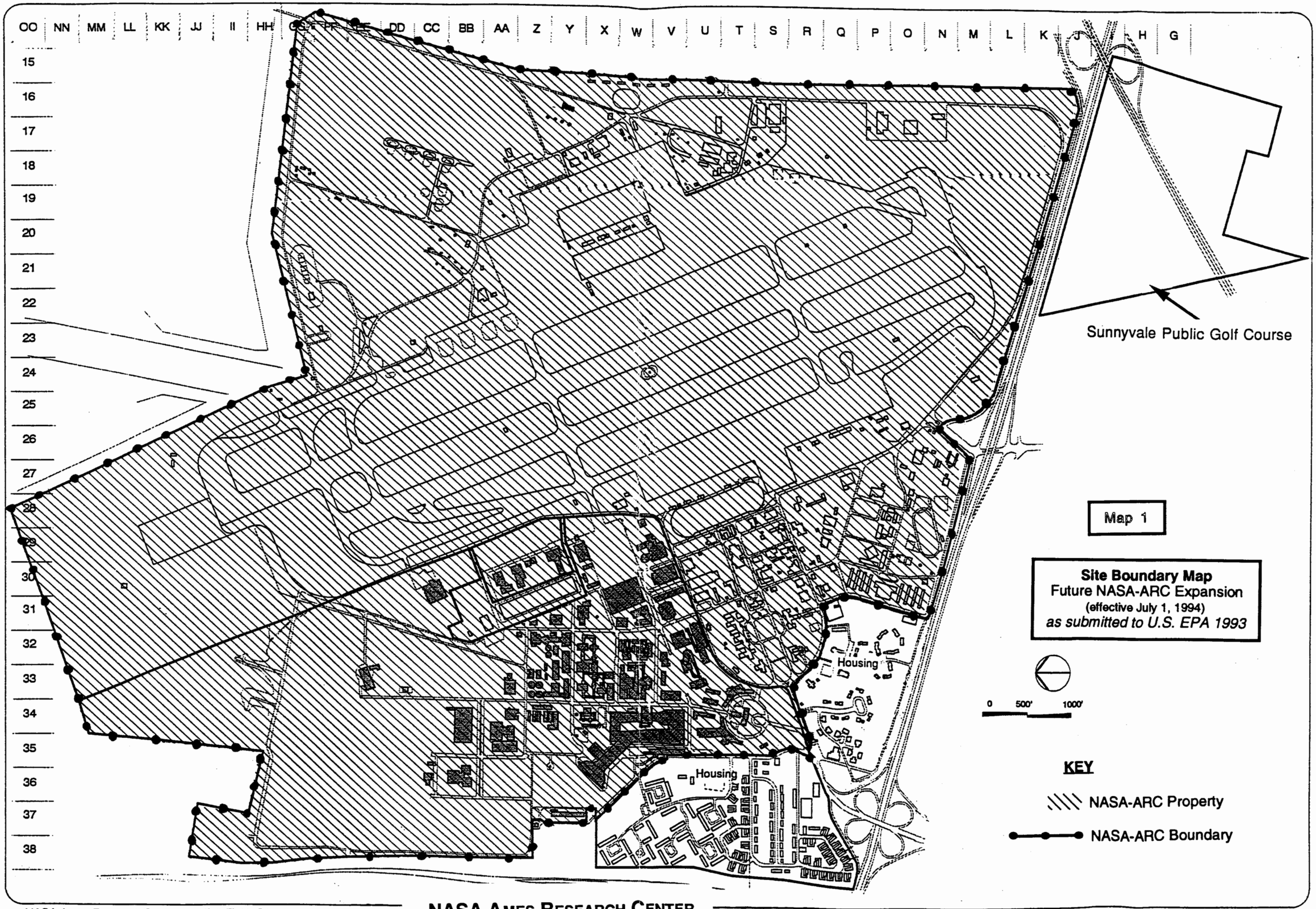
Enclosed are site maps showing the original approved site boundaries and the corrected site boundaries.

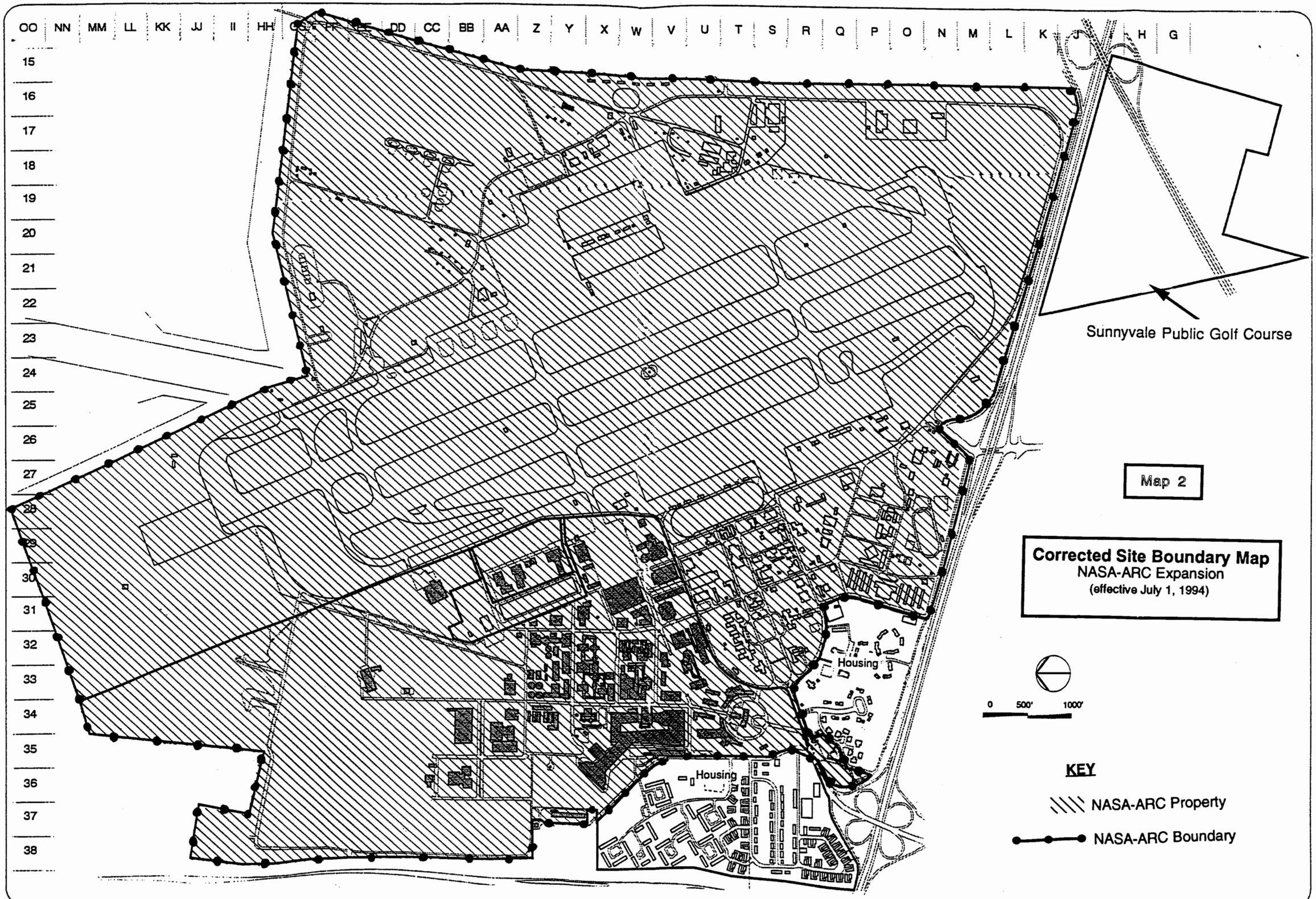
Please feel free to call me at 415-604-0921 if you have any questions or need additional supporting materials.

Sincerely,

Diane Shelander
Environmental Program Manager (Acting)

Enclosures


OO NN MM LL KK JJ II HH GG FF EE DD CC BB AA Z Y X W V U T S R Q P O N M L K J H G
15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38
Sunnyvale Public Golf Course
Housing
Housing
Map 1
Site Boundary Map
Future NASA-ARC Expansion
(effective July 1, 1994)
as submitted to U.S. EPA 1993
0 500' 1000'
KEY
NASA-ARC Property
NASA-ARC Boundary


OO NN MM LL KK JJ II HH GG FF EE DD CC BB AA Z Y X W V U T S R Q P O N M L K J H G
15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38
Sunnyvale Public Golf Course
Map 2
Corrected Site Boundary Map
NASA-ARC Expansion
(effective July 1, 1994)
Housing
Housing
0 500' 1000'
KEY
NASA-ARC Property
NASA-ARC Boundary

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 9-30-92
GSA No. 0246-EPA-OT

Please refer to the *Instructions for Filing Notification* before completing this form. The information requested here is required by law (*Section 3010 of the Resource Conservation and Recovery Act*).

EPA Notification of Regulated Waste Activity

United States Environmental Protection Agency

Date Received (For Official Use Only): 6/30/93

I. Installation's EPA ID Number *(Mark 'X' in the appropriate box)*

[ ] A. First Notification [X] B. Subsequent Notification *(complete item C)*

C. Installation's EPA ID Number: CA1800005034

II. Name of Installation *(Include company and specific site name)*

NASA Ames Research Center

III. Location of Installation *(Physical address not P.O. Box or Route Number)*

Street: Safety office

Street (continued):

City or Town: Moffett Field | State: CA | ZIP Code: 94035-1000

County Code: | County Name: Santa Clara

IV. Installation Mailing Address *(See Instructions)*

Street or P.O. Box: Mail Stop 218-1

City or Town: Moffett Field | State: CA | ZIP Code: 94035-1000

V. Installation Contact *(Person to be contacted regarding waste activities at site)*

Name *(last)*: Olliges | *(first)*: Sandra

Job Title: Asst. Br. Chief | Phone Number *(area code and number)*: 415-604-3355

VI. Installation Contact Address *(See Instructions)*

A. Contact Address: Location [ ] Mailing [X]

B. Street or P.O. Box: Mail Stop 218-1

City or Town: Moffett Field | State: CA | ZIP Code: 94035-1000

VII. Ownership *(See Instructions)*

A. Name of Installation's Legal Owner: United States Government

Street, P.O. Box, or Route Number: NASA Ames Research Center

City or Town: Moffett Field | State: CA | ZIP Code: 94035-1000

Phone Number *(area code and number)*: 415-604-5000

B. Land Type: F

C. Owner Type: F

D. Change of Owner Indicator: Yes [ ] No [X]

(Date Changed) Month Day Year:

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 9-30-92
GSA No. 0246-EPA-OT

ID - For Official Use Only

VIII. Type of Regulated Waste Activity *(Mark 'X' in the appropriate boxes. Refer to instructions.)*

A. Hazardous Waste Activity

1. Generator (See Instructions)
   - [X] a. Greater than 1000kg/mo (2,200 lbs.)
   - [ ] b. 100 to 1000 kg/mo (220 - 2,200 lbs.)
   - [ ] c. Less than 100 kg/mo (220 lbs.)
2. Transporter (Indicate Mode in boxes 1-5 below)
   - [ ] a. For own waste only
   - [ ] b. For commercial purposes

   Mode of Transportation
   - [ ] 1. Air
   - [ ] 2. Rail
   - [ ] 3. Highway
   - [ ] 4. Water
   - [ ] 5. Other - specify
3. [ ] Treater, Storer, Disposer (at installation) Note: A permit is required for this activity; see instructions.
4. Hazardous Waste Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Marketers
   - [ ] c. Boiler and/or Industrial Furnace
     - [ ] 1. Smelter Deferral
     - [ ] 2. Small Quantity Exemption

     Indicate Type of Combustion Device(s)
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
5. [ ] Underground Injection Control

B. Used Oil Fuel Activities

1. Off-Specification Used Oil Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Marketer
   - [ ] c. Burner - indicate device(s) - Type of Combustion Device
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
2. [ ] Specification Used Oil Fuel Marketer (or On-site Burner) Who First Claims the Oil Meets the Specification

IX. Description of Regulated Wastes *(Use additional sheets if necessary)*

A. Characteristics of Nonlisted Hazardous Wastes. Mark 'X' in the boxes corresponding to the characteristics of nonlisted hazardous wastes your installation handles. *(See 40 CFR Parts 261.20 - 261.24)*

1. Ignitable *(D001)*	2. Corrosive *(D002)*	3. Reactive *(D003)*	4. Toxicity Characteristic *(D000)*	(List specific EPA hazardous waste number(s) for the Toxicity characteristic contaminant(s))			
X	X	X	X	D004	D005	D006	D007

B. Listed Hazardous Wastes. (See 40 CFR 261.31 - 33. See instructions if you need to list more than 12 waste codes.)

1	2	3	4	5	6
F001	F002	F003	F004	F005	F006
7	**8**	**9**	**10**	**11**	**12**
F019	F027	P001	P002	P003	P004

C. Other Wastes. (State or other wastes requiring a handler to have an I.D. number. See instructions.)

1	2	3	4	5	6
0121	0122	0123	0131	0132	0133

X. Certification

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

Signature	Name and Official Title *(type or print)*	Date Signed
Sandra M. Olliges	Sandra M. Olliges, Assistant Chief PQH	6-22-93

XI. Comments

Please refer to attached maps and letter for site information. For IX (A), (B), (C) see attached lists for additional waste codes.

Note: Mail completed form to the appropriate EPA Regional or State Office. (See Section III of the booklet for addresses.)

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 9-30-92
GSA No. 0246-EPA-OT

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IX. Description of Regulated Wastes Continued *(Additional sheet)*

B. Listed Hazardous Wastes. (See 40 CFR 261.31 - 33. Use this page only if you need to list more than 12 waste codes.)

13	14	15	16	17	18
P005	P006	P007	P008	P009	P010
19	20	21	22	23	24
P011	P012	P013	P014	P015	P016
25	26	27	28	29	30
P017	P018	P019	P020	P021	P022
31	32	33	34	35	36
P023	P024	P025	P026	P027	P028
37	38	39	40	41	42
P029	P030	P031	P032	P033	P034
43	44	45	46	47	48
P035	P036	P037	P038	P039	P040
49	50	51	52	53	54
P041	P042	P043	P044	P045	P046
55	56	57	58	59	60
P047	P048	P049	P050	P051	P052
61	62	63	64	65	66
P053	P054	P055	P056	P057	P058
67	68	69	70	71	72
P059	P060	P061	P062	P063	P064
73	74	75	76	77	78
P065	P066	P067	P068	P069	P070
79	80	81	82	83	84
P071	P072	P073	P074	P075	P076
85	86	87	88	89	90
P077	P078	P079	P080	P081	P082
91	92	93	94	95	96
P083	P084	P085	P086	P087	P088
97	98	99	100	101	102
P089	P090	P091	P092	P093	P094
103	104	105	106	107	108
P095	P096	P097	P098	P099	P100
109	110	111	112	113	114
P101	P102	P103	P104	P105	P106
115	116	117	118	119	120
P107	P108	P109	P110	P111	P112

ADDITIONAL HAZARDOUS WASTE CODES

IX A. Additional toxicity characteristic wastes (40 CFR 261.24)

D008	D009	D010	D011	D012	D013
D014	D015	D016	D017	D018	D019
D020	D021	D022	D023	D024	D025
D026	D027	D028	D029	D030	D031
D032	D033	D034	D035	D036	D037
D038	D039	D040	D041	D042	D043

IX C. Additional California hazardous waste codes

0134	0135	0141	0151	0162	0171
0172	0181	0211	0212	0213	0214
0221	0222	0223	0231	0241	0261
0271	0272	0281	0291	0321	0322
0331	0341	0342	0343	0351	0352
0411	0421	0451	0461	0471	0491
0511	0512	0513	0521	0531	0541
0551	0561	0571	0581	0591	0611
0711	0721	0722	0723	0724	0725
0726	0727	0728	0731	0741	0751
0791	0792	0801			

IX B. Additional listed wastes (40 CFR 216.33 (e) and (f))
40 CFR 216.33 (e):

P111	P112	P113	P114	P115	P116
P117	P118	P119	P120	P121	P122
P123					

All listed wastes under 40 CFR 261.33 (f), as shown below and on the following 7 pages.

Hazardous waste No.	Chemical abstracts No.	Substance
U001	75-07-0	Acetaldehyde (I)
U034	75-87-6	Acetaldehyde, trichloro-
U187	62-44-2	Acetamide, N-(4-ethoxyphenyl)-
U005	53-96-3	Acetamide, N-9H-fluoren-2-yl-
U240	94-75-7	Acetic acid, (2,4-dichlorophenoxy)-, salts & esters
U112	141-78-6	Acetic acid ethyl ester (I)
U144	301-04-2	Acetic acid, lead(2+) salt
U214	563-68-8	Acetic acid, thallium(1+) salt
see F027	93-76-5	Acetic acid, (2,4,5-trichlorophenoxy)-
U002	67-64-1	Acetone (I)
U003	75-05-8	Acetonitrile (I,T)
U004	98-86-2	Acetophenone
U005	53-96-3	2-Acetylaminofluorene
U006	75-36-5	Acetyl chloride (C,R,T)
U007	79-06-1	Acrylamide
U008	79-10-7	Acrylic acid (I)
U009	107-13-1	Acrylonitrile
U011	61-82-5	Amitrole
U012	62-53-3	Aniline (I,T)
U136	75-60-5	Arsinic acid, dimethyl-
U014	492-80-8	Auramine

Hazardous waste No.	Chemical abstracts No.	Substance
U015	115-02-6	Azaserine
U010	50-07-7	Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1aalpha, 8beta,8aalpha,8balpha)]-
U157	56-49-5	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-
U016	225-51-4	Benz[c]acridine
U017	98-87-3	Benzal chloride
U192	23950-58-5	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-
U018	56-55-3	Benz[a]anthracene
U094	57-97-6	Benz[a]anthracene, 7,12-dimethyl-
U012	62-53-3	Benzenamine (I,T)
U014	492-80-8	Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-
U049	3165-93-3	Benzenamine, 4-chloro-2-methyl-, hydrochloride
U093	60-11-7	Benzenamine, N,N-dimethyl-4-(phenylazo)-
U328	95-53-4	Benzenamine, 2-methyl-
U353	106-49-0	Benzenamine, 4-methyl-
U158	101-14-4	Benzenamine, 4,4'-methylenebis[2-chloro-
U222	636-21-5	Benzenamine, 2-methyl-, hydrochloride
U181	99-55-8	Benzenamine, 2-methyl-5-nitro-
U019	71-43-2	Benzene (I,T)
U038	510-15-6	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester
U030	101-55-3	Benzene, 1-bromo-4-phenoxy-
U035	305-03-3	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-
U037	108-90-7	Benzene, chloro-
U221	25376-45-8	Benzenediamine, ar-methyl-
U028	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester
U069	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester
U088	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester
U102	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester
U107	117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester
U070	95-50-1	Benzene, 1,2-dichloro-
U071	541-73-1	Benzene, 1,3-dichloro-
U072	106-46-7	Benzene, 1,4-dichloro-
U060	72-54-8	Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-
U017	98-87-3	Benzene, (dichloromethyl)-
U223	26471-62-5	Benzene, 1,3-diisocyanatomethyl- (R,T)
U239	1330-20-7	Benzene, dimethyl- (I,T)
U201	108-46-3	1,3-Benzenediol
U127	118-74-1	Benzene, hexachloro-
U056	110-82-7	Benzene, hexahydro- (I)
U220	108-88-3	Benzene, methyl-
U105	121-14-2	Benzene, 1-methyl-2,4-dinitro-
U106	606-20-2	Benzene, 2-methyl-1,3-dinitro-
U055	98-82-8	Benzene, (1-methylethyl)- (I)
U169	98-95-3	Benzene, nitro-
U183	608-93-5	Benzene, pentachloro-
U185	82-68-8	Benzene, pentachloronitro-
U020	98-09-9	Benzenesulfonic acid chloride (C,R)
U020	98-09-9	Benzenesulfonyl chloride (C,R)
U207	95-94-3	Benzene, 1,2,4,5-tetrachloro-
U061	50-29-3	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-
U247	72-43-5	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4- methoxy-
U023	98-07-7	Benzene, (trichloromethyl)-
U234	99-35-4	Benzene, 1,3,5-trinitro-
U021	92-87-5	Benzidine
U202	[1] 81-07-2	1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide, & salts
U203	94-59-7	1,3-Benzodioxole, 5-(2-propenyl)-
U141	120-58-1	1,3-Benzodioxole, 5-(1-propenyl)-
U090	94-58-6	1,3-Benzodioxole, 5-propyl-
U064	189-55-9	Benzo[rst]pentaphene
U248	[1] 81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenyl-butyl)-, & salts, when present at concentrations of 0.3% or less
U022	50-32-8	Benzo[a]pyrene
U197	106-51-4	p-Benzoquinone
U023	98-07-7	Benzotrichloride (C,R,T)
U085	1464-53-5	2,2'-Bioxirane
U021	92-87-5	[1,1'-Biphenyl]-4,4'-diamine
U073	91-94-1	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-
U091	119-90-4	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-
U095	119-93-7	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-
U225	75-25-2	Bromoform

Hazardous waste No.	Chemical abstracts No.	Substance
U030	101-55-3	4-Bromophenyl phenyl ether
U128	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-
U172	924-16-3	1-Butanamine, N-butyl-N-nitroso-
U031	71-36-3	1-Butanol (I)
U159	78-93-3	2-Butanone (I,T)
U160	1338-23-4	2-Butanone, peroxide (R,T)
U053	4170-30-3	2-Butenal
U074	764-41-0	2-Butene, 1,4-dichloro- (I,T)
U143	303-34-4	2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z),7(2S*,3R*),7aalpha]]-
U031	71-36-3	n-Butyl alcohol (I)
U136	75-60-5	Cacodylic acid
U032	13765-19-0	Calcium chromate
U238	51-79-6	Carbamic acid, ethyl ester
U178	615-53-2	Carbamic acid, methylnitroso-, ethyl ester
U097	79-44-7	Carbamic chloride, dimethyl-
U114	[1] 111-54-6	Carbamodithioic acid, 1,2-ethanediylbis-, salts & esters
U062	2303-16-4	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester
U215	6533-73-9	Carbonic acid, dithallium(1+) salt
U033	353-50-4	Carbonic difluoride
U156	79-22-1	Carbonochloridic acid, methyl ester (I,T)
U033	353-50-4	Carbon oxyfluoride (R,T)
U211	56-23-5	Carbon tetrachloride
U034	75-87-6	Chloral
U035	305-03-3	Chlorambucil
U036	57-74-9	Chlordane, alpha & gamma isomers
U026	494-03-1	Chlornaphazin
U037	108-90-7	Chlorobenzene
U038	510-15-6	Chlorobenzilate
U039	59-50-7	p-Chloro-m-cresol
U042	110-75-8	2-Chloroethyl vinyl ether
U044	67-66-3	Chloroform
U046	107-30-2	Chloromethyl methyl ether
U047	91-58-7	beta-Chloronaphthalene
U048	95-57-8	o-Chlorophenol
U049	3165-93-3	4-Chloro-o-toluidine, hydrochloride
U032	13765-19-0	Chromic acid H_2CrO_4, calcium salt
U050	218-01-9	Chrysene
U051	.....	Creosote
U052	1319-77-3	Cresol (Cresylic acid)
U053	4170-30-3	Crotonaldehyde
U055	98-82-8	Cumene (I)
U246	506-68-3	Cyanogen bromide (CN)Br
U197	106-51-4	2,5-Cyclohexadiene-1,4-dione
U056	110-82-7	Cyclohexane (I)
U129	58-89-9	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5alpha,6beta)-
U057	108-94-1	Cyclohexanone (I)
U130	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-
U058	50-18-0	Cyclophosphamide
U240	[1] 94-75-7	2,4-D, salts & esters
U059	20830-81-3	Daunomycin
U060	72-54-8	DDD
U061	50-29-3	DDT
U062	2303-16-4	Diallate
U063	[4] 53-70-3	Dibenz[a,h]anthracene
U064	[4] 189-55-9	Dibenzo[a,i]pyrene
U066	96-12-8	1,2-Dibromo-3-chloropropane
U069	84-74-2	Dibutyl phthalate
U070	95-50-1	o-Dichlorobenzene
U071	541-73-1	m-Dichlorobenzene
U072	106-46-7	p-Dichlorobenzene
U073	91-94-1	3,3'-Dichlorobenzidine
U074	764-41-0	1,4-Dichloro-2-butene (I,T)
U075	75-71-8	Dichlorodifluoromethane
U078	75-35-4	1,1-Dichloroethylene
U079	156-60-5	1,2-Dichloroethylene

Hazardous waste No.	Chemical abstracts No.	Substance
U025	111-44-4	Dichloroethyl ether
U027	108-60-1	Dichloroisopropyl ether
U024	111-91-1	Dichloromethoxy ethane
U081	120-83-2	2,4-Dichlorophenol
U082	87-65-0	2,6-Dichlorophenol
U084	542-75-6	1,3-Dichloropropene
U085	1464-53-5	1,2:3,4-Diepoxybutane (I,T)
U108	123-91-1	1,4-Diethyleneoxide
U028	117-81-7	Diethylhexyl phthalate
U086	1615-80-1	N,N'-Diethylhydrazine
U087	3288-58-2	O,O-Diethyl S-methyl dithiophosphate
U088	84-66-2	Diethyl phthalate
U089	56-53-1	Diethylstilbesterol
U090	94-58-6	Dihydrosafrole
U091	119-90-4	3,3'-Dimethoxybenzidine
U092	124-40-3	Dimethylamine (I)
U093	60-11-7	p-Dimethylaminoazobenzene
U094	57-97-6	7,12-Dimethylbenz[a]anthracene
U095	119-93-7	3,3'-Dimethylbenzidine
U096	80-15-9	alpha,alpha-Dimethylbenzylhydroperoxide (R)
U097	79-44-7	Dimethylcarbamoyl chloride
U098	57-14-7	1,1-Dimethylhydrazine
U099	540-73-8	1,2-Dimethylhydrazine
U101	105-67-9	2,4-Dimethylphenol
U102	131-11-3	Dimethyl phthalate
U103	77-78-1	Dimethyl sulfate
U105	121-14-2	2,4-Dinitrotoluene
U106	606-20-2	2,6-Dinitrotoluene
U107	117-84-0	Di-n-octyl phthalate
U106	123-91-1	1,4-Dioxane
U109	122-66-7	1,2-Diphenylhydrazine
U110	142-84-7	Dipropylamine (I)
U111	621-64-7	Di-n-propylnitrosamine
U041	106-89-8	Epichlorohydrin
U001	75-07-0	Ethanal (I)
U174	55-18-5	Ethanamine, N-ethyl-N-nitroso-
U155	91-80-5	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-
U067	106-93-4	Ethane, 1,2-dibromo-
U076	75-34-3	Ethane, 1,1-dichloro-
U077	107-06-2	Ethane, 1,2-dichloro-
U131	67-72-1	Ethane, hexachloro-
U024	111-91-1	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-
U117	60-29-7	Ethane, 1,1'-oxybis-(I)
U025	111-44-4	Ethane, 1,1'-oxybis[2-chloro-
U184	76-01-7	Ethane, pentachloro-
U208	630-20-6	Ethane, 1,1,1,2-tetrachloro-
U209	79-34-5	Ethane, 1,1,2,2-tetrachloro-
U218	62-55-5	Ethanethioamide
U226	71-55-6	Ethane, 1,1,1-trichloro-
U227	79-00-5	Ethane, 1,1,2-trichloro-
U359	110-80-5	Ethanol, 2-ethoxy-
U173	1116-54-7	Ethanol, 2,2'-(nitrosoimino)bis-
U004	98-86-2	Ethanone, 1-phenyl-
U043	75-01-4	Ethene, chloro-
U042	110-75-8	Ethene, (2-chloroethoxy)-
U078	75-35-4	Ethene, 1,1-dichloro-
U079	156-60-5	Ethene, 1,2-dichloro-, (E)-
U210	127-18-4	Ethene, tetrachloro-
U228	79-01-6	Ethene, trichloro-
U112	141-78-6	Ethyl acetate (I)
U113	140-88-5	Ethyl acrylate (I)
U238	51-79-6	Ethyl carbamate (urethane)
U117	60-29-7	Ethyl ether (I)
U114	111-54-6	Ethylenebisdithiocarbamic acid, salts & esters
U067	106-93-4	Ethylene dibromide
U077	107-06-2	Ethylene dichloride
U359	110-80-5	Ethylene glycol monoethyl ether
U115	75-21-8	Ethylene oxide (I,T)
U116	96-45-7	Ethylenethiourea
U076	75-34-3	Ethylidene dichloride

Hazardous waste No.	Chemical abstracts No.	Substance
U118	97-63-2	Ethyl methacrylate
U119	62-50-0	Ethyl methanesulfonate
U120	206-44-0	Fluoranthene
U122	50-00-0	Formaldehyde
U123	64-18-6	Formic acid (C,T)
U124	110-00-9	Furan (I)
U125	98-01-1	2-Furancarboxaldehyde (I)
U147	108-31-6	2,5-Furandione
U213	109-99-9	Furan, tetrahydro-(I)
U125	98-01-1	Furfural (I)
U124	110-00-9	Furfuran (I)
U206	18883-66-4	Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-, D-
U206	18883-66-4	D-Glucose, 2-deoxy-2-[[(methylnitrosoamino)-carbonyl]amino]-
U126	765-34-4	Glycidylaldehyde
U163	70-25-7	Guanidine, N-methyl-N'-nitro-N-nitroso-
U127	118-74-1	Hexachlorobenzene
U128	87-68-3	Hexachlorobutadiene
U130	77-47-4	Hexachlorocyclopentadiene
U131	67-72-1	Hexachloroethane
U132	70-30-4	Hexachlorophene
U243	1888-71-7	Hexachloropropene
U133	302-01-2	Hydrazine (R,T)
U086	1615-80-1	Hydrazine, 1,2-diethyl-
U098	57-14-7	Hydrazine, 1,1-dimethyl-
U099	540-73-6	Hydrazine, 1,2-dimethyl-
U109	122-66-7	Hydrazine, 1,2-diphenyl-
U134	7664-39-3	Hydrofluoric acid (C,T)
U134	7664-39-3	Hydrogen fluoride (C,T)
U135	7783-06-4	Hydrogen sulfide
U135	7783-06-4	Hydrogen sulfide H_2S
U096	80-15-9	Hydroperoxide, 1-methyl-1-phenylethyl- (R)
U116	96-45-7	2-Imidazolidinethione
U137	193-39-5	Indeno[1,2,3-cd]pyrene
U190	85-44-9	1,3-Isobenzofurandione
U140	78-83-1	Isobutyl alcohol (I,T)
U141	120-58-1	Isosafrole
U142	143-50-0	Kepone
U143	303-34-4	Lasiocarpine
U144	301-04-2	Lead acetate
U146	1335-32-6	Lead, bis(acetato-O)tetrahydroxytri-
U145	7446-27-7	Lead phosphate
U146	1335-32-6	Lead subacetate
U129	58-89-9	Lindane
U163	70-25-7	MNNG
U147	108-31-6	Maleic anhydride
U148	123-33-1	Maleic hydrazide
U149	109-77-3	Malononitrile
U150	148-82-3	Melphalan
U151	7439-97-6	Mercury
U152	126-98-7	Methacrylonitrile (I, T)
U092	124-40-3	Methanamine, N-methyl- (I)
U029	74-83-9	Methane, bromo-
U045	74-87-3	Methane, chloro- (I, T)
U046	107-30-2	Methane, chloromethoxy-
U068	74-95-3	Methane, dibromo-
U080	75-09-2	Methane, dichloro-
U075	75-71-8	Methane, dichlorodifluoro-
U138	74-88-4	Methane, iodo-
U119	62-50-0	Methanesulfonic acid, ethyl ester
U211	56-23-5	Methane, tetrachloro-
U153	74-93-1	Methanethiol (I, T)
U225	75-25-2	Methane, tribromo-
U044	67-66-3	Methane, trichloro-
U121	75-69-4	Methane, trichlorofluoro-
U036	57-74-9	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-
U154	67-56-1	Methanol (I)
U155	91-80-5	Methapyrilene
U142	143-50-0	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-
U247	72-43-5	Methoxychlor

Hazardous waste No.	Chemical abstracts No.	Substance
U154	67-56-1	Methyl alcohol (I)
U029	74-83-9	Methyl bromide
U186	504-60-9	1-Methylbutadiene (I)
U045	74-87-3	Methyl chloride (I,T)
U156	79-22-1	Methyl chlorocarbonate (I,T)
U226	71-55-6	Methyl chloroform
U157	56-49-5	3-Methylcholanthrene
U158	101-14-4	4,4'-Methylenebis(2-chloroaniline)
U068	74-95-3	Methylene bromide
U080	75-09-2	Methylene chloride
U159	78-93-3	Methyl ethyl ketone (MEK) (I,T)
U160	1338-23-4	Methyl ethyl ketone peroxide (R,T)
U138	74-88-4	Methyl iodide
U161	108-10-1	Methyl isobutyl ketone (I)
U162	80-62-6	Methyl methacrylate (I,T)
U161	108-10-1	4-Methyl-2-pentanone (I)
U164	56-04-2	Methylthiouracil
U010	50-07-7	Mitomycin C
U059	20830-81-3	5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl)oxy]-7,6,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-
U167	134-32-7	1-Naphthalenamine
U168	91-59-8	2-Naphthalenamine
U026	494-03-1	Naphthalenamine, N,N'-bis(2-chloroethyl)-
U165	91-20-3	Naphthalene
U047	91-58-7	Naphthalene, 2-chloro-
U166	130-15-4	1,4-Naphthalenedione
U236	72-57-1	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl[1,1'-biphenyl]-4,4'-diyl)bis(azo)bis[5-amino-4-hydroxy]-, tetrasodium salt
U166	130-15-4	1,4-Naphthoquinone
U167	134-32-7	alpha-Naphthylamine
U168	91-59-8	beta-Naphthylamine
U217	10102-45-1	Nitric acid, thallium(1+) salt
U169	98-95-3	Nitrobenzene (I,T)
U170	100-02-7	p-Nitrophenol
U171	79-46-9	2-Nitropropane (I,T)
U172	924-16-3	N-Nitrosodi-n-butylamine
U173	1116-54-7	N-Nitrosodiethanolamine
U174	55-18-5	N-Nitrosodiethylamine
U176	759-73-9	N-Nitroso-N-ethylurea
U177	684-93-5	N-Nitroso-N-methylurea
U178	615-53-2	N-Nitroso-N-methylurethane
U179	100-75-4	N-Nitrosopipendine
U180	930-55-2	N-Nitrosopyrrolidine
U181	99-55-8	5-Nitro-o-toluidine
U193	1120-71-4	1,2-Oxathiolane, 2,2-dioxide
U058	50-18-0	2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetranydro-, 2-oxide
U115	75-21-8	Oxirane (I,T)
U126	765-34-4	Oxiranecarboxyaldenyde
U041	106-89-8	Oxirane, (chloromethyl)-
U182	123-63-7	Paraldehyde
U183	608-93-5	Pentachlorobenzene
U184	76-01-7	Pentachloroethane
U185	82-68-8	Pentachloronitrobenzene (PCNB)
See F027	87-86-5	Pentachlorophenol
U161	108-10-1	Pentanol, 4-methyl-
U186	504-60-9	1,3-Pentadiene (I)
U187	62-44-2	Phenacetin
U188	108-95-2	Phenol
U048	95-57-8	Phenol, 2-chloro-
U039	59-50-7	Phenol, 4-chloro-3-methyl-
U081	120-83-2	Phenol, 2,4-dichloro-
U082	87-65-0	Phenol, 2,6-dichloro-
U089	56-53-1	Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)-
U101	105-67-9	Phenol, 2,4-dimethyl-
U052	1319-77-3	Phenol, methyl-
U132	70-30-4	Phenol, 2,2'-methylenebis[3,4,6-trichloro-
U170	100-02-7	Phenol, 4-nitro-

Hazardous waste No.	Chemical abstracts No.	Substance
See F027	87-86-5	Phenol, pentachloro-
See F027	58-90-2	Phenol, 2,3,4,6-tetrachloro-
See F027	95-95-4	Phenol, 2,4,5-trichloro-
See F027	88-06-2	Phenol, 2,4,6-trichloro-
U150	148-82-3	L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-
U145	7446-27-7	Phosphoric acid, lead(2+) salt (2:3)
U087	3288-58-2	Phosphorodithioic acid, O,O-diethyl S-methyl ester
U189	1314-80-3	Phosphorus sulfide (R)
U190	85-44-9	Phthalic anhydride
U191	109-06-8	2-Picoline
U179	100-75-4	Piperidine, 1-nitroso-
U192	23950-58-5	Pronamide
U194	107-10-8	1-Propanamine (I,T)
U111	621-64-7	1-Propanamine, N-nitroso-N-propyl-
U110	142-84-7	1-Propanamine, N-propyl- (I)
U066	96-12-8	Propane, 1,2-dibromo-3-chloro-
U083	78-87-5	Propane, 1,2-dichloro-
U149	109-77-3	Propanedinitrile
U171	79-46-9	Propane, 2-nitro- (I,T)
U027	108-60-1	Propane, 2,2'-oxybis[2-chloro-
U193	1120-71-4	1,3-Propane sultone
See F027	93-72-1	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-
U235	126-72-7	1-Propanol, 2,3-dibromo-, phosphate (3:1)
U140	78-83-1	1-Propanol, 2-methyl- (I,T)
U002	67-64-1	2-Propanone (I)
U007	79-06-1	2-Propenamide
U084	542-75-6	1-Propene, 1,3-dichloro-
U243	1888-71-7	1-Propene, 1,1,2,3,3,3-hexachloro-
U009	107-13-1	2-Propenenitrile
U152	126-98-7	2-Propenenitrile, 2-methyl- (I,T)
U008	79-10-7	2-Propenoic acid (I)
U113	140-88-5	2-Propenoic acid, ethyl ester (I)
U118	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester
U162	80-62-6	2-Propenoic acid, 2-methyl-, methyl ester (I,T)
U194	107-10-8	n-Propylamine (I,T)
U083	78-87-5	Propylene dichloride
U148	123-33-1	3,6-Pyridazinedione, 1,2-dihydro-
U196	110-86-1	Pyridine
U191	109-06-8	Pyridine, 2-methyl-
U237	66-75-1	2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-
U164	56-04-2	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
U180	930-55-2	Pyrrolidine, 1-nitroso-
U200	50-55-5	Reserpine
U201	108-46-3	Resorcinol
U202	[1] 81-07-2	Saccharin, & salts
U203	94-59-7	Safrole
U204	7783-00-8	Selenious acid
U204	7783-00-8	Selenium dioxide
U205	7488-56-4	Selenium sulfide
U205	7488-56-4	Selenium sulfide SeS_2 (R,T)
U015	115-02-6	L-Serine, diazoacetate (ester)
See F027	93-72-1	Silvex (2,4,5-TP)
U206	18883-66-4	Streptozotocin
U103	77-78-1	Sulfuric acid, dimethyl ester
U189	1314-80-3	Sulfur phosphide (R)
See F027	93-76-5	2,4,5-T
U207	95-94-3	1,2,4,5-Tetrachlorobenzene
U208	630-20-6	1,1,1,2-Tetrachloroethane
U209	79-34-5	1,1,2,2-Tetrachloroethane
U210	127-18-4	Tetrachloroethylene
See F027	58-90-2	2,3,4,6-Tetrachlorophenol

Hazardous waste No.	Chemical abstracts No.	Substance
U213	109-99-9	Tetrahydrofuran (I)
U214	563-68-8	Thallium(I) acetate
U215	6533-73-9	Thallium(I) carbonate
U216	7791-12-0	Thallium(I) chloride
U216	7791-12-0	Thallium chloride TlCl
U217	10102-45-1	Thallium(I) nitrate
U218	62-55-5	Thioacetamide
U153	74-93-1	Thiomethanol (I,T)
U244	137-26-8	Thioperoxydicarbonic diamide $[(H_2N)C(S)]_2S_2$, tetramethyl-
U219	62-56-6	Thiourea
U244	137-26-8	Thiram
U220	108-88-3	Toluene
U221	25376-45-8	Toluenediamine
U223	26471-62-5	Toluene diisocyanate (R,T)
U328	95-53-4	o-Toluidine
U353	106-49-0	p-Toluidine
U222	636-21-5	o-Toluidine hydrochloride
U011	61-82-5	1H-1,2,4-Triazol-3-amine
U227	79-00-5	1,1,2-Trichloroethane
U228	79-01-6	Trichloroethylene
U121	75-69-4	Trichloromonofluoromethane
See F027	95-95-4	2,4,5-Trichlorophenol
See F027	88-06-2	2,4,6-Trichlorophenol
U234	99-35-4	1,3,5-Trinitrobenzene (R,T)
U182	123-63-7	1,3,5-Trioxane, 2,4,6-trimethyl-
U235	126-72-7	Tris(2,3-dibromopropyl) phosphate
U236	72-57-1	Trypan blue
U237	66-75-1	Uracil mustard
U176	759-73-9	Urea, N-ethyl-N-nitroso-
U177	684-93-5	Urea, N-methyl-N-nitroso-
U043	75-01-4	Vinyl chloride
U248	[1] 81-81-2	Warfarin, & salts, when present at concentrations of 0.3% or less
U239	1330-20-7	Xylene (I)
U200	50-55-5	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester, (3beta,16beta,17alpha,18beta,20alpha)-
U249	1314-84-7	Zinc phosphide Zn_3P_2, when present at concentrations of 10% or less

[1] CAS Number given for parent compound only.

Please print or typ. with ELITE type *(12 characters/inch)* in the unshaded areas only

GSA No. 0246-EPA-07

EPA U.S. ENVIRONMENTAL PROTECTION AGENCY
NOTIFICATION OF HAZARDOUS WASTE ACTIVITY

INSTALLATION'S EPA I.D. NO.

I. NAME OF INSTALLATION

II. INSTALLATION MAILING ADDRESS

III. LOCATION OF INSTALLATION

PLEASE PLACE LABEL IN THIS SPACE

INSTRUCTIONS: If you received a preprinted label, affix it in the space at left. If any of the information on the label is incorrect, draw a line through it and supply the correct information in the appropriate section below. If the label is complete and correct, leave Items I, II, and III below blank. If you did not receive a preprinted label, complete all items. "Installation" means a single site where hazardous waste is generated, treated, stored and/or disposed of, or a transporter's principal place of business. Please refer to the INSTRUCTIONS FOR FILING NOTIFICATION before completing this form. The information requested herein is required by law *(Section 3010 of the Resource Conservation and Recovery Act).*

DETACH

FOR OFFICIAL USE ONLY

COMMENTS: C

INSTALLATION'S EPA I.D. NUMBER	APPROVED	DATE RECEIVED (yr., mo., & day)
FCA1800004503421		800818

18 AUG 1980

I. NAME OF INSTALLATION

NASA-AMES RESEARCH CENTER

II. INSTALLATION MAILING ADDRESS

STREET OR P.O. BOX: ENVIRONMENTAL HEALTH & SAFETY

CITY OR TOWN	ST.	ZIP CODE
MOFFETT FIELD	CA	94035

III. LOCATION OF INSTALLATION

STREET OR ROUTE NUMBER: ~~SAME~~ ENVIRONMENTAL HEALTH & SAFETY

CITY OR TOWN	ST.	ZIP CODE
MOFFETT FIELD	CA	94035

IV. INSTALLATION CONTACT

NAME AND TITLE *(last, first, & job title)*	PHONE NO. *(area code & no.)*
HABERMEYER, JOHN CHIEF EH&S	408-965-5002

V. OWNERSHIP

A. NAME OF INSTALLATION'S LEGAL OWNER: NASA US GOVERNMENT

B. TYPE OF OWNERSHIP *(enter the appropriate letter into box)*

F = FEDERAL
M = NON-FEDERAL

F

VI. TYPE OF HAZARDOUS WASTE ACTIVITY *(enter "X" in the appropriate box(es))*

- [X] A. GENERATION
- [ ] B. TRANSPORTATION *(complete item VII)*
- [ ] C. TREAT/STORE/DISPOSE
- [ ] D. UNDERGROUND INJECTION

VII. MODE OF TRANSPORTATION *(transporters only - enter "X" in the appropriate box(es))*

- [ ] A. AIR
- [ ] B. RAIL
- [ ] C. HIGHWAY
- [ ] D. WATER
- [ ] E. OTHER *(specify)*:

VIII. FIRST OR SUBSEQUENT NOTIFICATION

Mark "X" in the appropriate box to indicate whether this is your installation's first notification of hazardous waste activity or a subsequent notification. If this is not your first notification, enter your Installation's EPA I.D. Number in the space provided below.

- [X] A. FIRST NOTIFICATION
- [ ] B. SUBSEQUENT NOTIFICATION *(complete item C)*

C. INSTALLATION'S EPA I.D. NO.

IX. DESCRIPTION OF HAZARDOUS WASTES

Please go to the reverse of this form and provide the requested information.

I.D. – FOR OFFICIAL USE ONLY

W CA1 800005034 2 1

IX. DESCRIPTION OF HAZARDOUS WASTES *(continued from front)*

A. HAZARDOUS WASTES FROM NON–SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.31 for each listed hazardous waste from non–specific sources your installation handles. Use additional sheets if necessary.

1	2	3	4	5	6
7	8	9	10	11	12

B. HAZARDOUS WASTES FROM SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.32 for each listed hazardous waste from specific industrial sources your installation handles. Use additional sheets if necessary.

13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

C. COMMERCIAL CHEMICAL PRODUCT HAZARDOUS WASTES. Enter the four–digit number from 40 CFR Part 261.33 for each chemical substance your installation handles which may be a hazardous waste. Use additional sheets if necessary.

31 P022	32 P029	33 P032	34 P048	35 P054	36 P098
37 P101	38 U002	39 U003	40 U006	41 U009	42 U012
43 U013	44 U019	45 U044	46 U052	47 U056	48 U103 *

Cont

D. LISTED INFECTIOUS WASTES. Enter the four–digit number from 40 CFR Part 261.34 for each listed hazardous waste from hospitals, veterinary hospitals, medical and research laboratories your installation handles. Use additional sheets if necessary.

49	50	51	52	53	54

E. CHARACTERISTICS OF NON–LISTED HAZARDOUS WASTES. Mark "X" in the boxes corresponding to the characteristics of non–listed hazardous wastes your installation handles. *(See 40 CFR Parts 261.21 – 261.24.)*

☒ 1. IGNITABLE (D001) ☒ 2. CORROSIVE (D002) ☒ 3. REACTIVE (D003) ☒ 4. TOXIC (D000)

X. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE	NAME & OFFICIAL TITLE *(type or print)*	DATE SIGNED
John G. Habermeyer	John G. Habermeyer Environmental Health & Safety Manager	August 14, 1980

EPA Form 8700-12 (6-80) REVERSE

* U104 U134 U188 U239
U108 U152 U196
U112 U154 U211
U117 U159 U213
U123 U162 U220
U133 U169 U228

C

LISTING SITE INSPECTION
FOR
NASA AMES RESEARCH CENTER
MOFFETT FIELD, CALIFORNIA

June 1992
EKI 920008.02

Erler & Kalinowski, Inc.

Consulting Engineers and Scientists

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15 June, 1992

Ms. Marla Harrison
NASA Ames Research Center
Mail Stop 213-13
Moffett Field, California 94035-1000

Subject: Listing Site Inspection
NAS2-13546
(EKI 920008.02)

Dear Ms. Harrison:

Erler & Kalinowski ("EKI") is pleased to submit 20 copies of this Listing Site Inspection ("LSI") for the NASA Ames Research Center, Moffett Field, California in accordance with our Statement of Work dated 23 January 1992.

Presented in this LSI report are the results of the soil sampling implemented as set forth in the LSI Work Plan and the calculated HRS score for the NARC. The HRS score sheets and accompanying rationale are included in Appendix C.

If you have any questions, please contact us.

Very truly yours,

ERLER & KALINOWSKI, INC.

Stephen A. Tarantino

Stephen A. Tarantino, P.E.
Project Manager

Annie Kersting

Annie Kersting, Ph.D.
Project Geologist

LISTING SITE INSPECTION

NASA AMES RESEARCH CENTER
MOFFETT FIELD, CALIFORNIA

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(EKI 920008.02)

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1.0 EXECUTIVE SUMMARY

This Listing Site Inspection ("LSI") report has been prepared by Erler & Kalinowski, Inc. ("EKI") on behalf of NASA Ames Research Center ("NARC"). This work has been performed as requested by the U.S. Environmental Protection Agency ("EPA") in a letter to NARC dated 30 October 1990 (EPA, 1990). The LSI was carried out in accordance with the sampling rationale and analysis methods proposed in the LSI Work Plan (EKI, 1992) and approved by the EPA in a letter to NARC dated 31 March 1992.

The primary objective of this LSI was to generate a preliminary site ranking using the revised Hazard Ranking System ("HRS") (EPA, 1990) by evaluating all available groundwater, surface water, shallow soil and air sampling data collected to date at NARC. The EPA also requested additional chemical data from exposed shallow soil areas that may potentially be impacted by chemicals of concern. The soil samples were to be collected to a depth of two feet below ground surface ("bgs"). These new shallow soil data were to be used in the ranking of the soil exposure pathway section of the HRS. This work was requested by the EPA in a letter to NARC dated 30 October 1990.

A total of 51 shallow soil borings were drilled to a depth of 2 feet, from which 127 soil samples were collected for chemical analysis. Soil samples were collected by EKI on 6, 7, and 21 April 1992.

Soil samples were analyzed for polychlorinated biphenyls ("PCBs") and organochlorine pesticides, lead ("Pb"), and mercury ("Hg"). A subset of these soil samples were also analyzed for volatile organic compounds ("VOCs"), semi-volatile organic compounds ("SVOCs"), and other EPA Priority Pollutant Metals (Sb, As, Be, Cd, Cr, Cu, Ni, Se, Ag, Tl, and Zn). Four soil samples from the retention pond and one sample from Stevens Creek were analyzed for salinity.

The HRS is a scoring system used by EPA to assess the relative threat associated with potential releases of hazardous substances at specific sites. The HRS is the primary method used by EPA to determine whether a site is to be included on the National Priorities List ("NPL") (EPA, 1990).

The HRS site ranking was calculated using the soil data from this LSI and available soil, air, groundwater and surface water data previously collected by others. On the basis of these available data, the following conclusions can be made:

- The combined HRS score for the groundwater, surface water, soil, and air migration pathways is 15.77.

- The score of 15.77 is below the cutoff score of 28.5 used by EPA to determine whether a site should be placed on the NPL.

On the basis of the shallow soil data collected in this LSI the following conclusions can be made:

- One hundred twenty-seven shallow soil samples were analyzed for PCBs during this LSI. PCB 1254 was detected in soil samples with a concentration that ranged from non-detectable ("ND") to 3,200 ug/kg, where ND is less than 20 ug/kg. The highest concentrations of PCBs were detected in soil samples collected in the first foot bgs in the open storm drain area, the marsh, and the retention pond (Figures 6 and 7).

- The distribution of PCB 1254, which was detected in the soil samples collected during this LSI, is highly variable. For example, the soil sample that contained the highest detected concentration of PCB 1254 (3,200 ug/kg) was collected at the same depth and adjacent to a soil sample that contained PCB 1254 below the level of detection (i.e. less than 20 ug/kg).

- The concentrations of PCB 1254 detected in eight on-site background soil samples ranged from ND to 49 ug/kg, with a mean value of 24 mg/kg. PCB 1254 was detected at a concentration of 22 ug/kg in two soil samples collected from two off-site locations in Stevens Creek. In the San Francisco South Bay area, the mean concentration of PCBs in the surface periphery sediments collected in 1970 was 75 ug/kg on a dry weight basis (NOAA, 1988). This is equivalent to 56 ug/kg PCB on a wet weight basis using a percent moisture of 25%, typical of that found on-site in the marsh (See Table 1). Thus, PCBs, at low concentrations, are ubiquitous in the soil and sediments in the San Francisco South Bay region, occurring in bay sediments, as well as, Stevens Creek and the background samples collected at NARC.

- Organochlorine pesticides (primarily DDT residuals) were detected in low concentrations in most of the soil areas sampled at NARC. The concentrations of organochlorine pesticides were not significantly elevated compared to the levels detected in the on-site background samples.

- VOCs do not appear to represent an environmental

problem in the shallow soils at NARC. Fifty-five out of 127 shallow soil samples were analyzed for VOCs during this LSI. Acetone was the only VOC detected. Acetone was detected in one soil sample at a concentration of 1,700 ug/kg (i.e. 1.7 parts per million).

- SVOCs do not appear to represent an environmental problem in the shallow soils at NARC. Sixty out of 127 shallow soil samples were analyzed for SVOCs during this LSI. Butyl benzyl phthalate, frequently found in plastics, was the only SVOC detected on-site. Butyl benzyl phthalate was detected in one soil sample at a concentration of 280 ug/kg.

- One hundred twenty-seven shallow soil samples were analyzed for Pb on a wet weight basis during this LSI. The concentrations of Pb in these samples ranged from 1 to 380 mg/kg (1 to 449 mg/kg on a dry weight basis). With the exception of one soil sample from the open storm drain area, the highest concentrations of Pb were detected in soil samples collected in the first foot bgs.

- The concentrations of Pb detected in eight on-site background soil samples ranged from 4 to 17 mg/kg, with a mean value of 9 mg/kg. In the San Francisco South Bay area, the mean concentration of Pb in the surface periphery sediments collected in 1970 was 155 mg/kg on a dry weight basis (NOAA, 1988). In general, the concentrations of Pb detected in the soil samples collected during this LSI are not significantly elevated compared to the mean concentration of Pb detected in the San Francisco South Bay sediments.

- One hundred twenty-seven shallow soil samples were analyzed for Hg on a wet weight basis during this LSI. The concentrations of Hg in these samples ranged from 0.01 to 0.48 mg/kg (0.01 to 0.59 mg/kg on a dry weight basis).

- The concentrations of Hg detected in eight on-site background soil samples ranged from 0.02 to 0.09 mg/kg, with a mean value of 0.06 mg/kg. In the San Francisco South Bay area, the mean concentration of Hg in the surface periphery sediments collected in 1970 was 0.66 mg/kg on a dry weight basis (NOAA, 1988). The concentrations of Hg detected in the soil samples collected during this LSI are less than the mean concentration of Hg detected in the San Francisco South Bay sediments.

- The average concentration of other Priority Pollutant Metals (Sb, As, Be, Cd, Cr, Cu, Ni, Se, Ag, Tl, and Zn)

detected in selected soil samples from NARC are similar in magnitude to the average concentrations measured in the background soil samples collected from the on-site marsh area (See Table 2). No individual soil sample had elevated concentrations of these metals compared to the mean value.

2.0 INTRODUCTION

2.1 Background

This Listing Site Inspection ("LSI") report has been prepared by Erler & Kalinowski, Inc. ("EKI") on behalf of NASA Ames Research Center ("NARC"). This work has been performed as requested by the U.S. Environmental Protection Agency ("EPA") in a letter to NARC dated 30 October 1990 (EPA, 1990). The LSI was carried out in accordance with the sampling rationale and analysis methods proposed in the LSI Work Plan (EKI, 1992) and approved by the EPA in a letter to NARC dated 31 March 1992.

The NARC has been subject to Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"). Section 120 (d) of CERCLA stipulates that those facilities on the Federal docket must perform a Preliminary Assessment ("PA") to identify sites where hazardous materials have been used or disposed. Based on data provided in the PA (EBASCO, 1988), the EPA determined that a site investigation ("SI") was warranted. The EPA further decided, based on the results of the SI (EBASCO, 1989), that a LSI was necessary to further characterize the extent of chemicals of concern in the shallow soil. Specifically, further soil characterization was requested in order to evaluate the potential human exposure to chemicals via the soil pathway.

These new shallow soil chemical data, in conjunction with previously collected shallow soil data, serve as a basis for evaluating the soil exposure pathway section of the revised Hazard Ranking System ("HRS") (EPA, 1990). In addition to the soil data, previously collected air, groundwater and surface water data were evaluated, and a preliminary site ranking was completed using the revised HRS.

This LSI report presents the results of sampling implemented as set forth in the LSI Work Plan, and the HRS score for the NARC. The results of previous environmental investigations are summarized in Chapter 3 of this report. The field procedures and laboratory protocols are discussed in Chapter 4. The distribution of the chemicals of concern detected in the shallow soil samples are reported in Chapter 5 and discussed in Chapter 6. The HRS factors for the air, groundwater, surface water, and soil pathways are discussed in Chapter 7. The conclusions of this investigation are presented in Chapter 8. The HRS score sheets and rationale are attached as Appendix C.

The specific field activities performed at NARC during this investigation included:

- o drilling of 51 soil borings to a depth of two feet below ground surface ("bgs"),
- o collection of 127 soil samples, and
- o laboratory analysis of all soil samples.

Chemical analyses of selected soil samples included: organochlorine pesticides and polychlorinated biphenyls ("PCBs"), volatile chlorinated organics ("VOCs"), semi-volatile chlorinated organics ("SVOCs"), lead ("Pb"), mercury ("Hg"), EPA Priority Pollutant Metals (Sb, As, Be, Cd, Cr, Cu, Ni, Se, Ag, Tl, and Zn), and salinity.

Soil samples were collected from the following specific areas identified by NARC where chemicals of concern may be present:

- o the building areas N218, N227, N239, N255, N267, and T350,
- o the open storm drain area, the marsh, and the storm water retention pond,
- o Stevens Creek outfall area, and
- o the former soil disposal area.

The sampling procedures and rationale are described in detail in the LSI Work Plan (EKI, 1992).

At the request of NARC, two additional building areas were added to the sampling agenda after the LSI Work Plan was completed. These two additional soil areas are the Day Care Center (Building T350), and Building N239. The same sampling procedures described in the LSI Work Plan were followed during soil sampling near these additional building areas.

2.2 Site Description

The NARC is located approximately 35 miles southeast of the City of San Francisco and just north of the City of Mountain View, California (Figure 1, Photo 1). The NARC lies along the southern end of the San Francisco Bay, south of the Mid-Peninsula Open Space District and the salt ponds that are maintained by the Leslie Salt Company. Moffett Field Naval Air Station ("MFNAS") is adjacent to NARC. Stevens Creek lies to the immediate west of the NARC property. The San

Francisco Bay National Wildlife Refuge, a state protected marshland, lies to the north of the Leslie Salt Ponds.

NARC is a federally restricted research facility located on 421 acres (Figure 2). The property is secured by a series of locked gates, fences, and guarded access entrances. Approximately 50 buildings and related research facilities are located at the southern end of the facility. The northern most portion of NARC is undeveloped, consisting of uncultivated fields previously leased for agricultural use and non-tidal marshlands. The marshlands and grasslands on the NARC property within the diked, non-tidal ponding area at the northern end of the facility (referred to in this LSI as "the storm water retention pond"), and the area south of Perimeter Road (referred to in this LSI as "the marsh") have been defined as wetlands for the conservative purposes of the HRS scoring. North of the retention pond are man-made levees separating the NARC from the Leslie Salt Ponds, the San Francisco Bay National Wildlife Refuge, and the San Francisco Bay (Photo 1). According to the Ames Master Plan, no future development is planned for the wetlands areas on NARC property (CTRI/CTRI/CDMI, 1991).

The NARC is devoted to research and development in aeronautics, space science and exploration, space research and technology, space transportation, and energy. NARC was established in 1939 as a National Advisory Committee for Aeronautics (NACA) research and aircraft testing facility. In 1958, the name of the research facility was changed to NASA Ames Research Center. Since that time, a variety of support functions and other research and development laboratories have been built on the property.

Operations at the NARC facility have generated various hazardous wastes including: metals, solvents, fuels, oils, PCB oils, acids, bases, and radioactive materials (Harrison, 1992).

The shallow soil samples obtained during this LSI were collected from areas located throughout the NARC facility. The former drum storage areas in the vicinity of Buildings N218, N227 and N255 are located at the southern end of the NARC facility (Figure 2). Building N239 is located in the southern end of NARC facility in the vicinity of the MEW groundwater plume (RESI, 1991) (Figure 2). The Child Care Center is located in Building T350 in the southeast area of the NARC facility (Figure 2). Building N267 is located in the northwest area of the NARC facility, an area previously called Navarro Farms (Figure 2). The open storm drain area, marsh, storm water retention pond, Stevens Creek, and the former soil disposal area are located at the northern end of the NARC facility (Figure 2).

The storm drain system for the NARC facility and the western

portion of the Moffett Field Naval Air Station currently opens into a cement lined channel (open storm drain) beginning near Building N250B and flows approximately northeast, parallel to Lindbergh Road (Figures 2 and 5). At the northern end of Lindbergh Road, the water from the storm drain flows through a diversion box equipped with an oil separator and into the marsh via a pipe under the Lindbergh Road. The water ponds in the marsh. During periods of heavy rainfall, excess surface water runoff flows north from the marsh via a pipe under Perimeter Road into the storm water retention pond. The presumed direction of storm water runoff is marked by a dashed line beginning at the northern end of the open storm drain channel on Figures 7, 9, and 11.

If the retention pond area begins to flood, surface water is pumped into Stevens Creek (Stevens Creek outfall area) from the northwestern corner of the Mid-Peninsula Open Space District (Figures 1 and 2; Photo 1). Stevens Creek, located off-site, flows due north and empties into the San Francisco Bay. The last time the pump was operated was in 1983 (Hogan, 1992).

2.3 Site Geology

The NARC facility lies at the southern end of the San Francisco Bay (estuarine environment) and the northern end of the Santa Clara Valley (alluvial basin environment). Examination of subsurface soil information from previously installed borings and monitoring wells reveals that NARC is underlain by complex unconsolidated alluvial fan deposits, consisting of clays, sands and gravels.

The potentiometric surface of the shallow groundwater unit, designated the A aquifer, ranges from approximately 18 feet below mean sea level at the southern boundary to near sea level in the wetlands located at the northern boundary of the facility (RESI, 1991). The flow of the shallow groundwater in the A aquifer is in a northerly direction toward the San Francisco Bay (RESI, 1991).

2.4 The MEW Plume

Known groundwater contamination upgradient of the NARC property has been investigated under the guidance of the EPA for several years. The off-site source area is bounded by Middlefield, Ellis, and Whisman Roads and is referred to as "The MEW Superfund Study Area" (Figure 3) (EPA, 1989; EPA, 1991). The MEW Study Area is comprised of facilities owned or operated by approximately 20 companies, including three major companies: Fairchild Semiconductor Corporation, Intel

corporation, and Raytheon Company (EPA, 1989). Various investigations have identified VOCs in the shallow groundwater collected from wells in the MEW Study Area, south of NARC, and downgradient beneath the MFNAS, and NARC facilities (RFAI, 1991; EPA 1991). See Figure 3 for the approximate surface delineation of the migrating MEW shallow plume (EPA, 1991).

The primary chemicals detected in the shallow groundwater beneath the MEW Study Area and in the downgradient area are: trichloroethene ("TCE"), 1,1,1-trichlorethane ("1,1,1-TCA"), 1,1-dichloroethene ("1,1-DCE"), trans- and cis-1,2-dichloroethene ("1,2-DCE"), 1,1-dichloroethane ("1,1-DCA"), tetrachloroethene ("PCE"), trans- and cis-1,2-dichlorobenzene ("1,2-DCB"), trichlorotrifluoroethane ("CFC 113"), chloroform, vinyl chloride, antimony, cadmium, arsenic, and lead (RFAI, 1991; Kleinfelder, Inc., 1992).

3.0 SUMMARY OF PREVIOUS ENVIRONMENTAL INVESTIGATIONS

The following is a summary of the shallow soil, groundwater, and surface water data obtained from previous environmental investigations that have been reviewed by EKI.

3.1 Summary of Previously Collected Soil Data

The approximate locations, sample identification labels and laboratory analytical results of the shallow soil samples previously collected by others at NARC are shown on Figures 4 and 5 of this report.

3.1.1 Building Areas

During the SI, shallow soil samples were collected in November, 1988, from storage areas in the vicinity of Buildings N218, N220, N227, N255 and N267 and analyzed for a variety of chemicals (Figures 4 and 5) (EBASCO, 1989). An additional environmental soil study near Building N267 was conducted by Chemical Waste Management, Inc. ("CWMI") in 1990. These areas of exposed soil were known or suspected to have been used to store drums of waste oils and water treatment chemicals. Soil samples were analyzed for VOCs and SVOCs, total recoverable petroleum hydrocarbons ("TRPH"), organochlorine pesticides and PCBs, Pb, and Hg.

The shallow soil samples collected near the storage areas at Buildings N218, N220, N227, and N255 did not contain detectable levels of PCBs, VOCs, or SVOCs. The samples did contain low concentrations of TRPH (<10 mg/kg). The pesticide, 4,4-DDE, was detected at a concentration of 38 ug/kg in one soil sample collected near Building N255.

Shallow soil samples collected near Building N267 did not contain detectable levels of PCBs, or SVOCs. Concentrations of TRPH in the shallow soils ranged from non-detect ("ND") to 630 mg/kg. 4,4-DDE was detected at a concentration of 65 ug/kg in one soil sample, B3. Methylene chloride ("MeCl") was detected at a concentration of 7,700 ug/kg in one soil sample, NAV-1. MeCl was not detected in soil sample B3, collected nearby, approximately 200 feet to the southwest of NAV-1. Concentrations of Pb detected in the soil samples ranged from 9 to 72 mg/kg. Concentrations of Hg detected in the soil samples were less than the detection limit of 20 mg/kg.

In August, 1991, three soil samples (P2, P3, and P4) were collected from a depth of 3 feet bgs in the area north of the Day Care Center, Building T350 (Figure 4) (Kleinfelder Inc., 1992). The sampling effort was conducted to determine

if chlorinated solvents had been disposed in a previously vacant lot that is north of the current site of the Day Care Center. Freon 11 was detected in soil sample P2 at a concentration of 15 ug/kg; detection limits were 5 ug/kg. TCE was detected in soil sample P4 at a concentration of 7 ug/kg; detection limits were 5 ug/kg. Acetone was detected in soil sample P4 at a concentration of 39 ug/kg; detection limits were 20 ug/kg.

No shallow soil samples were previously collected in the vicinity of Building N239.

3.1.2 The Open Storm Drain Area, the Marsh, and the Retention Pond Areas

Several previous environmental investigations have focused on shallow soil sampling at locations surrounding the open storm drain, the marsh, and the retention pond. Soil samples collected from the open storm drain area, the marsh and the retention pond were analyzed for organochlorine pesticides and PCBs, Pb, Hg, and TRPH (Figure 5) (Safety Specialists, Inc., 1989; EBASCO, 1989; CWMI, 1992).

VOCs were not detected in soil samples previously collected from the open storm drain area, the marsh, or the retention pond. Low concentrations of polynuclear aromatics ("PNAs") were detected in two soil samples; one from the open storm drain area (SD-4) and one from the retention pond (S-1). Concentrations of Pb collected from soil samples in the open storm drain area, the marsh and the retention pond ranged from 5 to 650 mg/kg. The highest concentration of Pb detected in the soil samples was from one sample collected from the marsh (650 mg/kg). Concentrations of Hg in soil samples collected from the marsh and the retention pond ranged from 0.05 to 0.86 mg/kg. The concentrations of Hg in soils collected from the open storm drain area were not determined.

PCBs were initially detected in soil samples previously collected from the open storm drain area, the marsh, and the retention pond (EBASCO, 1989). Soil sample SD-4 collected in November, 1988, in the vicinity of the open storm drain measured 83,000 ug/kg of PCB 1254. In contrast, soil samples SD-1 and SD-5 collected to the north and to the south of SD-4 had non-detectable levels of PCBs. The soil samples collected in the marsh had concentrations of PCBs that ranged from ND to 48,000 ug/kg. Two soil samples collected from the retention pond, approximately 250 feet apart, had concentrations of PCB 1254 at ND and 3,900 ug/kg.

Additional shallow soil sampling in the open storm drain area, the marsh, and the retention pond was undertaken in July, 1989, by Safety Specialists Inc. (Safety Specialists, Inc., 1990). Concentrations of PCBs in seven shallow soil

samples ranged from 300 to 3,000 ug/kg. The concentration of Pb measured in the seven soil samples ranged from 23 to 390 mg/kg. These samples were not shown on Figure 5 for reasons of clarity, as they were collected in the vicinity of soil samples shown on Figure 5 previously collected by EBASCO (1989) and Safety Specialists, Inc. (1989).

Soil samples collected from the open storm drain area, and the retention pond had concentrations of TRPH that ranged from ND to 130 mg/kg (EBASCO, 1989). The soil samples collected from the marsh had detectable levels of TRPH that ranged from 5 to 4,500 mg/kg (EBASCO, 1989).

The highest concentrations of chemicals (PCBs, TRPH, and Pb) were detected in samples collected closest to where the storm drain water flows into the marsh. The concentration of the chemicals detected generally decreases westward following the presumed direction of water runoff. In addition, the concentrations of chemicals detected decreased with depth. For example, soil sample, M-1-0.5, collected at a depth of 0.5 feet contained 48,000 ug/kg of PCBs; whereas, soil sample M-1-1.0, collected at the same boring location, but at 1.0 foot depth had non-detectable levels of PCBs.

3.1.3 Stevens Creek and the Former Soil Disposal Area

No shallow soil samples were previously collected in the vicinity of the former soil disposal area or Stevens Creek outfall area.

3.2 Summary of Previously Collected Surface Water Data

Surface water samples were collected inside the open storm drain and the retention pond area in June 1988 and November 1988 (Safety Specialists, Inc., 1988; EBASCO, 1989). The samples were analyzed for PCBs, TRPH, and SVOCs. None of the surface water samples had detectable levels of PCBs, TRPH, or SVOCs.

3.3 Summary of Previously Collected Groundwater Data

Groundwater samples have been collected from monitoring wells installed near the storm drainage area, Building N239, Building T350, and Building N255. The following solvents have been detected from these wells in the shallow groundwater beneath the NARC facility: acetone (ND to 35 ug/l), toluene (ND to 4.3 ug/l), 1,1-DCA (ND to 5.7 ug/l), 1,2-DCE (ND to 79 ug/l), TCE (ND to 100 ug/l), and PCE (ND to 6 ug/l) (EBASCO, 1989, Kleinfelder, Inc., 1992). In addition, 1,1,1-TCA (ND to 3.1 ug/l) was detected in

groundwater samples collected near building N255, (EBASCO, 1989). These chemicals were not detected in the laboratory analysis of the immediate overlying soils.

The chemicals that have been detected in shallow groundwater samples have also been identified as constituents of the MEW Superfund Site and NAVY Superfund Site groundwater plumes that are migrating beneath the NARC facility from off-site areas, upgradient to the south, (RFAI, 1991; Kleinfelder Inc., 1992; Olliges, 1992).

Low, but detectable concentrations of PCE, CFC 113, and TCE were reported from soil gas analyses collected in the vicinity of Buildings N218, N227, N255, and the open storm drain area (EBASCO, 1989). These compounds were not subsequently detected in the laboratory analyses of samples collected from the surrounding soil. Therefore, the soil gas measurements most likely reflect vapor transport of the chemicals reportedly detected in the shallow groundwater. These chemicals have all been detected in the shallow groundwater beneath the MEW Study Area (EBASCO, 1989).

3.4 Previous Remedial Action

The concentration of PCB 1254 detected in soil sample SD-4 collected from the open storm drain area was 83,000 ug/kg (see Figure 5 for location). Soil samples SD-1 and SD-5 collected approximately 600 feet to the north and 600 feet to the south had non-detectable concentrations of PCB 1254. EKI has been informed by NARC that the soil in the vicinity of sample SD-4 was excavated by NARC in November, 1989, and disposed of as a hazardous waste (Olliges, 1992).

The concentration of MeCl detected in soil sample NAV-1 collected near Building N267 was 7,700 ug/kg (see Figure 5 for location). Soil sample B3 approximately 200 feet to the south had non-detectable levels of MeCl. In November, 1988, shallow groundwater was collected at the boring location, NAV-1 and analyzed for VOCs (EBASCO, 1989). No VOCs, including MeCl, were detected above the detection limits in the grab sample of groundwater. The soil in the vicinity of sample NAV-1 was excavated by NARC and disposed of as a hazardous waste (Safety Specialists, Inc., 1990).

In December, 1987, an oil spill near Building N227, which was reportedly leaking into the storm drain, was reported to NARC officials (Safety Specialists, Inc., 1988). Investigation and remediation efforts were initiated by NARC. As part of the investigation, soil and surface water samples were collected from the vicinity of Building N227, the storm drain area, marsh, and retention pond. Soil and surface water samples were analyzed for oil and grease and

PCBs. One soil sample contained 214 ug/kg of PCBs and non-detectable levels of TRPH. Two surface water samples collected from the retention pond had detectable levels of PCBs at 2.4 and 4.8 ug/l and non-detectable levels of TRPH (Safety Specialists, Inc., 1988).

Remedial actions, initiated immediately by NARC, consisted of removing soils in the vicinity of Building N227 and flushing the storm drain system with water. The water flushed through the storm drain system and the excavated soils were collected and disposed as hazardous waste (Safety Specialists, Inc., 1988). In May 1988, excavation of soil at the northern end of the open storm drain area was initiated (Safety Specialists, Inc., 1988).

In July 1988, six months after the initial oil spill, a surface water sample was collected from the northern end of the open storm drain (Safety Specialists, Inc., 1990). The surface water sample did not contain detectable levels of PCBs or oil and grease. In November 1988, two surface water samples were collected, one from the retention pond, and one from the open storm drain. These surface water samples did not contain detectable levels of PCBs (EBASCO, 1989).

In order to minimize the potential for the surface water runoff to carry chemicals into the marsh and the retention pond, a storm water retention basin is being constructed (Harrison, 1992). This structure is designed to settle solids and skim oil from the storm water that is later discharged into the marsh and retention pond.

3.5 Summary

In summary, the previously collected analytical data suggest that localized areas of soil have been impacted by chemicals of concern, but there does not appear to be extensive lateral impact of these chemicals across the NARC facility. Furthermore, the soil areas that had the highest detected concentrations of PCBs (83,000 ug/kg) and MeCl (7,700 ug/kg) have since been removed (Safety Specialists, Inc. 1990; Olliges, 1992).

The surface water samples collected in July and November 1988, from the open storm drain area and the retention pond after remediation of the December 1987 oil spill, did not contain detectable levels of PCBs, VOCs, or TRPH (EBASCO, 1989; Safety Specialists, Inc., 1990).

Although chlorinated solvents were detected in samples of on-site shallow groundwater, they were not detected in the immediate, overlying soil samples. The only chlorinated solvent detected in shallow soil was MeCl, detected in one

soil sample, NAV1, located near Building N267. All of the chemicals detected in the groundwater samples have also been detected in the groundwater in the vicinity of the MEW Study Area . Therefore, it appears that the chlorinated solvents detected in the groundwater samples may be related to up-gradient sources that are migrating from the south, off-site and onto the NARC property.

Prior studies have indicated somewhat elevated levels of PCBs and Pb in the first foot of soil collected in the open storm drain area, the marsh, and the retention pond. These areas constitute the storm water drainage system which handles runoff from NARC and portions of Moffett Field Navy Air Station.

4.0 FIELD AND LABORATORY PROCEDURES

4.1 Soil Boring Locations and Sampling Rationale

During April 1992, EKI collected 127 soil samples from 51 shallow boring locations at the NARC facility. The samples were collected to further characterize the horizontal and vertical extent of chemicals of concern in selected areas of NARC. The location of the 51 borings are shown on Figures 6 and 7.

One, two, or three soil samples were collected from each boring to a depth of two feet bgs. The soil samples were collected from depth intervals of 0-0.5, 0.5-1.0, 1.0-1.5, or 1.5-2.0 feet bgs. For example, near Building N239, three soil samples were collected from soil boring location, 239-H001. A soil sample was collected from 0-0.5 feet (sample I.D.: 239-H001-0.5), 0.5-1.0 (239-H001-1.0) and 1.0-1.5 (239-H001-1.5).

Prior to the initiation of drilling operations, underground utilities were located by NARC engineering personnel. In addition, Underground Service Alert ("USA") was notified of the 51 boring locations. Permission to sample in the vicinity of Stevens Creek was obtained from the Santa Clara Valley Water District ("SCVWD").

The general procedures for sampling the soil are discussed in Section 6 of the approved LSI Work Plan. Relatively undisturbed soil samples were collected by driving a modified California split-spoon sampler, containing clean 6-inch long stainless steel liners into the soil. Soil borings were drilled by Precision Sampling Inc. using a hydraulic drive-sampler. The drill rods were steam-cleaned prior to use to prevent cross-contamination between borings.

In the marsh, retention pond, and Stevens Creek areas, heavy drilling equipment is not allowed. In these areas, soil samples were collected using a hand-driven split spoon sampler equipped with clean 6-inch long stainless steel liners. Once the samples were retrieved, they were sealed with Teflon sheets, capped with plastic caps, labeled, and placed on blue ice in a cooler for transport under chain of custody to a California certified laboratory. The chain of custody sheets are in Appendix A.

Four of the 127 soil samples were collected as field duplicates as a measure of sample variability (See Table 1 for sample identification). The field duplicate soil samples were collected adjacent to the initial samples, at the same depth bgs. The duplicate soil samples were collected at locations selected across the NARC facility:

one soil sample from the open storm drain area (SD-H008-0.5), one soil sample from the marsh (M-H004-0.5), one sample from the retention pond (RP-H005-0.5), and one soil sample near Building N255 (255-H002-1.5). These soil sample duplicates were collected, numbered, packaged, and sealed in the same manner as the other samples. The duplicates had separate sample numbers and were submitted blind to the laboratory.

Four soil sampling locations, from the western end of the marsh area, were selected to be used as background samples (M-H005, M-H006, M-H007, M-H008) (See Figure 7 for location). These samples are thought to be representative of the local background chemical composition of the soil in the marsh and storm water retention pond areas. The samples were collected in the western end of the marsh, at locations believed to be removed from any influence from the storm drain system. Two soil samples were collected at each location. The physical composition of these background soil samples appeared similar to the other soil samples collected in the marsh and the retention pond. The background samples were collected in the same manner as the other soil samples.

All excess soils, drill cuttings, and wastewater generated during the decontamination of sampling equipment were collected and stored in 55 gallon drums, sealed with a metal ring and bolt, and left on-site in a designated location for disposal by NARC, as appropriate. The drums were labeled as to contents, date, and time collected.

4.2 Chemical Analyses

Selected soil samples were analyzed for a variety of chemicals including: organochlorine pesticides, PCBs, VOCs, SVOCs, Pb, Hg, and salinity. The EPA Methods utilized for analyzing the chemicals of concern include: 8080 for PCBs and organochlorine pesticides, 8240 for VOCs, 8270 for SVOCs, 7421 (AA) for Pb, and 7471 (cold vapor) for Hg. The percent moisture was measured in the soil samples collected from the open storm drain area, the marsh, the retention pond, and Stevens Creek. The sample identification, the depths of the samples collected from each boring, the analytes measured, and the EPA Method used are presented in Tables 1 and 2.

In addition, the background soil samples from the marsh and selected soil samples from the former soil disposal area were analyzed for other EPA Priority Pollutant Metals (Sb, As, Be, Cd, Cr, Cu, Ni, Se, Ag, Tl, and Zn) Four soil samples collected from the retention pond and one soil sample collected from Stevens Creek were analyzed for salinity content. The salinity data was obtained as

requested by NARC to provide additional information for an ongoing salinity study of the retention pond by Moffett Field Naval Air Station (Harrison, 1992).

Based on the results of prior investigations, the primary chemicals of concern in the shallow soil at NARC were PCBs, Pb and Hg. VOCs and SVOCs did not appear to be ubiquitous in the areas that were previously sampled; therefore, EKI analyzed for these chemicals only in areas that either had not been previously sampled for VOCs and SVOCs (e.g., N227, Stevens Creek, Former Soil Disposal Area, T350, and N239), or in areas where these chemicals are known to be currently stored (e.g., N255).

5.0 RESULTS OF THE SHALLOW SOIL SAMPLING

One hundred twenty-seven shallow soil samples were collected from a total of 51 boring locations at NARC as part of this LSI. The soil borings extend to a depth of two feet bgs. Soil samples were collected by EKI on 6, 7, and 21 April 1992.

To facilitate the following discussion, the analytical results of the shallow soil samples are grouped by the following areas:

- the building areas
- the open storm drain area, the marsh, and the retention pond
- the former soil disposal area
- Stevens Creek outfall area, and
- the background samples.

The sample identification, the depths of the samples collected from each boring, the analytes measured and the EPA method used are presented in Tables 1 and 2. The results of the soil analyses collected during this LSI are shown on Figures 6 through 11. A complete set of laboratory analysis sheets are provided in Appendix B.

All the soil samples were analyzed as received, on a wet weight basis. The percent moisture was determined for all the samples that were collected in the open storm drain area, the marsh, the retention pond, and Stevens Creek to allow determination of metal concentrations on a dry weight basis. The range of detection limits for the specific chemicals, which were detected in more than one location, are listed below:

Analyte	Detection Limits
PCB 1254	20 to 2000 ug/kg
4,4-DDD	6 to 300 ug/kg
4,4-DDE	2 to 100 ug/kg
4,4-DDT	6 to 300 ug/kg
Pb	0.25 mg/kg
Hg	0.01 mg/kg

5.1 Results from Building Areas

5.1.1 Building Area N218

An area of approximately 2,500 square feet of exposed soil near Building N218 was reportedly previously used to store drums of waste oil. Soil samples collected previously in this area detected up to four mg/kg TRPH (EBASCO, 1989). No VOCs or SVOCs were detected (EBASCO, 1989).

Four soil samples, two from each of two soil boring locations, were collected by EKI (Table 1, Figures 6, 8, 10). All four soil samples were analyzed for PCBs and organochlorine pesticides, Pb, and Hg.

PCB 1254 was detected in two soil samples collected from the same boring location: 218-H002-0.5 at 730 ug/kg, and 218-H002-1.0 at 33 ug/kg. 4,4-DDT was detected in the same two soil samples: 218-H002-0.5 at 160 ug/kg, and 218-H002-1.0 at 11 ug/kg. 4,4-DDE was detected at four ug/kg in soil sample 218-H002-1.0. The concentrations of Pb and Hg in these soil samples ranged from 5 to 380 mg/kg, and 0.05 to 0.41 mg/kg, respectively.

5.1.2 Building Area N227

The soil area on the west side of Lane C near Building N227 was reportedly used to store drums of waste oil. Currently, this area is used to store drums of acetone. The east side of Lane C was previously an empty lot but a new chemical storage facility is currently being built. No PCBs, VOCs, or SVOCs were previously detected. TRPH was detected at a concentration of 4 mg/kg from one soil sample collected near Building N227 (EBASCO, 1989).

Five soil samples from three boring locations were collected by EKI (Table 1, Figures 6, 8, 10). Four soil samples, two from each of two soil boring locations, were collected in the lot, east of Lane C. One surface soil sample was collected adjacent to the drums of acetone; a large high pressure pipe located just below the surface prevented collection of additional samples from deeper depths. Soil samples were analyzed for organochlorine pesticides and PCBs, VOCs, SVOCs, Pb, and Hg.

No SVOCs or organochlorine pesticides were detected. PCB 1254 was detected in two surface soil samples collected in the empty lot: 227-H002-0.5 at 44 ug/kg, and 227-H003-0.5 at 25 ug/kg. Acetone was detected at 1700 ug/kg in the surface soil sample, 227-H003-0.5, collected on the west side of Lane C where drums of acetone are currently stored. The detection limit for acetone was 500 ug/kg. The concentrations of Pb and Hg in the soil samples range from 2

to 67 mg/kg, and 0.01 to 0.17 mg/kg, respectively.

5.1.3 Building Area N239

Building N239 is located in the southern area of NARC in the vicinity of the MEW plume. No previous shallow soil sampling has occurred in this area.

Six soil samples, three from each of two boring locations, were collected by EKI northeast of Building N239 (Table 1, Figures 6, 8, 10). The soil samples were analyzed for VOCs, SVOCs, Pb, and Hg.

No VOCs or SVOCs were detected. The concentrations of Pb and Hg in the soil samples ranged from 6 to 67 mg/kg, and 0.03 to 0.09 mg/kg, respectively.

5.1.4 Building Area N255

The soil area north of the parking lot for Building N255 was previously used for farming. Drums of oil and chlorinated solvents were reportedly stored the northern end of the parking lot near the fields used for agriculture. A new chemical storage building is now located where the drums were previously stored. The chemical storage building currently stores compressed gasses, hydraulic fluids, lubricating oils, and TCA. One soil sample previously collected in November, 1988, from this area contained 10 mg/kg TRPH and 38 ug/kg 4,4-DDE (EBASCO, 1989). No PCBs, VOCs, or SVOCs were previously detected.

Seven soil samples were collected by EKI from three soil boring locations near Building N255 (Table 1, Figures 6, 8, 10). Soil samples were analyzed for PCBs and organochlorine pesticides, VOCs, SVOCs, Pb, and Hg. Soil sample, 255-H002-1.5, was collected as a blind duplicate to soil sample RP-H001-1.5.

No PCBs, VOCs, or SVOC were detected. 4,4-DDE was detected in all seven soil samples at concentrations that ranged from 330 to 390 ug/kg. 4,4-DDT was detected in two soil samples: 255-H002-1.5 at 79 ug/kg, and 255-H003-1.5 at 20 ug/kg. The concentrations of Pb and Hg in the soil samples ranged from 7 to 9 mg/kg, and 0.05 to 0.07 mg/kg, respectively.

5.1.5 Building Area N267

The construction of Building N267, located north of Perimeter Road on the western border of the NARC facility, has recently been completed in May, 1992 (Table 1, Figures 7, 9, 11). The area was formerly called Navarro Farms. Soil from various other NARC locations has been reportedly used as fill along the eastern perimeter fence. The eastern corner of the Navarro Farms area contains piles of broken

cement blocks.

Drums of waste oil and possibly chlorinated solvents were reportedly stored along the eastern perimeter fence. SVOCs and PCBs were not previously detected (EBASCO, 1989). In November, 1988, TRPH (88 mg/kg) and MeCl (7,700 ug/kg) were detected from one soil sample, NAV-1 (EBASCO, 1989). The soil in the vicinity of NAV-1 was excavated by NARC and disposed of as hazardous waste (Safety Specialists, Inc., 1990). The concentrations of Pb in the soil samples ranged from 9 to 72 mg/kg (CWMI, 1990).

Five soil samples were collected by EKI from a total of three boring locations. All five soil samples were analyzed for PCBs and organochlorine pesticides, SVOCs, Pb, and Hg.

No PCBs or SVOCs were detected. 4,4-DDE was detected in two soil samples: 267-H001-0.5 at 70 ug/kg, and 267-H003-0.5 at 13 ug/kg. The concentrations of Pb and Hg in the soil samples ranged from 1 to 36 mg/kg, and 0.07 to 0.15 mg/kg, respectively.

5.1.6 Building Area T350

Building T350, presently used as a Day Care Center, is located in the eastern section of NARC (Table 1, Figures 6, 8, 10). Shallow soils (< 2 feet) have not been previously analyzed in the vicinity of the Day Care Center.

Twelve soil samples were collected by EKI, three from each of four boring locations, at the northern end of the Day Care Center. All soil samples were analyzed for PCBs and organochlorine pesticides, VOCs, SVOCs, Pb, and Hg.

VOCs were not detected. Three of the 12 soil samples had detectable levels of PCB 1254 ranging from 42 to 52 ug/kg. The pesticide 4,4-DDE was detected in two of the 12 soil samples at concentrations of 4 and 160 ug/kg. Butyl benzyl phthalate was detected in one soil sample at a concentration of 280 ug/kg. The detection limit for butyl benzyl phthalate was 100 ug/kg. The concentrations of Pb and Hg in the soil samples ranged from 6 to 22 mg/kg, and 0.01 to 0.12 mg/kg, respectively.

5.2 Results from the Open Storm Drain Area, the Marsh, and the Retention Pond

The storm drain system for the NARC facility and the western portion of the Moffett Field Naval Air Station opens into a cement channel beginning near Building N250B and runs approximately northeast, parallel to Lindbergh Road (Figures 2 and 5). Exposed soil occurs on both sides of the cement

channel (open storm drain area). At the northern end of Lindbergh Road, the water from the storm drain is channeled via a diversion box under Lindbergh Road into the marsh. The water ponds in the eastern end of the marsh, and runoff is channeled north into the retention pond via a pipe under Perimeter Road.

In the past, the storm water drainage system received wastewater containing chemicals and oil (Harrison, 1992). These were primarily cooling-tower, water-treatment chemicals and wastewater from shop sinks. Currently only rain water and non-contaminated groundwater from NARC routinely flows into the storm drain system (Harrison, 1992).

5.2.1 Open Storm Drain Area

Chemicals of concern previously detected in soil samples collected from the open storm channel area include: PCB 1254 (ND to 83,000 ug/kg), TRPH (ND to 130 mg/kg), and Pb (ND to 44 mg/kg) (EBASCO, 1989). Soil in the vicinity of soil sample SD-4 (83,000 mg/kg of PCB 1254, and 130 mg/kg TRPH) was removed and disposed as hazardous waste (Olliges, 1992). No VOCs were previously detected (EBASCO, 1989).

Twenty-two soil samples were collected by EKI from eight boring locations along the open storm drain and immediately north of where the diversion box channels the run-off water under Lindbergh Road (Table 1, Figures 7, 9, 11). Soil samples were analyzed for PCBs and organochlorine pesticides, Pb, and Hg. Soil sample, SD-H008-0.5 was collected as a blind duplicate to soil sample SD-H007-0.5.

The concentration of PCB 1254 detected in the soil samples ranged from ND to 4,500 ug/kg. 4,4-DDT was detected in two soil samples at concentrations of 15 and 530 ug/kg. The field duplicate sample, SD-H008-0.5, did not contain concentrations of 4,4-DDT above the detection limit. 4,4-DDD and 4,4-DDE were detected in soil sample, SD-H006-1.5, at concentrations of 12 and 17 ug/kg, respectively. The concentrations of Pb and Hg in the soil samples ranged from 3 to 260 mg/kg, and 0.03 to 0.48 mg/kg, respectively.

5.2.2 The Marsh

The marsh is located north of Building N249 and west of the open storm drain area (Figure 2). Water from the open storm channel is diverted into the northeastern end of the marsh. The run-off water from the storm drain ponds in the northeastern corner of the marsh.

PCBs (ND to 48,000 ug/kg) and TRPH (ND to 4,500 mg/kg) were previously detected in soil samples collected from the marsh (EBASCO, 1989). The concentration of Pb detected in the

soil samples ranged from 5 to 650 mg/kg (EBASCO, 1989). The soil sample that measured 650 mg/kg of Pb, Sample 1, was collected approximately 100 feet south of where the storm water is channeled into the retention pond, under Perimeter Road (Figure 5). VOCs and SVOCs were not previously detected (EBASCO, 1989).

Ten soil samples were collected by EKI from a total of four boring locations in the marsh (Table 1, Figures 7, 9, 11). Soil samples were analyzed for PCBs and organochlorine pesticides, Pb, and Hg. Soil sample, M-H004-0.5, was collected as a blind duplicate to soil sample MP-H003-0.5.

PCB 1254 was detected in five soil samples with a range in concentration from 64 to 1,400 ug/kg. The highest concentrations of PCB 1254 were detected in surface samples collected near the storm water discharge point located at the eastern end of the marsh. PCB 1254 was not detected in soil samples collected below 1.5 foot depth. BHC (lindane) was detected in one surface soil sample at 5 ug/kg. The detection limit for BHC was 2 ug/kg. The concentrations of Pb and Hg in the soil samples ranged from 6 to 190 mg/kg, and 0.02 to 0.75 mg/kg, respectively.

5.2.3 The Retention Pond

The storm water retention pond lies north of the marsh and the open storm drain (Figure 2, Photo 1). It is bounded to the west by the Mid-Peninsula Open Space District and Stevens Creek. To the north and west a combination of levees built by Leslie Salt Company and the Moffett Field Naval Air Field separate the retention pond from the salt ponds.

PCBs (ND to 3,900 ug/kg), TRPH (14 to 110 mg/kg), and endosulfan (ND to 150 ug/kg) were previously detected in soil samples collected from the retention pond (EBASCO, 1989). Concentrations of Pb detected in the soil samples ranged from 9 to 290 mg/kg (EBASCO, 1989).

Thirty-one soil samples were collected by EKI from a total of 11 boring locations in the retention pond (Table 1, Figures 7, 9, 11). Soil samples were analyzed for PCBs and organochlorine pesticides, Pb, and Hg. Four soil samples were analyzed for salinity. Soil sample, RP-H005-0.5, was collected as a blind duplicate to soil sample RP-H004-0.5.

PCB 1254 was detected in six of the 31 soil samples with a range in concentration from 34 to 3,200 ug/kg. The highest concentrations of PCB 1254 were detected in surface samples collected from the top six inches of soil. PCB 1254 was not detected in soil samples collected below 1.0 foot depth. 4,4-DDD and 4,4-DDE were detected in five soil samples at concentrations less than 30 ug/kg. The concentrations of Pb

and Hg in the soil samples ranged from 2 to 220 mg/kg, and 0.02 to 0.45 mg/kg, respectively. The salinity ranged from 1.0 to 8.9. The salinity content is normalized to the salinity of sea water, and therefore is unitless.

5.3 Results from the Former Soil Disposal Area

The former soil disposal area is located north of the Perimeter Road at gate 16C and reportedly consists of an accumulation of soils from other locations at NARC (Figure 2). It is no longer used to deposit soil. This area has not recently been sampled by NARC.

Eight soil samples were collected by EKI, two from each of four boring locations (Tables 1 and 2, Figures 7, 9, 11). The soil samples were analyzed for PCBs and organochlorine pesticides, VOC, SVOCs, Pb, and Hg. In addition, four soil samples were analyzed for the following EPA Priority Pollutant Metals: Sb, As, Be, Cd, Cr, Cu, Ni, Se, Ag, Tl, and Zn

No VOCs or SVOCs were detected. Concentrations of PCB 1254 were detected in soil samples ranging from ND to 710 ug/kg. 4,4-DDE was detected in four soil samples with range in concentration from 4 to 27 ug/kg. The concentrations of Pb and Hg in the soil samples ranged from 5 to 40 mg/kg, and 0.07 to 0.26 mg/kg, respectively.

The calculated means of the EPA Priority Pollutant Metals in four soil samples from the former soils disposal area are:

Element	Average Concentration
Sb	7 mg/kg
Be	0.57 mg/kg
Cd	0.55 mg/kg
Cr	50 mg/kg
Cu	23 mg/kg
Ni	51 mg/kg
Se	<2.5 mg/kg
Ag	<0.50 mg/kg
Tl	<0.25 mg/kg
Zn	69 mg/kg
Pb	21 mg/kg
Hg	0.15 mg/kg.

In the case where the concentration of an element was less than the reported detection limit, the detection limit value was used in the calculation of the mean. No individual concentrations were significantly elevated compared to the

mean.

5.4 Results from Stevens Creek Outfall Area

Stevens Creek, which is located off-site, flows northward parallel to the western boundary of the NARC facility and empties into the San Francisco Bay. In the northwestern corner of the Mid-Peninsula Open Space District, north of Building N267, a pump system exists to pump excess water from the NARC retention pond into Stevens Creek. This system is activated only during times of flooding. It has not been used since 1983 (Hogan, 1992). Stevens Creek has not been previously sampled by NARC.

Nine soil samples were collected by EKI, three from each of three boring locations, in the Stevens Creek area (Table 1, Figures 7, 9, 11). One boring location was located at the outfall area, in the vicinity of the pump in the Mid-Peninsula Open Space District. The second boring location was downstream of the outfall pump in Stevens Creek, and the third boring location was upstream of the outfall pump in Stevens Creek. The soil samples were analyzed for PCBs and organochlorine pesticides, VOCs, SVOCs, Pb, and Hg. One sample was measured for salinity.

PCB 1254 was detected at low levels in shallow soil samples from all three boring locations. The concentrations of PCB 1254 detected in the soil samples from the Stevens Creek area ranged from 22 to 43 ug/kg. In addition, PNAs were detected in soil samples collected from all three boring locations. PNAs that were detected include: benzofluoranthene, benzoperylene, benzopyrene, fluoranthene, indenopyrene, and pyrene. The concentrations of individual PNAs ranged from ND to 210 ug/kg. Detection limits for these chemicals ranged from 100 to 200 ug/kg. The concentrations of Pb and Hg in the soil samples ranged from 7 to 17 mg/kg, and 0.09 to 0.20 mg/kg, respectively.

5.5 Results from the Background Samples

Eight soil samples were collected by EKI, two from each of four boring locations, in the western end of the marsh area (Tables 1 and 2, Figures 7, 9, 11). This area is believed to be removed from any influence of the storm drain system. No known farming or NARC activities occurred at the background locations. The composition of these samples should be representative of the average background chemistry of the soils in the marsh and the storm water retention pond areas. The physical composition of these background soil samples was similar to the other soil samples collected in

the marsh and the retention pond. The soils were analyzed for PCBs and organochlorine pesticides, VOCs, SVOCs, Pb, Hg, and the following EPA Priority Pollutant Metals: Sb, As, Be, Cd, Cr, Cu, Ni, Se, Ag, Tl, and Zn.

No VOCs or SVOCs were detected. Seven of the eight background soil sample did not have detectable levels of PCBs. One sample, M-H008-0.5, contained 49 ug/kg of PCB 1254. All four surface samples contained detectable levels of the pesticide 4,4-DDE. The concentrations of 4,4-DDE detected in the surface soil samples ranged from 4 to 17 ug/kg. 4,4-DDT was detected in one sample, M-H008-0.5, at a concentration of 8 ug/kg. The concentrations of Pb and Hg in the background soil samples on a wet weight basis ranged from 4 to 17 mg/kg, and 0.02 to 0.09 mg/kg, respectively.

A mean was calculated for each Priority Pollutant Metal by averaging the concentrations of that element in all eight soil samples. The calculated means for the background soil samples are:

Element	Average Concentration
Sb	9 mg/kg
As	16 mg/kg
Be	0.62 mg/kg
Cd	<0.17 mg/kg
Cr	49 mg/kg
Cu	20 mg/kg
Ni	52 mg/kg
Se	<2.5 mg/kg
Ag	<0.50 mg/kg
Tl	<0.25 mg/kg
Zn	50 mg/kg
Pb	10 mg/kg
Hg	0.06 mg/kg.

In the case where the concentration of an element was less than the reported detection limit, the detection limit value was used in the calculation of the mean. No individual concentrations were elevated compared to the calculated mean.

6.0 DISCUSSION OF THE SHALLOW SOIL, GROUNDWATER, AND SURFACE WATER DATA

In order to provide an updated environmental evaluation of the NARC study areas, the following discussion incorporates the results from both this LSI study, and pertinent data from additional environmental studies, previously summarized in Chapter 3.

The following Section summarizes the chemicals detected in, 1) the shallow soils, 2) the background samples, and 3) the groundwater and surface water.

6.1 Summary of Chemicals Detected in Shallow Soil Samples

6.1.1 PCBs

The distribution of PCBs detected in soil samples collected during this LSI and from previous environmental investigations ranged from ND (detection limit was 20 ug/kg) to 48,000 ug/kg. The range of PCB 1254 (on a wet weight basis) detected in the soil samples collected during this LSI from the surface to 1.0 foot bgs and 1.0 to 2.0 feet bgs is as follows:

Study Areas	PCB 1254 ug/kg 0 to 1.0 foot bgs	PCB 1254 ug/kg 1.0 to 2.0 feet bgs
N218, N227, N255, N267, T350:	ND - 730	ND - 43
open storm drain:	ND - 4,500	ND - 1000
marsh:	ND - 1,400	ND - 38
retention pond:	ND - 3,200	ND
FSDA:	ND - 710	ND - 310
Stevens Creek:	ND - 43	ND - 22
background:	ND - 49	ND

The highest concentrations of PCB 1254 found during this LSI were detected in soil samples collected from the open storm drain, the marsh, and the storm water retention pond areas. In contrast, the soils collected from the building areas, the former soil disposal area, and Stevens Creek contain significantly lower concentrations of PCB 1254 than in the areas surrounding the storm water drainage system.

The concentrations of PCB 1254 detected in soil samples collected below a depth of 1 foot are less than concentrations detected in the surface soils. Only four out of 121 soil samples analyzed for PCBs contained detectable levels of PCB 1254 at the deepest interval sampled, 1.5 to 2.0 feet bgs.

PCB 1254 was detected in one background sample at a concentration of 49 ug/kg. The calculated mean for PCB 1254 from the on-site background soil samples is 24 mg/kg. In the case where the concentration of an element was less than the reported detection limit, the detection limit value was used in the calculation of the mean.

In addition to PCB 1254 detected in one on-site background soil sample, PCB 1254 was also detected (at a concentration of 22 ug/kg) in soil samples collected from the two locations, off-site, in Stevens Creek.

In a San Francisco Regional Bay sediment study by the National Oceanic and Atmospheric Administration (NOAA) conducted from 1984 through 1986, PCBs were detected in sediments from all samples collected around the San Francisco Bay (NOAA, 1988). The mean concentration of PCBs in San Francisco Bay sediments was 99 parts per billion (equivalent to ug/kg) on a dry weight basis. In the South Bay, in the vicinity of the San Mateo Bridge, the mean concentration of PCBs in the surface sediments at the bay periphery was 75 ug/kg on a dry weight basis (NOAA, 1988). This is equivalent to 56 ug/kg PCB on a wet weight basis using a percent moisture of 25%, typical of that found on-site in the marsh (See Table 1). Thus, PCBs, at low concentrations, are ubiquitous in the soil and sediments in the San Francisco South Bay region, occurring in bay sediments, as well as Stevens Creek and NARC background samples.

PCB oils have been used at NARC and MFNAS in the past. Although new electrical equipment does not contain PCB oils, PCBs are currently used in older electrical equipment. There are approximately 77 transformers at NARC containing PCBs (RESI, 1991). There are no known current discharges of wastewater containing PCBs at NARC (Harrison, 1992).

6.1.2 Pesticides

Low concentrations of organochlorine pesticides, 4,4-DDT, 4,4-DDE, and 4,4-DDD, were detected in soil samples collected from the vicinity of Buildings N218, N255, N267, T350, the open storm drain, the marsh, the retention pond, former soil disposal area, Stevens Creek, and the background samples.

Out of 121 soil samples analyzed for pesticides, seven contained detectable concentrations of 4,4-DDT; 27 soil samples contained 4,4-DDE, and seven soil samples contained 4,4-DDD above detection limits. The range of concentrations of 4,4-DDT, 4,4-DDE, and 4,4-DDD, the calculated mean of the chemicals, and the calculated mean of the chemicals detected

in the background samples are listed below.

Pesticide	Range Detected	Mean	Mean Background
4,4-DDT:	ND - 530 ug/kg	12 ug/kg	6 ug/kg
4,4-DDE:	ND - 390 ug/kg	24 ug/kg	6 ug/kg
4,4-DDD:	ND - 79 ug/kg	7 ug/kg	ND

The calculated mean values are 12 ug/kg for 4,4-DDT, 24 ug/kg for 4,4-DDE, and 7 ug/kg for 4,4-DDD. In the case where the concentration of an element was less than the reported detection limit, the detection limits of 6 ug/kg for 4,4-DDT, 2 ug/kg for 4,4-DDE, and 6 ug/kg for 4,4-DDD were used in the calculations of the mean.

With the exception of the soil samples collected in the vicinity of Building N255, the majority of the soil samples that contained detectable levels of 4,4-DDT, 4,4-DDE, and 4,4-DDD were collected from the top 1.0 foot of soil.

The concentrations of 4,4-DDT and 4,4-DDE detected in the background soil samples ranged from ND to 8 ug/kg, and ND to 17 ug/kg, respectively. The mean value for 4,4-DDT and 4,4-DDE detected in the background soil samples is 6 ug/kg. 4,4-DDD was not detected in the background soil samples.

DDT is a pesticide that was widely used as an insecticide for farming, e.g., cotton and tobacco, prior to 1973. 4,4-DDT is no longer registered for general use. 4,4-DDE is a degradation product of 4,4-DDT (Sax and Lewis, 1987). 4,4-DDD is also an insecticide, and was used to control insects on crops (Sax and Lewis, 1987).

Dieldrin was detected in three soil samples collected in the vicinity of Building N255 at concentrations that ranged from 22 to 31 ug/kg. Dieldrin is a pesticide that was used mainly as an insecticide for corn (Howard, 1990). It is no longer registered for general use.

In the past, the fields north of Building N255 and building area N267 were leased for agriculture purposes. Therefore, it is not surprising that these persistent pesticides, commonly used in farming before the 1970's, were detected at low, residual concentrations in most of the soil areas sampled.

NARC property is no longer leased for farming. Currently, NARC does not use or store pesticides on site (CTRI/CTRI/CDMI, 1991).

6.1.3 VOCs

The results of this LSI shallow soil sampling and previous environmental investigations suggest that VOCs do not represent an environmental concern in shallow soils at NARC.

No chlorinated VOCs were detected in shallow soil samples. The only VOC detected in the shallow soil was acetone. Surface soil sample, 227-H003-0.5, had a concentration of 1,700 ug/kg of acetone. Surface soil sample, SB-227-1, collected approximately 100 feet to the south, did not contain any VOCs above the detection limit.

The area in which soil samples 227-H003-0.5 and SB-227-1 were collected, is currently being used to store barrels of acetone. Samples were not collected at depths greater than 1.0 foot bgs due to the presence of a high pressure pipe in that area.

6.1.4 SVOCs

The results of this LSI shallow soil sampling and previous environmental investigations suggest that SVOCs do not represent an environmental concern in shallow soil at NARC. Butyl benzyl phthalate was detected in one surface soil sample, DC-S004-0.5, at a concentration of 280 ug/kg. Butyl benzyl phthalate is not known to have been used at NARC. It was commonly used as a plasticizer, primarily in polyvinyl chloride before 1978, and is frequently detected in plastics (Howard, 1990).

PNAs were detected at low concentrations in soil samples collected off-site, in the Stevens Creek outfall area. These chemicals include: benzofluoranthene, benzoperylene, benzopyrene, fluoranthene, indenopyrene, and pyrene. PNAs were detected in soil samples collected upstream (south) of the NARC outfall pump, and downstream (north) of the outfall pump. The maximum concentration of PNAs was 210 ug/kg (benzofluoranthene) detected in sediment sample SC-H003-0.5, upstream of the outfall pump.

Stevens Creek drains a water shed of approximately 39 miles of the Santa Clara Valley into the San Francisco Bay (RESI, 1991). The Regional Water Quality Control Board (RWQCB), San Francisco Bay Region, has ranked the South Bay as having the highest potential within the San Francisco Bay Region for severe water quality problems related to urban runoff (RESI, 1991). Therefore, it is not surprising that the sediments analyzed from Stevens Creek had low, but detectable levels of SVOCs chemicals that are typical in urban water runoff.

6.1.5 Lead

One hundred twenty-seven soil samples were analyzed for Pb during this LSI. Concentrations of Pb detected in shallow soil samples during this LSI and previous environmental investigations ranged from 1 to 680 mg/kg. The range of Pb (on a wet weight basis) detected in the soil samples collected during this LSI from the surface to 1.0 foot bgs and 1.0 to 2.0 feet bgs at NARC is as follows:

Study Areas	Pb mg/kg 0 to 1.0 foot bgs	Pb mg/kg 1.0 to 2.0 feet bgs
N218, N227, N255, N267, T350:	2 - 380	1 - 11
open storm drain:	14 - 86	3 - 8
marsh:	7 - 190	6 - 9
retention pond:	5 - 220	2 - 15
FSDA:	5 - 40	10 - 29
Stevens Creek:	7 - 17	8 - 13
background:	5 - 17	4 - 8

The highest concentrations of Pb were detected in the soil samples collected from the first foot of soil bgs in the vicinity of Building N218, the open storm drain area, the marsh, and the retention pond.

Soil samples collected at a depth greater than 1 foot bgs have Pb concentrations similar to the concentration of Pb detected in the on-site background soil samples. The calculated mean for Pb from the on-site background soil samples is 9 mg/kg (See Section 5.5).

In a San Francisco Regional Bay sediment study by the National Oceanic and Atmospheric Administration (NOAA) conducted from 1984 through 1986, Pb was analyzed in sediments collected from the periphery of San Francisco Bay (NOAA, 1988). Based on more than 1,300 samples collected, the mean concentration of Pb in San Francisco Bay sediments was 56 parts per million (equivalent to mg/kg) on a dry weight basis (NOAA, 1988). This is equivalent to 42 mg/kg Pb on a wet weight basis using a percent moisture of 25%, typical of that found on-site in the marsh (See Table 1). In the South Bay area, the mean concentration of Pb in the surface periphery sediments collected in 1970 was 155 mg/kg (on a dry weight basis) (NOAA, 1988).

On a dry weight basis, the Pb values from this LSI ranged from 1 to 449 mg/kg (1 to 380 mg/kg on a wet weight basis). Dry weight concentrations were calculated using moisture contents measured individually for each soil sample (See Table 1). Most of the concentrations of Pb detected in soil samples collected during this LSI are not significantly

elevated compared to the mean concentration of Pb (155 mg/kg) detected in the San Francisco South Bay sediments. However, several samples obtained in the storm drain area appear to have Pb above local background concentrations.

At NARC, Pb is currently present in paint that was previously used on buildings and as primer coating. When Pb-based paint is removed from NARC structures, environmental control measures are instigated to prevent Pb from entering into the soil or groundwater (RESI, 1991).

6.1.6 Mercury

One hundred twenty-seven soil samples were analyzed for Hg during this LSI. Concentrations of Hg detected in soil samples collected from this LSI and previous investigations ranged from 0.01 to 0.86 mg/kg. The range of Hg (on a wet weight basis) detected in the soil samples collected during this LSI from the surface to 1.0 foot bgs and 1.0 to 2.0 feet bgs at NARC is as follows:

Study Areas	Hg mg/kg 0 to 1.0 foot bgs	Hg mg/kg 1.0 to 2.0 feet bgs
N218, N227, N255, N267, T350:	0.01 - 0.41	0.01 - 0.09
open storm drain:	0.03 - 0.44	0.03 - 0.48
marsh:	0.03 - 0.75	0.02 - 0.03
retention pond:	0.02 - 0.45	0.02 - 0.26
FSDA:	0.07 - 0.20	0.08 - 0.26
Stevens Creek:	0.07 - 0.17	0.09 - 0.20
background:	0.05 - 0.09	0.02 - 0.09

Except for one soil sample from the open storm drain area, the highest concentrations of Hg were detected in the soil samples collected from the first foot of soil bgs in the open storm drain area, the marsh, and the retention pond. In contrast, the Hg concentrations of soil samples collected from the first foot bgs in the building areas, the former soil disposal area, and Stevens Creek do not have elevated Hg values compared to the on-site background samples.

Soil samples collected at depths greater than 1 foot bgs have Hg concentrations similar to the concentrations of Hg detected in the background soil samples. The calculated mean for Hg from the on-site background soil samples is 0.06 mg/kg.

In a San Francisco Regional Bay sediment study by the National Oceanic and Atmospheric Administration (NOAA) conducted from 1984 through 1986, Hg was analyzed in sediments collected from the perimeter of San Francisco Bay

(NOAA, 1988). Based on more than 1,000 samples collected, the mean concentration of Hg in San Francisco Bay sediments was 0.50 parts per million (equivalent to mg/kg) on a dry weight basis (NOAA, 1988). In the South Bay area, the mean concentration of Hg in the surface periphery sediments collected in 1970 was 0.66 mg/kg (on a dry weight basis) (NOAA, 1988).

On a dry weight basis, the Hg values from this LSI ranged from 0.01 to 0.59 mg/kg (0.01 to 0.48 mg/kg on a wet weight basis). Dry weight concentrations were calculated using moisture contents measured individually for each soil sample (See Table 1). The concentrations of Hg detected in soil samples collected during this LSI are below the mean concentration of Hg (0.66 mg/kg) detected in the San Francisco South Bay sediments by NOAA.

Hg is used in laboratory equipment in conjunction with research activities at NARC (e.g., manometers, confined vacuum pumps, thermometers).

6.1.7 EPA Priority Pollutant Metals

The average concentrations of other EPA Priority Pollutant Metals (Sb, As, Be, Cd, Cr, Cu, Ni, Se, Ag, Tl, and Zn) detected in the former soil disposal area are similar in magnitude to the average levels measured in the background soil samples from the marsh (Table 2).

In previous investigations, soil samples from the open storm drain area, the marsh, and the retention pond were analyzed for EPA Priority Pollutant Metals (EBASCO, 1989; CWMI, 1992). The concentrations of Priority Pollutant Metals measured in soil samples during those investigations do not significantly differ from the average background levels measured in soil samples from the marsh during this LSI. Therefore, the Priority Pollutant Metals (Sb, As, Be, Cd, Cr, Cu, Ni, Se, Ag, Tl, and Zn) do not appear to be an environmental problem at NARC.

6.2 Field Duplicate Soil Samples

Reproducibility between the field duplicate soil samples was poor. This underscores the heterogeneous nature of the chemical composition of soils, even soils in close proximity to each other. The most extreme example of this disparity can be demonstrated by comparing soil sample RP-H004-0.5 and the field duplicate collected at the same depth, but 2 inches apart, sample RP-H005-0.5. The PCB 1254 concentration detected in the field duplicate sample was 3,200 ug/kg; whereas, the initial sample, RP-H004-0.5 did not contain detectable concentrations of PCB 1254.

In order to verify the initial results, analysis by EPA Method 8080 was re-run on new alioquats from the original soil samples collected. For the second analysis, the concentration of PCB 1254 detected in the repeated sample RP-H004-0.5 was ND. The repeated sample, RP-H005-0.5 measured 7,300 ug/kg. The laboratory analyses from re-run samples are in Appendix B.

6.3 Summary of Groundwater and Surface Water Data

No surface water or groundwater samples were collected as part of this LSI.

As mentioned in Section 3.3, chlorinated solvents have been detected in the shallow groundwater beneath the NARC facility (EBASCO, 1989). Chlorinated solvents were not detected in the laboratory analysis of the overlying soils (EBASCO, 1989). The chlorinated chemicals that were detected in the shallow groundwater are chemicals that have been identified as constituents of the MEW Superfund Site and the NAVY Superfund Site groundwater plumes that are migrating from an off-site source area, upgradient to the south, of the NARC facility (RFAI, 1991; Kleinfelder Inc., 1992; Olliges, 1992).

The surface water samples previously collected in the open storm drain, and the retention pond in June and November, 1988, had non-detectable levels of PCBs, TRPH, and VOCs (Safety Specialists, Inc., 1990; EBASCO, 1989).

7.0 HAZARD RANKING SYSTEM FACTORS FOR GROUNDWATER, SURFACE WATER, SOIL, AND AIR PATHWAYS

The HRS is a scoring system used by the EPA to assess the relative environmental threat associated with potential releases of hazardous substances at sites. The HRS is the primary method used by EPA to determine whether a site is to be included on the National Priorities List (NPL).

Based on the revised HRS, the total score for NARC based on the combined groundwater, surface water, soil exposure, and air migration pathways is 15.77. The HRS score sheets and accompanying rationale are presented in Appendix C.

The following Section highlights the key factors in the revised HRS that were used in the evaluation of the groundwater, surface water, soil exposure, and air migration pathways.

7.1 Groundwater Pathway

NARC is located in the Santa Clara Valley groundwater basin (SCVWD, 1989; USGS, 1980). Unconsolidated alluvial fan deposits consisting of clays, sands, and gravels, which underly the NARC facility, form a multiple aquifer system of permeable sand layers and clay confining beds. Aquifer thickness and lithology vary (RESI, 1990). Discontinuous, often leaky aquitards result from coarse aquifer materials that are predominant in the area (SCVWD, 1989). Aquifers become thinner and lithology becomes finer-grained towards San Francisco Bay to the north. Shallow groundwater ranges from a depth of approximately 18 feet below mean sea level at the southern boundary of NARC to near sea level at the wetlands to the north (RESI, 1991).

As defined in the HRS Section 3.0.1.2.1, any site that is within a two mile radius of a documented zone where aquifers are known to be interconnected must be evaluated as if the aquifers beneath the site are interconnected. The Forebay Recharge Zone, which is located within a two mile radius of NARC, is an established interconnected aquifer system. Therefore, for the purposes of the HRS, the aquifers beneath the NARC facility are considered interconnected and are scored as one aquifer.

The shallow groundwater gradient is considered to follow topographic features, to the north and northwest (SCVWD, 1989; RFAI, 1991) There are no municipal drinking water wells downgradient from the NARC facility (Borg, 1992; Holcomb, 1992; Massee, 1992; McMaster 1992; Sandigo, 1992; USGS, 1980). The nearest municipal drinking water well is

City of Mountain View Well #18, located approximately 1 mile southwest of NARC. This well is being monitored by EPA as a result of groundwater contamination from an upgradient, off-site source (EPA, 1989).

There are three water purveyors within four miles of NARC: (1) the City of Mountain View serving a population of approximately 60,000, (2) the City of Sunnyvale serving approximately 120,000 people, and (3) the California Water Service Company serving approximately 70,000 people. All local groundwater is mixed with imported surface water before serving respective populations (CWSC, 1990; McMaster, 1992; Sandigo, 1992). There are approximately 18 active wells within a four mile radius of NARC, as shown in Table GW8c of the HRS Rationale (Appendix C).

The concentrations of chlorinated solvents detected in the shallow groundwater at the NARC facility were not applied to the scoring due to the likelihood that most of these chemicals are migrating onto NARC from upgradient, off-site sources (EPA, 1991). For the purposes of the HRS scoring, the observed release and waste characteristics values are therefore based on a chemical that has, 1) been detected in the groundwater, but is not likely to be attributable to off-site sources, and 2) has the highest HRS toxicity value among those chemicals detected in the groundwater. Benzene has the highest HRS toxicity value of any chemical detected in the groundwater samples at NARC and it is not assumed to be a major constituent of the off-site, upgradient chemical plume (EPA, 1991; RFAI, 1991). As defined in the HRS protocol, there is no indication that drinking water wells are subject to Level I and Level II contamination from the NARC facility.

7.2 Surface Water Pathway

The nearest receiving surface water body to NARC is Stevens Creek which is tributary to the San Francisco Bay. Salt evaporation ponds lie between the San Francisco Bay and the NARC facility (Photo 1). The northern border of the NARC facility is separated from the salt ponds by a series of levees. Isolated, non-tidal wetlands lie just south of the levee within the NARC facility. The NARC facility storm water retention pond lies within these wetlands. The retention pond receives runoff water from NARC and MFNAS via an open storm drain channel located at the northern end of Lindbergh Road. Water from the retention pond is isolated and cannot flow into the bay without being pumped into Stevens Creek through a Navy-operated pumping station located in the northwest corner of the retention pond. The pump is located on property owned by the Mid-Peninsula Regional Open Space District. The pump has not been

operated since 1983 (Hogan, 1992).

For the purpose of the HRS scoring, observed release values and waste characteristics values for the surface water pathway were based on the potential release of PCBs. Although the most recently collected surface water samples collected in the storm drain and the retention pond did not contain detectable levels of PCBs, there was one documented historical oil spill at NARC that may have involved PCBs. In 1987, an oil spill near Building N227 was reported, investigated, and remediated (see discussion in Section 3.4). Therefore, for the purposes of the HRS, the incident was evaluated as an observed release of PCBs, but populations were considered not to be exposed to PCBs as a result of the immediate cleanup.

There are no drinking water intakes downstream of NARC (Aquilari, 1992). Potential values for the human food chain threat category used in the HRS are based on an estimated annual commercial shrimp catch of 59,000 pounds for a 15 mile target distance (USFWS, 1981; Heib, 1992). The wetland frontage value is calculated as isolated wetlands within the NARC facility.

7.3 Soil Exposure Pathway

As a NASA research facility, the NARC is surrounded by a series of maintained fences, locked gates, guarded entrances, and levees. Security guards are posted 24 hours a day at the main entrance. The majority of facility operations are located on the southern portion of the NARC property. This area is paved and developed. The northern portion of the NARC property is largely undeveloped, parts of which have been previously leased for agriculture. Soils in this northern area are exposed. The majority of the work places and a day care center are located in the paved, southern portion of the NARC property. This LSI focused on the northern area and limited exposed soil areas in the southern areas.

For the purposes of the HRS scoring, the observed release and waste characteristics values are based on the one chemical, PCBs, that has, 1) been detected in the shallow soil, and 2) has the highest HRS toxicity value among those chemicals detected in the shallow soil. PCBs were detected in the shallow soils primarily in the storm drain area (open storm drain area, the northeastern end of the marsh, and the southern area of the retention pond near where the storm water flows).

The concentration of PCB 1254 detected in the soil samples collected from the Day Care Center range from 42 to 52

ug/kg. According to EPA scoring factors and procedures in Section 5.0 of the HRS, these PCB values are not elevated compared to the calculated mean background level of 24 ug/kg for on-site soils (See Section 6.1.1 for further discussion).

The highest concentrations of PCB 1254 were detected in the open storm drain area, the marsh, and the retention pond. These areas are located more than 200 feet from the Day Care Center or any work places.

For HRS purposes, the observed release values and waste characteristics values for the soil exposure pathway are based on detected concentrations of PCBs. However, it does not appear that resident individuals (workers) are subject to Level I and Level II concentrations. Due to the security of NARC, there are no areas of observed shallow soil contamination that are accessible to nearby individuals or residents.

7.4 Air Migration Pathway

NARC is located in both a military and industrial work area, surrounded by commercial and residential neighborhoods. Approximately 35,000 people live within a 1 mile radius, and 175,000 people are estimated to live within a 4 miles radius of the NARC facility.

Wetlands within the four mile target distance limit are known to be used by the California Clapper Rail, Peregrine Falcon, California Least Tern, the Salt Marsh Harvest Mouse and Common Yellowthroat (status under review)(USFWS, 1981; CTRI/CTRI/CDMI, 1991; Olliges, 1992). Additional sensitive environments within the four mile target distance limit include the San Francisco Bay National Wildlife Refuge. Greater than 500 acres of wetland are estimated to lie within a 4 mile radius of the NARC facility (USGS, 1980).

For the purposes of scoring the Air Migration Pathway, there is no documentation to support an observed release in the likelihood of release category. Therefore, the likelihood of release category is evaluated based only on a potential to release factor. Waste characteristics values are based on the highest value of all chemical sources that are potentially available to the air pathway. Therefore, at NARC, the highest value is based on the PCB concentrations detected in the exposed shallow soil. The target category is scored on the potential contamination factor as no evidence exists to suggest that populations are exposed to Level I or Level II contamination.

7.5 HRS Result

A HRS site ranking has been generated for NARC using the factors highlighted in the above Sections. The HRS score sheets and an accompanying rationale are presented in Appendix C.

The combined HRS score for the groundwater, surface water, soil exposure, and air migration pathways is 15.77. This number is below the cutoff score of 28.5 used by EPA to determine whether a site should be placed on the NPL.

8.0 CONCLUSIONS

The primary objective of this LSI investigation was to generate a HRS site ranking using the revised HRS (EPA, 1990). In addition, chemical data from shallow soils were obtained in areas specified by NARC that may potentially be impacted by chemicals of concern. These new data and previously obtained data were used in the soil exposure pathway section of the HRS.

The combined HRS score for the groundwater, surface water, soil exposure, and air migration pathways is 15.77. This number is below the cutoff score of 28.5 used by EPA to determine whether a site should be place on the NPL.

Soil samples were analyzed for PCBs and organochlorine pesticides, VOCs, SVOCs, Pb, Hg, and the following additional EPA Priority Pollutant Metals: Sb, As, Be, Cd, Cr, Cu, Ni, Se, Ag, Tl, and Zn. On the basis of the shallow soil data collected in this LSI the following conclusions can be made:

- The highest concentrations of PCBs were detected in the first foot of soil collected in the open storm drain area, the marsh, and the retention pond. These areas constitute the storm water drainage system which handles runoff from NARC and portions of Moffett Field Naval Air Station. PCBs detected in this drainage appear to represent historic releases of PCB-containing oils.

- VOCs and SVOCs do not appear to represent an environmental problem in the shallow soils at NARC.

- Organochlorine pesticides were detected in low concentrations in most of the soil areas sampled at NARC. The concentrations of organochlorine pesticides were not significantly elevated compared to the levels detected in the on-site background samples.

- Pb and Hg were detected in some locations at elevated concentrations compared to Pb and Hg levels detected in on-site background samples (See Table 1). In most cases, the concentrations of Pb and Hg detected in the shallow soils at NARC are not significantly elevated compared to the mean concentrations of Pb and Hg detected in the San Francisco Bay sediments. However, several samples collected in the storm water drainage system, and one sample collected near Building N218 appear to have Pb above local background concentrations.

- The average concentration of other EPA Priority Pollutant Metals (Sb, As, Be, Cd, Cr, Cu, Ni, Se, Ag, Tl, and Zn) detected in soil samples from NARC are similar in magnitude to the average concentrations measured in the background soil samples collected from the marsh (See Table 2).

9.0 REFERENCES

Aguilari, Joe, Santa Clara Valley Water District, and Swillinger, Timothy, Erler & Kalinowski, Inc. Telephone conversation. 9 April 1992.

Borg, Charles, City of Palo Alto, and Swillinger, Timothy, Erler & Kalinowski, Inc. Telephone conversation. 9 April 1992.

California Water Service Company. 1990 Water Management Plan, Los Altos Suburban District. 1990.

Chemical Waste Management, Inc. Final Phase I and Phase II Subsurface Investigations Site N267. December 1990.

Chemical Waste Management, Inc. Analysis of Wetland Soil Samples. NAS2-13173, February 1992.

Contract Technical Resources, Inc. and Camp, Dresser, and McKee, Inc. Draft Environmental Resources Document for NASA-Ames Research Center, Moffett Field, California. June 1991.

EBASCO Services, Inc. Preliminary Assessment Report for Nasa Ames Research Center, Moffett Field, California, NAS2-4301, April 1988.

EBASCO Services, Inc. NASA Site Inspection Report, National Aeronautics and Space Administration, Ames Research Center. April 1989.

Erler & Kalinowski, Inc. Listing Site Inspection Work Plan for NASA Ames Research Center, Moffett Field, California. NAS2-13546, March 1992.

Harrison, Marla, NASA Ames Research Center, and Kersting, Annie, Erler & Kalinowski, Inc. Telephone conversation. 13 May 1992.

Heib, Kathy, California Department of Fish and Game, and Swillinger, Timothy, Erler & Kalinowski, Inc. Telephone conversation. 9 April 1992.

Hogan, Patrick, NASA Ames Research Center, and Kersting, Annie, Erler & Kalinowski, Inc. Telephone conversation. 21 April 1992.

Holcomb, Ken, City of Los Altos, and Swillinger, Timothy, Erler & Kalinowski, Inc. Telephone conversation. 9 April 1992.

Howard, P.H. Handbook of Environmental Fate and Exposure

Data for Organic Chemicals. Lewis Publishers. Chelsea, Michigan. Vol. II Solvents. 1990.

Kleinfelder, Inc. Report of Findings of a Subsurface Investigation of Potential Solvent Contamination at the N245, E182, OARF, and VTOL Sites, NASA-Ames Research Center Moffett Field, California. January 1992.

Massee, Donald. City of Santa Clara Water Department, and Swillinger, Timothy, Erler & Kalinowski, Inc. Telephone conversation. 9 April 1992.

McMaster, Mike, City of Mountain View, and Swillinger, Timothy, Erler & Kalinowski, Inc. Telephone conversation. 10 April 1992.

National Oceanic and Atmospheric Administration. Status and Trends in Concentrations of Contaminants and Measures of Biological Stress in San Francisco Bay, Seattle Washington, May 1988.

Olliges, Sandy, NASA Ames Research Center, and Donald White, Environmental Protection Agency. Letter dated 30 October 1990.

Olliges, Sandy, NASA Ames Research Center, and Douglas, Carolyn, Environmental Protection Agency. Letter dated 31 March 1992.

Olliges, Sandy, NASA Ames Research Center, and Swillinger, Timothy, Erler & Kalinowski, Inc. Telephone conversation. 10 April 1992.

Roger Foott Associates, Inc. Remedial Investigation National Full-Scale Aerodynamics Complex, NASA-Ames Research Center, Moffett Field, California. June 1991.

Riedel Environmental Services, Inc. Subsurface Hydrogeological Investigation, NASA-Ames Research Center, Moffett Field, California. November 1990.

Riedel Environmental Services, Inc. Subsurface Hydrogeologic Investigation NASA-Ames Research Center, Moffett Field, California. October 1991.

Safety Specialists, Inc. Progress Report: Emergency - Oil Spill, Response - Containment - Clean Up and Laboratory Analysis of Water, Oil and Soil. NAS2-11932/87-364, January 1988.

Safety Specialists, Inc. Progress Report on Work Performed in the Area of the Oil/Water Separator at the North End of Lindbergh Ave. NAS2-11932/87-490, July 1988.

Safety Specialists, Inc. Disposal Report on Excavated Soil in the Area of the Oil/Water Separator at the North End of Lindbergh Avenue and Excavated Soil and Gravel at N227D. NAS2-11932/87-490, September 1988.

Safety Specialists, Inc. Soil Sample Collection for Horizontal and Vertical Definition of Marsh Contamination. NAS2-11932/87-399, February 1989.

Safety Specialists, Inc. Bioremediation of Soil Contaminated with Waste Oil at Navarro Farms. NAS2-11932/89-127, January 1990.

Safety Specialists, Inc. Sampling from Open Storm Drain off Linbergh Road. NAS2-11932/88-1, January 1990.

Sandigo, Alex, City of Sunnyvale, and Swillinger, Timothy, Erler & Kalinowski, Inc. Telephone conversation. 9 April 1992.

Santa Clara Valley Water District. Standards for the Construction and Destruction of Wells and Other Deep Excavations in Santa Clara County. June 1989.

Sax, N.I. and Lewis, R. J. Hawley's Condensed Chemical Dictionary, 11th Ed. Van Nostrand Reinhold Co. N.Y., 1987.

U.S. Environmental Protection Agency. Middlefield-Ellis-Whisman, MEW Study Area. Mountain View, California July 1989.

U.S. Environmental Protection Agency, Part II, Hazard Ranking System; Final Rule. 40 CFR Part 300 (FRL-3730-8) RIN 2050 AB73, December 1990.

U.S. Environmental Protection Agency. Middlefield-Ellis-Whisman (MEW) Study Area Fact Sheet #3. Mountain View, California May 1991.

U.S. Fish and Wildlife Service. Pacific Coast Ecological Inventory, San Francisco Quadrangle. 1981.

U.S. Geological Survey. Cupertino, Milpitas, Mountain View, and Palo Alto Quadrangles, California. 7.5-minute series, topographic. 1961, photorevised 1980.

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Photo #1: Bldg. N265. Accumulation yard
Two locked metal cabinets outside of the yard for HWs and PCB's. The HW's cabinet was empty.

Photo #2: Bldg. N265. Accumulation yard
Entrance with security fencing & caution signs. Note safety response materials and equipment.

THE HAZARDOUS SUBSTANCE TRANSFER SITE, Bldg. N265
NASA-ARC, CEI, 4/11/96; Photographer-Molly Measer

THE HAZARDOUS SUBSTANCE TRANSFER SITE, Bldg. N265
NASA-ARC, CEI, 4/11/96; Photographer-Molly Measer

Photo #3: Bldg. N265. Accumulation yard
Aisle spacing and separation by chemical types is maintained with painted lines.

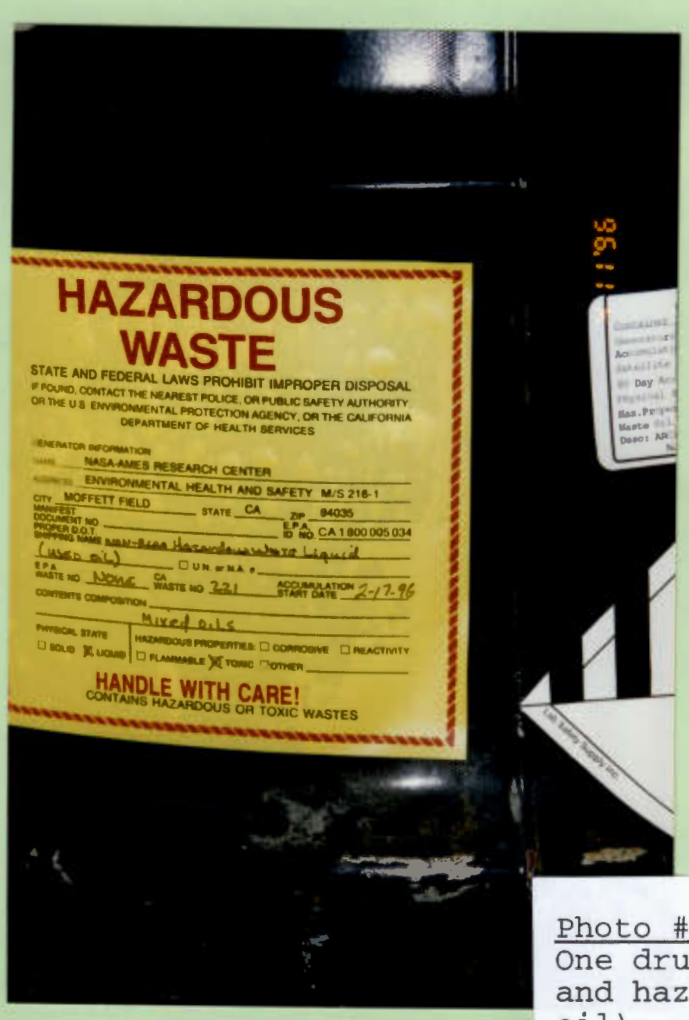
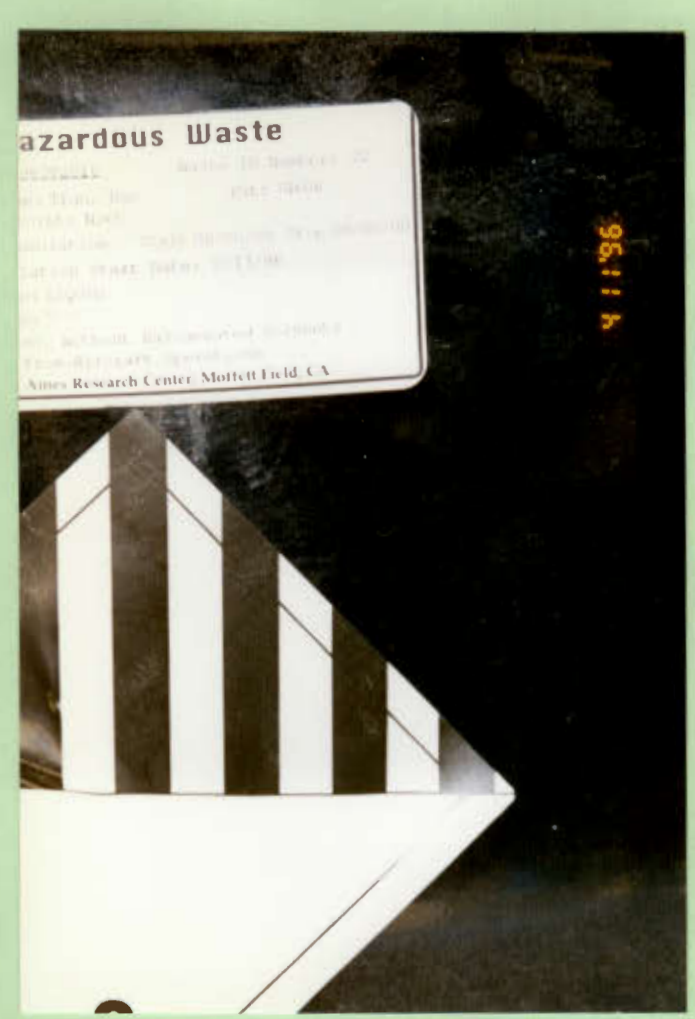


Photo #4: Bldg. N265. Accumulation yard
One drum of oil with conflicting U.S. DOT and hazardous waste labels (waste or used oil).

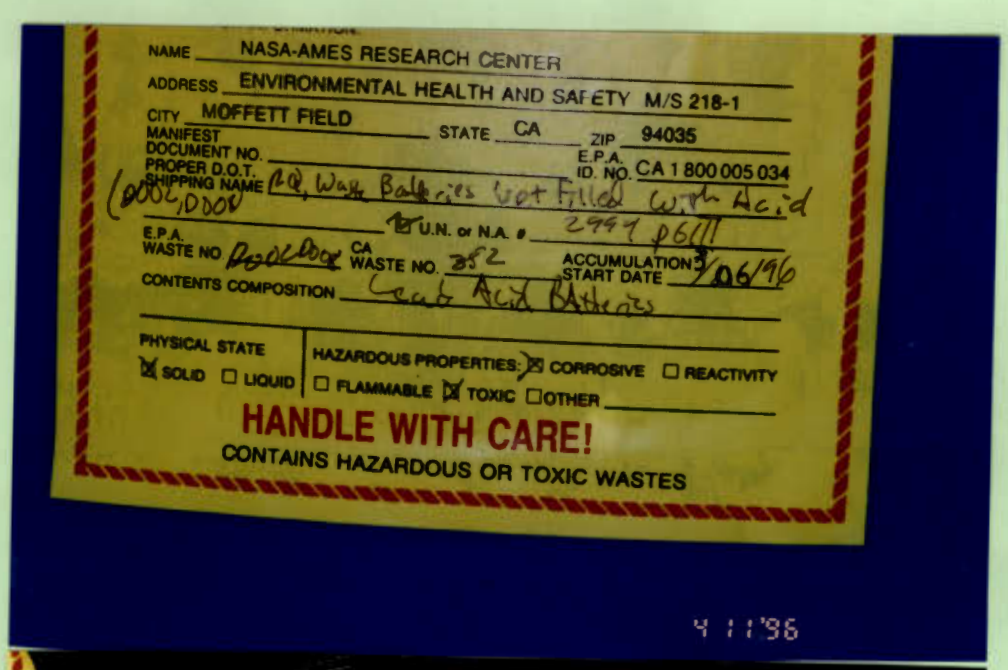


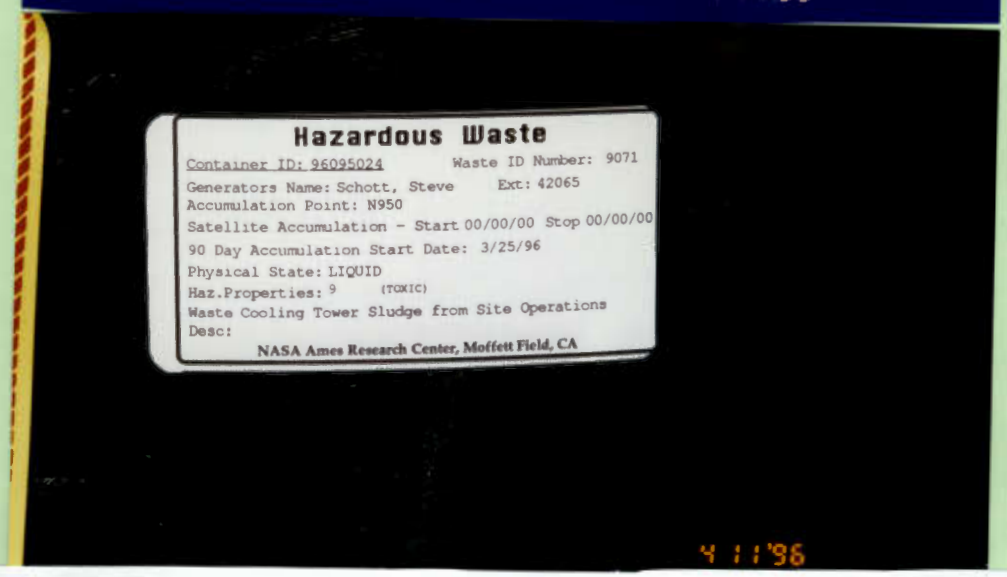
Photos #5 & 6: Bldg. N265. Accumulation yard
Close-up of other labels on Drum in #4, handler checked records and corrected label.

THE HAZARDOUS SUBSTANCE TRANSFER SITE, Bldg. N265
NASA-ARC, CEI, 4/11/96; Photographer-Molly Measer

THE HAZARDOUS SUBSTANCE TRANSFER SITE, Bldg. N265
NASA-ARC, CEI, 4/11/96; Photographer-Molly Measer

Photos #7 & 8: Bldg. N265. Accumulation yard
Variety of containers. Eye wash and shower in consolidating area behind Triwall cartons (see yellow arrow). Water source indicated with white arrow and a hydrant is out front.





Bldg. N265. Accumulation yard
Photo #9: Label for Labpack (batteries filled with acid).
#10: Computer-generated label based on data from turn-in form (Cooling Tower Sludge).
#11: Metal cabinets were empty or held little.

THE HAZARDOUS SUBSTANCE TRANSFER SITE, Bldg. N265
NASA-ARC, CEI, 4/11/96; Photographer-Molly Measer

THE HAZARDOUS SUBSTANCE TRANSFER SITE, Bldg. N265
NASA-ARC, CEI, 4/11/96; Photographer-Molly Measer

Photos #12-15: Bldg. N265. Accumulation yard
Evergreen took a composite sample and analyzed it before vacuuming out the drums.

FLIGHT SUPPORT FACILITY, Bldg. 211
NASA-ARC, CEI, 4/11/96; Photographer-Molly Measer

Accumulation Log

Physical State: ☐ Liquid ☐ Solid ☐ Gas
Hazardous Properties: ☐ Corrosive ☒ Toxic ☐ Reactive
☐ Flammable ☐ Other
Generator's Name: Support
Phone: 4513 M/S: 211-1 Org. Code: OPR
Accumulation Point: Bldg: 211 Room: 100
Satellite Accumulation Start Date:
Satellite Accumulation Stop Date:
90 Day Accumulation Start Date: 10 Apr 96

Waste Component(s)	Percent(s)
Absorbent Material	
Acft Hyd. Fluid	
Acft Engine oil	

NASA Ames Research Center Moffett Field CA ARC #AB-2 (Dec 92)

4 11 96

Physical State: ☐ Liquid ☐ Solid
Hazardous Properties: ☐ Corrosive ☐ Toxic ☐ Reactive
☐ Flammable ☐ Other
Generator's Name: Flight
Phone: 4513 M/S: 211-1 Org. Code: OPR
Accumulation Point: Bldg: 211 Room: 100
Satellite Accumulation Start Date:
Satellite Accumulation Stop Date:
90 Day Accumulation Start Date: 10 Apr 96

Waste Component(s)	Percent(s)
Absorbent Material	
Acft Engine oil	
Acft Hyd. Fluid	

NASA Ames Research Center Moffett Field CA ARC #AB-2 (Dec 92)

4 11 96

Photos 16-19: Flight Support (Hangar) Bldg. 211
Two drums labelled to accumulate "absorbent materials" (rags with engine oil or hydraulic fluid.) One was empty and the other held only a few lightly stained rags. MSDS were available.

RESEARCH LABORATORY, Bldg. 239, Room 318
NASA-ARC, CEI, 4/11/96; Photographer-Molly Measer

Photos 20 & 21: Research Laboratory, Bldg. 239, Room 318. Liquid wastes accumulating under the sink included mercuric chloride and phosphoric acid.

E

Discharge to POTWs

Sample #: 6905

CITY OF SUNNYVALE WATER POLLUTION CONTROL PLANT
P.O. BOX 3707, SUNNYVALE, CA 94086-3707

Name: NASA AMES RESEARCH CENTER
Address: M/S 218-1 MOFFETT FIELD CA
ID: 01430 Inspector: R

Sample Date: 1/18/96
Time: 11:00 AM
Day: TH

Sample Pt: SEE NOTE BELOW

Method: GRAB
Type:

Sampler Set By:
Sample(r) Collected By: RG
Sample Preparation By: RG

Auto Sampler Mode-Time: #Samples/Bottles: Interval:
Comments:

SAMPLE ANALYSIS (ALL RESULTS IN MG/L UNLESS OTHERWISE SPECIFIED)

METALS

	Results	Detection Limit
Antimony(Sb):		
Arsenic(As):		
Beryllium(Be):		
Cadmium(Cd):	ND	.0500
Chromium(Cr):	ND	.2500
Cobalt(Co):		
Copper(Cu):	ND	.2000
Lead(Pb):	ND	.3000
Mercury(Hg):		
Nickel(Ni):	0.004	.0030
Selenium(Se):		
Silver(Ag):	ND	.1000
Sodium(Na):		
Zinc(Zn):	ND	.0500

DISCRETE pH

Bottle#	pH	Bottle#	pH
1:		13:	
2:		14:	
3:		15:	
4:		16:	
5:		17:	
6:		18:	
7:		19:	
8:		20:	
9:		21:	
10:		22:	
11:		23:	
12:		24:	

+pH Recorder Set:

GENERAL/REVENUE/OTHER ANALYSES

	Results		Results	Detection Limit
pH:	7.1	Phenols:	*ND	.0500
Temperature:		Cyanide:		
+EPA Method 8010/8020:	*ND	Oil/Grease:		
+EPA Method 8240:		Flouride:		
+EPA Method 8270:		NH3-N:		
TOC:		Suspended Solids:		
COD:		Other:		

Comments: SAMPLES TAKEN FROM SAMPLE PORT AFTER CARBON TREATMENT OF THE GROUNDWATER REMEDIATION SYSTEM AT THE TANK FARM.- RG

Contract Lab Results: 2/21/96

Signed Off By: DIANE IDEMOTO

Sign Off Date: 1/31/96

NA: Not Applicable
ND: Not Detected
LA: Lost Analysis
+ : Detailed results attached.
* : Analysis results from contract laboratory.

"P" prefixed number indicates results pending from a contract laboratory.

The parameters highlighted above were analyzed to assess your facility's compliance with SMC Section 12.12.120. No violations for those parameters were detected.

Robert J. Gallo

Robert Gallo
Industrial Waste Inspector
(408)730-7737

THIS COMPLETES THE ANALYSIS FOR THIS SAMPLE

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

City of Sunnyvale	Client Proj. ID: Lab Page #0248	Sampled: 01/18/96
1444 Borregas Avenue	Sample Descript: P5466-6905-IW	Received: 01/24/96
Sunnyvale, CA 94089	Matrix: LIQUID	
	Analysis Method: EPA 8010	Analyzed: 02/01/96
Attention: Rosanna Lacarra	Lab Number: 9601F88-13	Reported: 02/09/96

QC Batch Number: GC013096801024A
Instrument ID: GCHP24

Halogenated Volatile Organics (EPA 8010)

Analyte	Detection Limit ug/L	Sample Results ug/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon Tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

Surrogates	Control Limits %		% Recovery
1-Chloro-2-fluorobenzene	70	130	92

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

RECEIVED
FEB 14 1996
W.P.C.P.

Nellie Lane
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

City of Sunnyvale	Client Proj. ID: Lab Page #0248	Sampled: 01/18/96
1444 Borregas Avenue	Sample Descript: P5466-6905-IW	Received: 01/24/96
Sunnyvale, CA 94089	Matrix: LIQUID	
	Analysis Method: EPA 8020	Analyzed: 02/01/96
Attention: Rosanna Lacarra	Lab Number: 9601F88-13	Reported: 02/09/96

QC Batch Number: GC013096802024A
Instrument ID: GCHP24

Aromatic Volatile Organics (EPA 8020)

Analyte	Detection Limit ug/L	Sample Results ug/L
Benzene	0.50	N.D.
Chlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
Ethyl benzene	0.50	N.D.
Toluene	0.50	N.D.
Total Xylenes	0.50	N.D.

Surrogates	Control Limits %		% Recovery
1-Chloro-2-fluorobenzene	70	130	98

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Noelle Lane
Project Manager

RECEIVED
FEB 14 1996
W.P.C.P.

F

Biennial Report

96-5047-4816

TO: Steven G. Brisbin, COTR
Safety, Health and Environmental Services
NASA Ames Research Center
Moffett Field, California 94035

FROM: Ceil McCloy, Project Manager Date: 2-26-96
Science Applications International Corporation

CONTRACT NO.: NAS2-14198

REPORT TITLE: 1995 Hazardous Waste Report (Biennial Report)

TASK NUMBER: N/A

LOCATIONS: Moffett Federal Airfield

NASA CONTACT: Diane Shelander, Code DQH

INVESTIGATORS: Dr. Peter Yimbo, Dan Winningham, Rich Kelly, and Mark Lacy

FIELD DATE: February 1996

FINAL REPORT: February 15, 1996

REVIEWED BY: Peter O. Yimbo — 2-26-96
Dr. Peter Yimbo — Date

DISTRIBUTION:
Diane Shelander, NASA
Sandy Olliges, NASA
Peter Yimbo, SAIC
Dan Winningham, Laidlaw
Central Files

National Aeronautics and
Space Administration
Ames Research Center
Moffett Field, CA 94035-1000

2 8 FEB 1996

DQH:218-1

Reply to Attn of:

California Department of Toxic Substances Control
P. O. Box 806
Sacramento, CA 95812-0806

Biennial Report Staff:

NASA Ames Research Center is pleased to submit the enclosed 1995 Hazardous Waste Report (Biennial Report). This report is being submitted in accordance with Sections 3002 and 3004 of the Resource Conservation and Recovery Act (RCRA) of 1976 as amended by the Hazardous and Solid Waste Amendments (HSWA) of 1984.

During the preparation of this Biennial Report, NASA Ames followed all the instructions provided by the US Environmental Protection Agency (US EPA) and California Environmental Protection Agency (Cal EPA). We also considered the State of California biennial reporting requirements found in Title 22, California Code of Regulations (CCR), Division 4.5. The specific Federal and State standards for generators applicable to NASA are found in 40 Code of Federal Regulations (CFR), Part 262.1 and Title 22 CCR, Section 66262.41, respectively.

If you have any questions regarding this report, please contact Diane Shelander at (415) 604-0921.

Sincerely,

Clifford N. Burrous
Deputy Chief
Safety, Reliability, and Quality Assurance

Enclosure

1995 HAZARDOUS WASTE REPORT (BIENNIAL REPORT)

Prepared by:

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
NASA-Ames Research Center
M/S 19-21
Moffett Field, California 94035-1000

February 28, 1996

An Employee Owned Company

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U. S. NASA Ames Research Center Moffett Field, CA 94035-1000

EPA ID NO: CA1 800 005 034

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM IC

IDENTIFICATION AND CERTIFICATION

INSTRUCTIONS: Read the detailed instructions beginning on page 9 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Site name and location address. Complete A through H. Check the box ☐ in items A, C, E, F, G, and H if same as label; if different, enter corrections. If label is absent, enter information. Instruction page 10.

A. EPA ID No. Same as label ☐ or → CA1 800 005 034	B. County Santa Clara County
C. Site/company name Same as label ☐ or → U. S. NASA Ames Research Center	D. Has the site name associated with this EPA ID changed since 1993? ☐ 1 Yes ☒ 2 No

E. Street name and number. If not applicable, enter industrial park, building name, or other physical location description.
Same as label ☐ or → Safety Office

F. City, town, village, etc. Same as label ☐ or → Moffett Field	G. State Same as label CA	H. Zip Code Same as label 94035-1000

Sec. II Mailing address of site. Instruction page 10.

A. Is the mailing address the same as the location address? ☐ 1 Yes (SKIP TO SEC. III) ☒ 2 No (GO TO BOX B)

B. Number and street name of mailing address
Mail Stop 218-1

C. City, town, village, etc. Moffett Field	D. State CA	E. Zip Code 94035-1000

Sec. III Name, title, and telephone number of the person who should be contacted if questions arise regarding this report. Instruction page 10.

A. Please print: Last Name: Shelander; First name: Diane; M.I.: S.	B. Title Environmental Program Manager (Acting)	C. Telephone 415 604-0921 Extension N/A

Sec. IV "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties under Section 3008 of the Resource Conservation and Recovery Act for submitting false information, including the possibility of fine and imprisonment for knowing violations."

A. Please print: Last Name: Burrous; First name: Clifford; M.I.: N	B. Title Deputy Chief, Division
C. Signature	D. Date of signature MO. DAY YR.

EPA ID NO: CA1 800 005 034

Sec.V - Generator Status. Instruction pages 10, 12.

A. 1995 RCRA generator status (CHECK ONE BOX BELOW)	B. Reason for not generating (CHECK ALL THAT APPLY)	
☒ 1 LQG	☐ 1 Never generated	☐ 5 Periodic or occasional generator
☐ 2 SQG SKIP to SEC. VI	☐ 2 Out of business	☐ 6 Waste minimization activity
☐ 3 CESQG	☐ 3 Only excluded or delisted waste	☐ 7 Other (SPECIFY COMMENTS IN BOX BELOW)
☐ 4 Non generator (Continue to Box B)	☐ 4 Only non-hazardous waste	

Sec.VI - On-Site Waste Management Status. Instruction pages 13, 14.

A. Storage subject to RCRA permitting requirements	B. Treatment, disposal, or recycling subject to RCRA permitting requirements	C. RCRA-exempt treatment, disposal, or recycling
1	1	3

Sec.VII - Waste Minimization Activity during 1994 or 1995. Instruction pages 14, 15.

A. Did this site begin or expand a source reduction activity during 1994 or 1995?	B. Did this site begin or expand a recycling activity during 1994 or 1995?	C. Did this site systematically investigate opportunities for source reduction or recycling during 1994 or 1995?
☒ 1 Yes	☒ 1 Yes	☒ 1 Yes
☐ 2 No	☐ 2 No	☐ 2 No

D. Did any of the factors listed below delay or limit this site's ability to initiate new or additional source reduction activities in 1994 or 1995? (CHECK YES OR NO FOR EACH ITEM)

Yes	No		
☒ 1	☐ 2	a.	Insufficient capital to install new source reduction equipment or implement new source reduction practices
☐ 1	☒ 2	b.	Lack of technical information on source reduction techniques applicable to the specific production processes
☐ 1	☒ 2	c.	Source reduction is not economically feasible: cost savings in waste management or production will not recover the capital investment
☐ 1	☒ 2	d.	Concern that product quality may decline as a result of source reduction
☐ 1	☒ 2	e.	Technical limitations of the production processes
☒ 1	☐ 2	f.	Permitting burdens
☐ 1	☒ 2	g.	Source reduction previously implemented - additional reduction does not appear to be technically feasible
☐ 1	☒ 2	h.	Source reduction previously implemented - additional reduction does not appear to be economically feasible
☐ 1	☒ 2	i.	Source reduction previously implemented - additional reduction does not appear to be feasible due to permitting requirements
☐ 1	☐ 2	j.	Other (SPECIFY COMMENTS IN BOX BELOW)

E. Did any of the factors listed below delay or limit the site's ability to initiate new or additional on-site or off-site recycling activities during 1994 or 1995? (CHECK YES OR NO FOR EACH ITEM)

Yes	No		
☒ 1	☐ 2	a.	Insufficient capital to install new recycling equipment or implement new recycling practice
☐ 1	☒ 2	b.	Lack of technical information on recycling techniques applicable to this site's specific production process
☐ 1	☒ 2	c.	Recycling is not economically feasible: cost savings in waste management will not recover the capital investment
☐ 1	☒ 2	d.	Concern that product quality may decline as a result of recycling
☐ 1	☒ 2	e.	Requirements to manifest wastes inhibit shipments of off-site for recycling
☐ 1	☒ 2	f.	Financial liability provisions inhibit shipments off-site for recycling
☐ 1	☒ 2	g.	Technical limitations of production processes inhibit shipments off-site for recycling
☐ 1	☒ 2	h.	Technical limitations of production processes inhibit on-site recycling
☒ 1	☐ 2	i.	Permitting burdens inhibit recycling
☐ 1	☒ 2	j.	Lack of permitted off-site recycling facilities
☐ 1	☒ 2	k.	Unable to identify a market for recycled materials
☐ 1	☒ 2	l.	Recycling previously implemented - additional recycling does not appear to be technically feasible
☐ 1	☒ 2	m.	Recycling previously implemented - additional recycling does not appear to be economically feasible
☐ 1	☒ 2	n.	Recycling previously implemented - additional recycling does not appear to be feasible due to permitting requirements
☐ 1	☐ 2	o.	Other (SPECIFY COMMENTS IN BOX BELOW)

Comments:

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: CA11 8000 0005 0134

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Electrolyte Solution(CORROSIVE MATERIAL) from Electrolyte Removal Project
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D002	123

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type NA	A94	1	B109	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
4,400.0	73,392.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M079		73,392.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments:

FORM GM

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Misc. Non-RCRA Contaminated Debris from Site Clean-up
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	181,352

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type NA	A53	1	B409	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
107,210.0	178,222.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M132		171,086.0
Site 2	CAT080022148	M132		2,500.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments: Sec. III, Box B continued on supplemental page: 2a
Sec. I, Box H: Misc. Non-RCRA Contaminated Debris

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Misc. Non-RCRA Contaminated Debris from Site Clean-up
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	N/A		1		2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
		1 ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ☐ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD000088252	M132		3,226.0
Site 2	CAD009452657	M039		1,410.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments: Continuation from Page 2

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Moffett Field, CA 94035-1000

EPA ID NO: CA1 800 005 034

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Instruction page 18: Oil Contaminated Water from Site Operations

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	223 134

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	01 System Type NA	A54	1	B205	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
355,467.0	436,708.0	1	☐ 1 lbs/gal ☐ sg	☒ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M124	234448.0	M NA	NA.

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ☒ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD980887418	M039		80,918.0
Site 2	CAD083166728	M032		23,769.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA.	NA.	NA.

Comments:

Section I, Box F - A75 Additional Source Code
Section II, Process System Type - oil/water separation

Sec. III, Box B continued on supplemental page: 3a

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Oil Contaminated Water from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	NA		1		2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21 Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
		1 ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ☐ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M089		97,573.0
Site 2				N/A

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments: Continuation from Page 3

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - PCB Light Ballasts(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	261

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A58	1	B407	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21 / Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
5,929.0	6,556.0	1 / ___ . ___ ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	UTD991301748	M132		6,556.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments: Sec. I, Box H: PCB Light Ballasts

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EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Aerosol Spray Cans-Non Flammable(NON-FLAMMABLE GAS) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D008 D011 D006 D007 D028	741

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	01 System Type |N|A|	A58	|1|	B801	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
514.0	495.0	|1|	||||•||| ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M| |||	||||||||||•||	|M| |||	||||||||||•||

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M044	||	495.0
Site 2			||	NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A| ||||||||•||	|N|A|•||	|N|A| ||||||||•||

Comments: Section I, Box B: D029 D039 D040 U044 U075 U078 U121 U208 U209 U211 U218 U226 U228

FORM GM

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Compressed Gas Cylinder-Poison(POISON GAS) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A58	1	B701	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
35.0	90.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	TXD982560294	M044		85.0
Site 2	NYD000632372	M044		5.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

FORM GM

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U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Compressed Gas Cylinder-FG(FLAMMABLE GAS) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551,741

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A58	1	B801	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
8.0	115.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	AZD049318009	M044		115.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

'TE NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Oil, With Halogenated Solvents >1000ppm(TOXIC) from Aircraft Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D019 D040	741

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type NA	A54	1	B206	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
15,475.0	26,500.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M061		26,500.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments:

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Oil, Misc. without Halogenated Solvents from Aircraft Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	221

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A54	1	B206	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
76,694.0	153,442.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD980887418	M039		14,854.0
Site 2	CAL000048571	M039		480.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments: Sec. III, Box B continued on supplemental page: 9a

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Oil, Misc. without Halogenated Solvents from Aircraft Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	N/A		1		2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
		1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
☐ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	TXD077603371	M051		349.0
Site 2	CAD000088252	M039		1,200.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
☐ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments: Continuation from Page 9

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Oil, Misc. without Halogenated Solvents from Aircraft Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	NA		1		2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21 Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
		1 ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
☐ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M061		100,288.0
Site 2	CAD980883177	M039		36,271.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
☐ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments: Continuation from Page 9

FORM GM

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EPA ID NO: CA11 8000 0015 0134

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Gas Path Cleaner(Combustible Liquid) from Aircraft Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D006	331

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type NA	A19	1	B201	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
2,970.0	2,980.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M089		2,980.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments:

FORM GM

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Aerosol Spray Cans-Flammable(FLAMMABLE GAS) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D001 D008 D011 D035 D039	741

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A58	1	B801	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
1,965.0	2,855.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M044		2,855.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments: Section I, Box B: D040 U002 U075 U115 U154 U226

FORM GM

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EPA ID NO: CA11 8000 0015 0134

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Cooling Tower Wood Debris(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	181,352

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O2 System Type NA	A93	1	B409	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21 / Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
15,000.0	104,900.0	1 . ___ • ___ ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	UTD991301748	M132		104,900.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
NA NA NA NA	☐ 1 Yes ☐ 2 No	NA •	NA •	NA •

Comments: Sec. I, Box H: Cooling Tower Wood Debris

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Moffett Field, CA 94035-1000

EPA ID NO: CA11 8000 0015 034

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Asbestos(TOXIC) from Asbestos Removal
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	151

D. SIC code Page 19	E. Origin code 02 Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	NA	A69	1	B311	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
119,865.0	250,075.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD990794133	M132		875.0
Site 2	CAL000027741	M132		103,288.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments: Sec. III, Box B continued on supplemental page: 13a

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Moffett Field, CA 94035-1000

EPA ID NO: CA1 800 005 034

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Asbestos(TOXIC) from Asbestos Removal
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	NA		1		2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
		1	. ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M	.	M	.

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
☐ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD981388952	M132		6,065.0
Site 2	CAD982042475	M132		139,847.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
☐ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA .	NA .	NA .

Comments: Continuation from Page 13

FORM GM

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Diesel Fuel(Combustible Liquid) from Aircraft Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D001	331

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A59	1	B206	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
2,600.0	3,790.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAT080011059	M039		40.0
Site 2	CAD059494310	M061		3,750.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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EPA ID NO: CA11 8100 0015 0134

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Contaminated Naphtha Waste(FLAMMABLE LIQUID) from Aircraft Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D001 D006 D008 D018 D035	741

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9161	O1 System Type N/A	A37	1	B203	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
4,621.0	5,715.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD053044053	M029		5,715.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments: Section I, Box B: D039 D040

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EPA ID NO: CA1 800 005 034

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Paint Thinner(FLAMMABLE LIQUID) from Paint Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D001	212

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 NA	A21	1	B211	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
3,691.0	1,800.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD000088252	M039		1,800.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments:

FORM GM

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

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EPA ID NO: CA1 8000 0005 0314

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Paint, Flammable(FLAMMABLE LIQUID) from Paint Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D001 D008 D011 D018 D026	331

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type NA	A58	1	B209	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
11,990.0	12,985.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M041		12,985.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments: Section I, Box B: D035 D039 D040 F001-F005

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E NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Flammable Solvent(FLAMMABLE LIQUID) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D001 D008 D011 D018 D019	331,722

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A58	1	B204	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
14,155.0	8,035.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M061		8,035.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A / W N A / W N A / W N A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments: Section I, Box B: D027 D029 D035 D036 D040 F001-F005

FORM GM

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SITE NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - JP Jet Fuel(Combustible Liquid) from Aircraft Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D001	331

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	O1 System Type |N|A|	A58	|1|	B206	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
23,554.0	10,911.0	|1| ||||•||| ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|	||||||||||•||	|M|	||||||||||•||

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M061	||	10,911.0
Site 2			||	NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A| ||||||||•||	|N|A|•||	|N|A| ||||||||•||

Comments:

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

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Moffett Field, CA 94035-1000

EPA ID NO: CA11 8000 0055 0134

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Flammable, Poisonous(FLAMMABLE LIQUID) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A58	1	B001	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
426.0	1,276.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137		1,276.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Flammable Liquid(FLAMMABLE LIQUID) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A58	1	B001	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
3,711.0	2,682.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137		2,642.0
Site 2	ARD069748192	M137		40.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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S NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Flammable, Corrosive(FLAMMABLE LIQUID) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	O1 System Type |N|A|	A58	|1|	B001	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
534.0	331.0	|1|	||||•||| ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|	||||||||||•||	|M|	||||||||||•||

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137	||	331.0
Site 2			||	NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A| ||||||||•||	|N|A|•||	|N|A| ||||||||•||

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Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Flammable Solid(FLAMMABLE SOLID) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A58	1	B001	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
590.0	910.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137		580.0
Site 2	ARD069748192	M137		330.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Flammable Paint Solids(FLAMMABLE SOLID) from Paint Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D001 F003 F005	212

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A21	1	B209	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
1,620.0	525.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD000088252	M039		525.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A W N A W N A W N A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

FORM GM

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Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Oxidizer(OXIDIZER) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	Q1 System Type |N|A|	A58	|1|	B001	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
381.0	938.0	|1|	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|		|M|	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137		938.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A|	|N|A|	|N|A|

omments:

FORM GM

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpack-Organic Peroxide Type F, liquid(ORGANIC PEROXIDE) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A58	1	B001	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
116.0	25.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	ARD069748192	M137		25.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A W N A W N A W N A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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Moffett Field, CA 94035-1000

EPA ID NO: CA 1 8 0 0 0 5 0 3 4

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Calfran Photo Waste(TOXIC) from Photo Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D011	541

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9 6 6 1	Q1 System Type N A	A72	1	B114	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
55,600.0	92,045.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M041		92,045.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A W N A W N A W N A	☐ 1 Yes ☐ 2 No	N A	N A	N A

Comments:

FORM CM

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Moffett Field, CA 94035-1000

EPA ID NO: CA11 8000 0055 0314

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Pentachlorophenol(POISON) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19 / System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 / NA	A58	1	B407	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21 / Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
NA	10.0	1 / ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	KSD981506025	M043		10.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments: Sec. I, Box H: Pentachlorophenol

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Lead Debris(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D008	181

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A59	1	B409	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
3,272.0	4,600.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD000088252	M132		4,600.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments: Sec. I, Box H: Lead Debris

FORM GM

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Poisonous(POISON) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A58	1	B001	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
2,403.5	1,015.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137		515.0
Site 2	ARD069748192	M041		500.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A W N A / W N A W N A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Fluorescent Light Tubes from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D009	181

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type NA	A58	1	B319	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
NA	677.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M019		677.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments: Sec. I, Box H: Fluorescent Light Tubes

FORM GM

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Latex Paint from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	343

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A21	1	B209	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21 / Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
7,033.0	1,905.0	1 / ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD000088252	M039		1,905.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Grease from Storage Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	352

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type NA	A58	1	B403	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
1,200.0	1,468.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M061		1,468.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments:

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Ethylene Glycol from Storage Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	134

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A37	1	B114	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
1,150.0	800.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD980887418	M051		800.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Envirosolv(contains Glycols, Monoethanolamine) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D001	343

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A19	1	B201	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
1,600.0	2,515.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M089		2,515.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Oil, Insulating from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	221

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9 6 6 1	O1 System Type N A	A56	1	B206	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
NA	1,650.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	UTD991301748	M061		1,650.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A W N A / W N A W N A	☐ 1 Yes ☐ 2 No	N A	N A	N A

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Sand from Paint Sandblasting Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	181,352

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type NA	A29	1	B319	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
121,900.0	46,900.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAT000646117	M132		46,900.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
NA NA NA NA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments: Sec. I, Box F: Paint Sandblasting Operations
Sec. I, Box H: Sand

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Organic Compounds-Liquid from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	343

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type NA	A94	1	B207	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
NA	3,518.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M089		3,518.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments:

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Inorganic Compounds-Solid from Storage Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	141

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O2 System Type N/A	A58	1	B305	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
2,008.0	559.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M132		559.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Non-RCRA Hazardous Waste Solid from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19 / System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 / NA	A58	1	B001	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21 / Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
5,640.0	784.0	1 / ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137		784.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments:

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EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Soil, Contaminated from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	611

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O2 System Type N/A	A09	1	B512	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
200.0	2,861,524.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	UTD991301748	M132		61,524.0
Site 2	UTC093012201	M132		2,800,000.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Non-RCRA Hazardous Waste Liquid from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A58	1	B001	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
15,533.0	300.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137		300.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Abrasive, Wet from Paint Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	181

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	Q1 System Type |N|A|	A21	|1|	B119	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
NA	500.0	|1|	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|		|M|	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD000088252	M132		500.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A|	|N|A|	|N|A|

Comments: Sec. I, Box H: Abrasive, Wet

FORM GM

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EPA ID NO: CA11 8000 0055 0314

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Drums, Steel, Empty from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	512,513

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A99	1	B406	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
7,950.0	5,605.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M132		4,185.0
Site 2	CAD009466392	M019		1,100.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments: Sec. III, Box B continued on supplemental page: 44a

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U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Drums, Steel, Empty from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9 6 6 1	N A		1		2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21 / Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
		1 / ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
☐ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD009452657	M132		320.0
Site 2				N/A

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
☐ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A W N A / W N A W N A	☐ 1 Yes ☐ 2 No	N A	N A	N A

Comments: Continuation from Page 44

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Drums, Plastic, With Residue for Landfill from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	513,512

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	Origin code Q1; System Type |N|A|	A99	|1|	B406	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
60.0	3,366.0	|1| ||||•||| ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M| |||	||||||||||•||	|M| |||	||||||||||•||

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M132	||	3,366.0
Site 2			||	NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A| ||||||||•||	|N|A|•||	|N|A| ||||||||•||

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Acid(CORROSIVE MATERIAL) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 NA	A58	1	B001	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
5,753.0	1,041.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137		1,006.0
Site 2	ARD069748192	M041		35.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

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U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Batteries, Lead-Acid(CORROSIVE MATERIAL) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D002 D008	792

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	Q1 System Type |N|A|	A55	|1|	B309	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
7,360.0	7,685.0	|1|	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|		|M|	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M019		7,685.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A|	|N|A|	|N|A|

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U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Inorganic Acid Solution(CORROSIVE MATERIAL) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D002 D007	792

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	Q1 System Type |N|A|	A94	|1|	B103	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
1,290.0	6,350.0	|1|	||||•||| ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|	||||||||||•||	|M|	||||||||||•||

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M079	||	6,350.0
Site 2			||	NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A| ||||||||•||	|N|A|•||	|N|A| ||||||||•||

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U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Corrosive, Poisonous(CORROSIVE MATERIAL) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	Q1 System Type |N|A|	A58	|1|	B001	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
309.0	20.0	|1|	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|		|M|	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137		20.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A|	|N|A|	|N|A|

Comments:

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U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Mercury Contaminated Waste(TOXIC) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D009	181

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	O2 System Type |N|A|	A94	|1|	B117	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
1,667.0	714.0	|1|	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|		|M|	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M019		714.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A|	|N|A|	|N|A|

Comments:

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U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Waste Cleaning Compound(contains Monoethanolamine)(TOXIC) from Aircraft Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D006 D008 D018 D021 D027	741

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9 6 6 1	Q1 System Type N A	A19	1	B106	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
120.0	232.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD053044053	M029		232.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A W N A W N A W N A	☐ 1 Yes ☐ 2 No	N A	N A	N A

Comments: Section I, Box B: D035 D039 D040

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Batteries, Ni-Cad(CORROSIVE MATERIAL) from Aircraft Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D002 D006	181

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9611	O1 System Type NA	A55	1	B309	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
1,336.0	1,425.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M019		1,425.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments:

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Caustic(CORROSIVE MATERIAL) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A58	1	B001	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
3,681.0	925.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137		925.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A W N A / W N A W N A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Caustic Solution(CORROSIVE MATERIAL) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D002	123

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type NA	A94	1	B109	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
800.0	1,950.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M079		1,950.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments:

·511

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Corrosive Liquids, Caustic(CORROSIVE MATERIAL) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D002	123

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	Q1 System Type |N|A|	A03	|1|	B110	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
NA	9,900.0	|1|	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|		|M|	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD097030993	M129		6,400.0
Site 2	CAD000088252	M079		3,500.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A|	|N|A|	|N|A|

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - PCB Capacitors-Large(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	261

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O2 System Type N/A	A56	1	B407	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
777.0	10,236.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	UTD991301748	M041		1,414.0
Site 2	AZD982465866	M041		8,822.0

A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
A W N A / W N A	☐ 1 Yes ☐ 2 No	N A	N A	N A

: Sec. I, Box H: PCB Capacitors-Large

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Instruction page 18: Photo Chemicals (Toxic) from Photo Operations

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D011	541

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	01 System Type |N|A|	A37	|1|	B114	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
366,294.0	298,731.0	|1|	☐ 1 lbs/gal ☐ sg	☒ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|0| |1|4|	|1|8|6|6|•|0|	|M|0| |7|8|	|2|9|1|0|0|3|•|0|

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ☒ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD070148432	M019		1,600.0
Site 2	CAD059494310	M089		5,925.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ☒ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A| |•|	|N|A|•|	|N|A| |•|

Comments:
Section I, Box F - A75, A72 Additional Source Codes
Section II, On-Site Process System 1 - Electrolytic Recovery
On-Site Process System II - Evaporation

Sec. III, Box B continued on supplemental page: 57a

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Photo Chemicals(TOXIC) from Photo Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	|N|A|		|1|		|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
		|1|	||||•||| ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|	||||||||||•||	|M|	||||||||||•||

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
☐ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD003963592	M019	||	203.0
Site 2			||	N/A

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
☐ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A| |||||||||•||	|N|A|•||	|N|A| |||||||||•||

Comments: Continuation from Page 57

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EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Inorganic Compounds, Solid-Regulated(TOXIC) from Paint Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D004 D005 D006 D007 D008	181,352

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A93	1	B319	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
NA	35,000.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAT000646117	M132		35,000.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A W N A / W N A W N A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments: Sec. I, Box H: Inorganic Compounds, Solid-Regulated
Section I, Box B: D009 D010 D011

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EPA ID NO: CA1 8000 0005 0314

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Solids Contaminated With Solvents(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
F001 F002 D018 D019 D022	181,352

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 NA	A19	1	B409	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
1,503.0	2,691.0	1	. ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M	.	M	.

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M043		2,691.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA .	NA .	NA .

Comments: Sec. I, Box H: Solids Contaminated With Solvents
Section I, Box B: D035 D040 F003-F005

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EPA ID NO: CA11 8000 0515 0314

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Lead Paint Solids(TOXIC) from Paint Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D008	181

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A08	1	B209	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
52,570.0	43,622.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAT000646117	M132		24,000.0
Site 2	CAD059494310	M043		9,322.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments: Sec. III, Box B continued on supplemental page: 60a

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Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Lead Paint Solids(TOXIC) from Paint Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	|N|A|		|1|		|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
		|1|	|_|_|_|.|_|_| ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|	|_|_|_|_|_|_|_|_|.|_|	|M|	|_|_|_|_|_|_|_|_|.|_|

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
☐ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD000088252	M132	|_|	10,300.0
Site 2			|_|	N/A

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
☐ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A| |_|_|_|_|_|_|_|.|_|	|N|A|.|_|	|N|A| |_|_|_|_|_|_|_|.|_|

Comments: Continuation from Page 60

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Asbestos Contaminated Solid(TOXIC) from Asbestos Removal
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	151

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O2 System Type NA	A69	1	B311	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
12,890.0	63,430.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	UTD991301748	M132		53,620.0
Site 2	CAL000027741	M132		5,250.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments: Sec. III, Box B continued on supplemental page: 61a

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EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Asbestos Contaminated Solid(TOXIC) from Asbestos Removal
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	|N|A|		|1|		|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
		|1|	||||•||| ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|	||||||||||•|||	|M|	||||||||||•|||

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
☐ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M132		4,560.0
Site 2				N/A

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
☐ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A| ||||||||•|||	|N|A|•|||	|N|A| ||||||||•|||

Comments: Continuation from Page 61

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EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Batteries, Lithium(TOXIC) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A58	1	B001	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
330.0	20.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	ARD069748192	M137		10.0
Site 2	CAD059494310	M137		10.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - PCB Contaminated Solid(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	261

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O2 System Type N/A	A56	1	B407	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
11,581.0	14,005.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22. ■ 1 Yes (CONTINUE TO BOX B) ☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	UTD991301748	M132		2,524.0
Site 2	AZD983473539	M043		3,751.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments: Sec. III, Box B continued on supplemental page: 63a
Sec. I, Box H: PCB Contaminated Solid

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Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - PCB Contaminated Solid(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	System Type |N|A|		|1|		|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
		|1|	|_|_|.|_|_| ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|_|_|_|	|_|_|_|_|_|_|_|_|_|.|_|_|	|M|_|_|_|	|_|_|_|_|_|_|_|_|_|.|_|_|

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
☐ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	AZD982465866	M039	|_|	7,730.0
Site 2			|_|	N/A

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
☐ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A| |_|_|_|_|_|_|_|_|.|_|_|	|N|A|.|_|_|	|N|A| |_|_|_|_|_|_|_|_|.|_|_|

Comments: Continuation from Page 63

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EPA ID NO: CA11 8000 0005 0134

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Class 9, Solid(TOXIC) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	Q1 System Type N/A	A58	1	B001	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
2,337.0	100.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137		100.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Labpacks-Class 9, Liquid(TOXIC) from Lab Clean-out
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
LABP	551

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A58	1	B001	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
1,017.0	20.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M137		20.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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Moffett Field, CA 94035-1000

EPA ID NO: CA1 800 005 034

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - PCB Oil, 0-1000 ppm(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	261

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O2 System Type NA	A69	1	B219	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
2,607.0	97,433.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	KSD981506025	M125		1,124.0
Site 2	UTD991301748	M041		86,866.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
WNA WNA WNA WNA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments: Sec. III, Box B continued on supplemental page: 66a
Sec. I, Box H: PCB Oil, 0-1000 ppm

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - PCB Oil, 0-1000 ppm(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code

D. SIC code Page 19	E. Origin code Page 19 System Type	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	|N|A|		|1|		|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
		|1|	||||•||| ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M|	||||||||||•||	|M|	||||||||||•||

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
☐ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	AZD982465866	M041	||	8,132.0
Site 2	KSD980964993	M125	||	1,311.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
☐ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A| |||||||||•||	|N|A|•||	|N|A| |||||||||•||

Comments: Continuation from Page 66

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1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Cooling Tower Sludge(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D008	135

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A60	1	B513	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
850.0	13,655.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M109		13,655.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Soil, RCRA Contaminated(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
F001 F002 F003	611

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
|9|6|6|1|	O2 System Type |N|A|	A53	|1|	B301	|2|

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
NA	15,800.0	|1|	||||•||| ☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
|M||||	||||||||||•|||	|M||||	||||||||||•|||

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	KSD981506025	M043	||	15,000.0
Site 2	CAD050806850	M043	||	800.0

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
|W|N|A| |W|N|A| |W|N|A| |W|N|A|	☐ 1 Yes ☐ 2 No	|N|A| ||||||||•|||	|N|A|•||	|N|A| ||||||||•|||

Comments:

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

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Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Soil, PCB Contaminated(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
NA	611

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9161	O2 System Type N A	A69	1	B301	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
NA	849,102.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	NVT330010000	M132		849,102.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A W N A / W N A W N A	☐ 1 Yes ☐ 2 No	N A	N A	N A

Comments:

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EPA ID NO: CA11 8100 0015 0314

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Soil, Lead Contaminated(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D008	611

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O2 System Type N/A	A53	1	B302	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
30,000.0	40,000.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD000633164	M132		40,000.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Oily Water with Lead(TOXIC) from Paint Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D008	135

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A19	1	B209	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
800.0	4,900.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD000088252	M039		4,900.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A W N A / W N A W N A	☐ 1 Yes ☐ 2 No	N A	N A	N A

Comments:

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA AMES RESEARCH CENTER
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EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Water with Lead Paint Chips(TOXIC) from Paint Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D008	132

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O1 System Type N/A	A21	1	B114	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
NA	800.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD000088252	M132		800.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W/N/A W/N/A W/N/A W/N/A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

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SITE NAME: U.S. NASA AMES RESEARCH CENTER
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I Waste description - Sump Sludge/Water(TOXIC) from Site Operations
Instruction page 18

B. EPA hazardous waste code Page 18	C. State hazardous waste code
D006 D008	132

D. SIC code Page 19	E. Origin code Page 19	F. Source code Page 20	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	O2 System Type N/A	A60	1	B513	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21	B. Quantity generated in 1995 Page 21	C. UOM Page 21	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, discharge to a sewer/POTW? Page 21
NA	26,598.0	1	☐ 1 lbs/gal ☐ sg	☐ 1 Yes (CONTINUE TO SYSTEM 1) ■ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1		ON-SITE PROCESS SYSTEM 2	
ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995	ON-SITE PROCESS SYSTEM TYPE PAGE 22	QUANTITY TREATED, DISPOSED, OR RECYCLED ON SITE IN 1995
M		M	

Sec. III A. Was any of this waste shipped off-site in 1995 Instruction page 22.
■ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23	C. System type shipped to Page 23	D. Off-site availability code Page 23	E. Total quantity shipped in 1995 Page 23
Site 1	CAD059494310	M089		26,598.0
Site 2				NA

Sec. IV A. Did new activities in 1995 result in minimization of this waste? Instruction page 24.
☐ 1 Yes (CONTINUE TO SYSTEM 1)
■ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W N A W N A W N A W N A	☐ 1 Yes ☐ 2 No	N/A	N/A	N/A

Comments:

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

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Moffett Field, CA 94035-1000

EPA ID NO: CA1 800 0005 0314

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

FORM GM

WASTE GENERATION AND MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 16 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I

A. Waste description - Instruction page 18.

Silver bearing washwaters from photographic processing.

B. EPA hazardous waste code Page 19.

D011

C. State hazardous waste code Page 19.

541

D. SIC code Page 19.	E. Origin code Page 19	F. Source code Page 20.	G. Point of measurement Page 20.	H. Form code Page 20.	I. RCRA - radioactive mixed Page 20.
9661	1 System Type NA	A75	1	B119	2

Sec. II

A. Quantity generated in 1994 Instruction Page 21.	B. Quantity generated in 1995 Page 21.	C. UOM Page 21.	Density	D. Did this site do any of the following to this waste: treat on site, dispose on site, recycle on site, or discharge to a sewer/POTW? Page 21.
	209040.0	5	1.0 ☐ 1 lbs/gal ☒ 2 sg	☒ 1 Yes (CONTINUE TO SYSTEM 1) ☐ 2 No (SKIP TO SEC. III)

ON-SITE PROCESS SYSTEM 1

On-site process system type Page 22.	Quantity treated, disposed, or recycled on site in 1995
M078	209040.0

ON-SITE PROCESS SYSTEM 2

On-site process system type Page 22.	Quantity treated, disposed, or recycled on site in 1995
M NA	NA

Sec. III

A. Was any of this waste shipped off-site in 1995 Instruction page 22. ☐ 1 Yes (CONTINUE TO BOX B) ☒ 2 No (SKIP TO SEC IV)

	B. EPA ID No. of facility waste was shipped to Page 23.	C. System type shipped to Page 23.	D. Off-site availability code Page 23.	E. Total quantity shipped in 1995 Page 23.
Site 1		M		
Site 2		M		

Sec. IV

A. Did new activities in 1995 result in minimization of this waste? Instruction page 24. ☐ 1 Yes (CONTINUE TO BOX B) ☒ 2 No (THIS FORM IS COMPLETE)

B. Activity Page 24.	C. Other effects Page 25.	D. Quantity recycled in 1995 due to new activities Page 25.	E. Activity/production index Page 25.	F. 1995 source reduction quantity Page 26.
W NA W NA W NA W NA	☐ 1 Yes ☐ 2 No	NA	NA	NA

Comments:

Section I, Box H - Aqueous Waste with Low Inorganics

Section II, On-Site Process System 1 - ION Exchange

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA Ames Research Center
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

FORM **PS**

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

WASTE TREATMENT, DISPOSAL, OR RECYCLING PROCESS SYSTEMS

INSTRUCTIONS: Read the detailed instructions beginning on page 33 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I

A. Waste treatment, disposal, or recycling system description
Instruction Page 38.
Oil/Water Separator - Tank Based Unit #010MP5BF05*

B. System Type Page 38.	C. Regulatory Status Page 39.	D. Operational status Page 39.	E. Unity types Page 39.
|M|1|2|4|	|0|3|	|0|1|	|0|1||N|A|

Sec. II

A. 1995 influent quantity
Instruction page 40.

		UOM	Density
Total	|1|9|6|0|0|.|0|	|5|	|8|.|3|4|
RCRA	|N|A|		[x] 1 lbs/gal [ ] 2 sg

B. Maximum operational capacity
Page 41.

Total	|3|0|0|.|0|
RCRA	|N|A|

C. 1995 liquid effluent quantity
Instruction page 42.

		UOM	Density
Total	|1|9|5|0|8|.|0|	|5|	|8|.|3|4|
RCRA	|N|A|		[x] 1 lbs/gal [ ] 2 sg

D. 1995 solid/sludge residual quantity
Page 43.

		UOM	Density
Total	|7|3|7|.|5|	|1|	
RCRA	|N|A|		[ ] 1 lbs/gal [ ] 2 sg

E. Limitation on maximum operational capacity Page 43.	F. Commercial capacity availability code Page 43.	G. Percent capacity commercially available Page 43
1. |0|9| 2. |N|A| 3. |N|A|	|1|	|0| %

Comments:

Section I, Box A *property tag number, Unit is located at Bldg. N229A
Section I, Box B Oil/Water Separator
Section II, Box B gallons per hour

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA Ames Research Center
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

FORM **PS**

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

WASTE TREATMENT, DISPOSAL, OR RECYCLING PROCESS SYSTEMS

INSTRUCTIONS: Read the detailed instructions beginning on page 33 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I

A. Waste treatment, disposal, or recycling system description
Instruction Page 38.
Oil/Water Separator - Tank Based Unit #006MP89BFO*

B. System Type Page 38.	C. Regulatory Status Page 39.	D. Operational status Page 39.	E. Unity types Page 39.
|M|1|2|4|	|0|3|	|0|1|	|0|1||N|A|

Sec. II

A. 1995 influent quantity
Instruction page 40.

		UOM	Density
Total	|9|7|0|6|.|0|	|5|	|8|.|3|4|
RCRA	|N|A|		

[x] 1 lbs/gal [ ] 2 sg

B. Maximum operational capacity
Page 41.

Total \|3\|0\|0\|.\|0\|
RCRA \|N\|A\|

C. 1995 liquid effluent quantity
Instruction page 42.

		UOM	Density
Total	|9|6|1|4|.|0|	|5|	|8|.|3|4|
RCRA	|N|A|		

[x] 1 lbs/gal [ ] 2 sg

D. 1995 solid/sludge residual quantity
Page 43.

		UOM	Density
Total	|7|3|7|.|5|	|1|	
RCRA	|N|A|		

[ ] 1 lbs/gal [ ] 2 sg

E. Limitation on maximum operational capacity Page 43.	F. Commercial capacity availability code Page 43.	G. Percent capacity commercially available Page 43
1. |0|9| 2. |N|A| 3. |N|A|	|1|	|0| %

Comments:

Section I, Box A *property tag number, Unit is located at Bldg. N250
Section I, Box B Oil/Water Separator
Section II, Box B gallons per hour

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA Ames Research Center
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

FORM **PS**

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

WASTE TREATMENT, DISPOSAL, OR RECYCLING PROCESS SYSTEMS

INSTRUCTIONS: Read the detailed instructions beginning on page 33 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I	A. Waste treatment, disposal, or recycling system description Instruction Page 38. IMG ARU Electrolytic Silver Recovery Tank Based Unit #001M15KJ19*			
	B. System Type Page 38. |M|0|1|4|	C. Regulatory Status Page 39. |0|3|	D. Operational status Page 39. |0|1|	E. Unity types Page 39. |0|1|N|A|

Sec. II	A. 1995 influent quantity Instruction page 40.			B. Maximum operational capacity Page 41.
		UOM	Density	
Total	| | |3|4|9|.|0|	|5|	|1|.|1| |	Total | | |2|.|0|
RCRA	| | |3|4|9|.|0|		☐ 1 lbs/gal ☒ 2 sg	RCRA | | |2|.|0|

C. 1995 liquid effluent quantity Instruction page 42.				D. 1995 solid/sludge residual quantity Page 43.		
		UOM	Density		UOM	Density
Total	| | |3|4|9|.|0|	|5|	|1|.|1| |	Total | |N|A|.| |	| |	
RCRA	| | |3|4|9|.|0|		☐ 1 lbs/gal ☒ 2 sg	RCRA |N|A|		☐ 1 lbs/gal ☐ 2 sg

E. Limitation on maximum operational capacity Page 43.	F. Commercial capacity availability code Page 43.	G. Percent capacity commercially available Page 43
1. |0|9| 2. |0|5| 3. |0|7|	|1|	|0| %

Comments:

Section I, Box A *property tag number
Section I, Box B Electrolytic Recovery
Section II, Box B gallons per 24 hour period

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA Ames Research Center
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

FORM **PS**

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

WASTE TREATMENT, DISPOSAL, OR RECYCLING PROCESS SYSTEMS

INSTRUCTIONS: Read the detailed instructions beginning on page 33 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I

A. Waste treatment, disposal, or recycling system description
Instruction Page 38.
Omni 32 Electrolytic Silver Recovery in Tank Unit #002M000377*

B. System Type Page 38.	C. Regulatory Status Page 39.	D. Operational status Page 39.	E. Unity types Page 39.
|M|0|1|4|	|0|3|	|0|1|	|0|1|N|A|

Sec. II

A. 1995 influent quantity
Instruction page 40.

		UOM	Density
Total	| | |6|2|5|.|0|	|5|	|1|.|1| |
RCRA	| | |6|2|5|.|0|		

☐ 1 lbs/gal ☒ 2 sg

B. Maximum operational capacity
Page 41.

Total	| | |2|.|0|
RCRA	| | |2|.|0|

C. 1995 liquid effluent quantity
Instruction page 42.

		UOM	Density
Total	| | |6|2|5|.|0|	|5|	|1|.|1| |
RCRA	| | |6|2|5|.|0|		

☐ 1 lbs/gal ☒ 2 sg

D. 1995 solid/sludge residual quantity
Page 43.

		UOM	Density
Total	| |N|A|.| |	| |	
RCRA	|N|A|		

☐ 1 lbs/gal ☐ 2 sg

E. Limitation on maximum operational capacity Page 43.	F. Commercial capacity availability code Page 43.	G. Percent capacity commercially available Page 43
1. |0|9| 2. |0|5| 3. |0|7|	|1|	|0| %

Comments:

Section I, Box A *property tag number
Section I, Box B Electrolytic Recovery
Section II, Box B gallons per 8 hour shift

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA Ames Research Center
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

FORM **PS**

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

WASTE TREATMENT, DISPOSAL, OR RECYCLING PROCESS SYSTEMS

INSTRUCTIONS: Read the detailed instructions beginning on page 33 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I

A. Waste treatment, disposal, or recycling system description
Instruction Page 38.

Rotex Electrolytic Silver Recovery in Tank Unit #003M304004*

B. System Type Page 38.	C. Regulatory Status Page 39.	D. Operational status Page 39.	E. Unity types Page 39.
|M|0|1|4|	|0|3|	|0|1|	|0|1||N|A|

Sec. II

A. 1995 influent quantity
Instruction page 40.

		UOM	Density
Total	| | |7|2|2|.|0|	|5|	|1|.|1| |
RCRA	| | |7|2|2|.|0|		☐ 1 lbs/gal ☒ 2 sg

B. Maximum operational capacity
Page 41.

Total	| | |2|.|0|
RCRA	| | |2|.|0|

C. 1995 liquid effluent quantity
Instruction page 42.

		UOM	Density
Total	| | |7|2|2|.|0|	|5|	|1|.|1| |
RCRA	| | |7|2|2|.|0|		☐ 1 lbs/gal ☒ 2 sg

D. 1995 solid/sludge residual quantity
Page 43.

		UOM	Density
Total	| |N|A|.| |	| |	
RCRA	|N|A|		☐ 1 lbs/gal ☐ 2 sg

E. Limitation on maximum operational capacity Page 43.	F. Commercial capacity availability code Page 43.	G. Percent capacity commercially available Page 43
1. |0|9| 2. |0|5| 3. |0|7|	|1|	|0| %

Comments:

Section I, Box A *property tag number
Section I, Box B Electrolytic Recovery
Section II, Box B gallons per 24 hour period

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA Ames Research Center
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

FORM **PS**

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

WASTE TREATMENT, DISPOSAL, OR RECYCLING PROCESS SYSTEMS

INSTRUCTIONS: Read the detailed instructions beginning on page 33 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I

A. Waste treatment, disposal, or recycling system description
Instruction Page 38.
Calfran Evaporative Treatment of Photoprocessing Waste in Tanks #004M590516*

B. System Type Page 38.	C. Regulatory Status Page 39.	D. Operational status Page 39.	E. Unity types Page 39.
|M|0|7|8|	|0|3|	|0|1|	|0|1||0|2|

Sec. II

A. 1995 influent quantity
Instruction page 40.

		UOM	Density
Total	|3|1|7|2|0|.|4|	|5|	|1|.|1| |
RCRA	|3|1|7|2|0|.|4|		☐ 1 lbs/gal ☒ 2 sg

B. Maximum operational capacity
Page 41.

Total	|5|0|0|.|0|
RCRA	|5|0|0|.|0|

C. 1995 liquid effluent quantity
Instruction page 42.

		UOM	Density
Total	|2|3|7|2|0|.|4|	|5|	|1|.|0| |
RCRA	|2|3|7|2|0|.|4|		☐ 1 lbs/gal ☒ 2 sg

D. 1995 solid/sludge residual quantity
Page 43.

		UOM	Density
Total	|8|0|0|0|.|0|	|5|	|1|1|.|2| |
RCRA	|8|0|0|0|.|0|		☐ 1 lbs/gal ☐ 2 sg

E. Limitation on maximum operational capacity
Page 43.
1. |0|9| 2. |0|5| 3. |0|7|

F. Commercial capacity availability code
Page 43.
|1|

G. Percent capacity commercially available
Page 43
|0| %

Comments:

Section I, Box A *property tag number
Section I, Box B Evaporation
Section II, Box B Calfran treatment consists of three evaporation units with a total combined maximum treatment capacity of 500 gallons per 24 hour period. The third Calfran unit was installed in October 1995 and was operational on December 7, 1995.

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME: U.S. NASA Ames Research Center
Moffett Field, CA 94035-1000

EPA ID NO: |C|A|1| |8|0|0| |0|0|5| |0|3|4|

FORM **PS**

U.S. ENVIRONMENTAL PROTECTION AGENCY

1995 Hazardous Waste Report

WASTE TREATMENT, DISPOSAL, OR RECYCLING PROCESS SYSTEMS

INSTRUCTIONS: Read the detailed instructions beginning on page 33 of the 1995 Hazardous Waste Report booklet before completing this form.

Sec. I

A. Waste treatment, disposal, or recycling system description
Instruction Page 38.
Pace FeCN Scrubber - Treatment of Rinsewater by Ion Exchange #005M109000*

B. System Type Page 38.	C. Regulatory Status Page 39.	D. Operational status Page 39.	E. Unity types Page 39.
|M|0|7|8|	|0|3|	|0|1|	|0|2||N|A|

Sec. II

A. 1995 influent quantity
Instruction page 40.

		UOM	Density
Total	|2|0|9|0|4|0|.|0|	|5|	|1|.|0| |
RCRA	|2|0|9|0|4|0|.|0|		

☐ 1 lbs/gal ☒ 2 sg

B. Maximum operational capacity
Page 41.

Total	|4|8|0|0|.|0|
RCRA	|4|8|0|0|.|0|

C. 1995 liquid effluent quantity
Instruction page 42.

		UOM	Density
Total	|2|0|9|0|4|0|.|0|	|5|	|1|.|0| |
RCRA	|2|0|9|0|4|0|.|0|		

☐ 1 lbs/gal ☒ 2 sg

D. 1995 solid/sludge residual quantity
Page 43.

		UOM	Density
Total	|N|A|.| |	| |	
RCRA	|N|A|.| |		

☐ 1 lbs/gal ☐ 2 sg

E. Limitation on maximum operational capacity Page 43.	F. Commercial capacity availability code Page 43.	G. Percent capacity commercially available Page 43
1. |0|9| 2. |0|5| 3. |0|7|	|1|	|0| %

Comments:

Section I, Box A *property tag number
Section I, Box B Ion Exchange
Section II, Box B gallons per 8 hour shift

G

MOFFETT FIELD SITE CONTINGENCY PLAN

Prepared by:

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
Moffett Field, California 94035-1000

FOR

NASA Ames Research Center
Occupational Safety, Health and Environmental Services Office
MS 218-1, Moffett Field, California 94035-1000

December 1995

SITE CONTINGENCY PLAN
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1.0 PURPOSE 1

2.0 LIST OF ACRONYMS 1

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SITE CONTINGENCY PLAN
APPENDICES TITLES

Appendix A: SITE EMERGENCY SPILL COORDINATORS

Appendix B: LAIDLAW ENVIRONMENTAL SERVICES INC. (Laidlaw) EMERGENCY RESPONSE VEHICLE SUPPLY INVENTORY

Appendix C: AGENCY NOTIFICATION CONTACTS

MOFFETT FIELD
SITE CONTINGENCY PLAN

1.0 PURPOSE

The Site Contingency Plan establishes emergency response procedures for incidents involving hazardous waste and/or hazardous waste constituents which could threaten human health or the environment at Moffett Field. Moffett Field consists of NASA Ames Research Center and Moffett Federal Airfield (MFA). This Site Contingency Plan applies to all portions of Moffett Field. The contigous site will be referred to as Moffett Field.

2.0 LIST OF ACRONYMS

BAAQMD - Bay Area Air Quality Management District

DFG - State of California Department of Fish and Game

DTSC - State of California Department of Toxic Substances Control

DHS-RAD - State of California Department of Health Services Radiological Health Division

BEAP - Moffett Field Individual Building Emergency Action Plans

CANG - California Air National Guard

CANG-FD - California Air National Guard Fire Department

NRC - Nuclear Regulatory Commission

OES - State of California Office of Emergency Services

Cal EPA - California Environmental Protection Agency

EPA Region IX - U.S. Environmental Protection Agency Region IX Office

RWQCB - State of California Regional Water Quality Control Board

STP - Standard Temperture and Pressure

SCCHD-HMCD - Santa Clara County Health Department - Hazardous Materials Compliance Division

USCG-NRC - United States Coast Guard National Response Center

3.0 GENERAL

3.1 Emergency coordination and notification for incidents involving hazardous waste and/or hazardous materials will be in accordance with the requirements of the Resource Conservation and Recovery Act (RCRA), 40 CFR 264.50 to 264.56, and 22 CCR 66264.51 to 66264.56.

3.2 Emergency coordination and notification for incidents involving hazardous waste and/or hazardous waste constituents will be in accordance with requirements defined in the Moffett Field Spill Prevention Control and Countermeasures Plan and Facility Response Plan, the Ames Health and Safety Manual, the Draft Ames Environmental Management Handbook, and the Ames Emergency Services Handbook.

3.3 The Site Contingency Plan includes by reference the following documents.

3.3.1 Moffett Field individual Building Emergency Action Plans (BEAP).

3.3.2 Moffett Field Security Dispatch procedures for emergency notifications.

3.3.3 NASA Ames Research Center Hazardous Waste Management Procedure[1] in Chapter 4.0 of the Draft Ames Environmental Management Handbook.

3.4 Figure 1 illustrates the Moffett Field emergency notification series and the relationships between the referenced procedures.

3.5 Site Emergency Spill Coordinators are listed in Appendix A.

3.6 Site emergency spill response team equipment and locations are listed in Appendix B. Additional spill equipment is located at each hazardous materials storage and waste accumulation area.

3.7 Arrangements with local emergency response agencies and hospitals are as follows:

---

[1]NASA Ames Research Center Hazardous Waste Management Procedures are now also applicable to the entire Moffett Field site.

3.7.1 The California Air National Guard Fire Department has a mutual aid agreement with Santa Clara County. In the event that additional aid is needed during an emergency at Moffett Field, CANG-FD will utilize this agreement.

3.7.2 The Moffett Field Security Dispatch Office has an agreement with the CANG 129th Security Police for additional security support when required.

3.7.3 A contract exists between Science Applications International Corporation (SAIC) and their subcontractor, Laidlaw Environmental Services Inc. (Laidlaw), for 24 hour emergency spill response at Moffett Field.

3.7.4 The nearest civilian hospital is El Camino Hospital, 2500 Grant Road, Mountain View, CA 94040. The phone number is 415-940-7211.

4.0 RESPONSIBILITIES

4.1 All Moffett Field employees, contractors and on-site personnel are required to follow the notification requirements in their facilities' Building Emergency Action Plan (BEAP). The BEAP specifies that in the event of an accident, fire, explosion, chemical release, flooding or other emergency that the Moffett Field Security Dispatch Office be notified **by dialing 9-1-1 from a government phone on site or dialing 415-604-0342 from a phone off site.**

4.2 The Moffett Field Security Dispatch Office is responsible for notifying all required emergency services and the NASA Ames Safety, Health and Environmental Services Office Representative who serves as the Site Emergency Spill Coordinator.

4.3 The Site Emergency Spill Coordinator is responsible for responding to emergencies as required and carrying out coordination/notification as required in the Site Contingency Plan.

4.4 The NASA Ames Safety, Health and Environmental Services Office is responsible for the following:

4.4.1 Designating the Site Emergency Spill Coordinator(s) and alternate(s).

4.4.2 Ensuring that the Site Emergency Spill Coordinator is either on-site or on-call at all times.

4.4.3 Ensuring that the person designated as the Site Emergency Spill Coordinator is:

- Thoroughly familiar with all aspects of the Site Contingency Plan,
- Thoroughly familiar with all operations and activities at the facility,
- Thoroughly familiar with the location and characteristics of waste handled,
- Familiar with the facility layout, and
- Authorized to commit resources needed to carry out the Site Contingency Plan.

4.4.4 Amending the Site Contingency Plan whenever:

- Applicable regulations are revised,
- The plan fails in an emergency,
- The facility design, operations, construction, or maintenance significantly changes, or
- The list of Site Emergency Spill Coordinators or list of emergency equipment needs to be updated.

5.0 REQUIREMENTS

5.1 The Site Emergency Spill Coordinator will immediately ensure that the following activities are completed whenever there is an imminent or actual emergency situation:

5.1.1 Internal facility alarms or communication systems, where applicable, are activated to notify all facility personnel; and

5.1.2 Appropriate state or local agencies with designated response roles are notified when applicable.

5.2 Whenever there is a release, fire, or explosion, the Site Emergency Spill Coordinator must immediately identify the character, exact source, amount, and a real extent of any released materials. This may be done by observation or review of facility records or manifests, and, if necessary, by chemical analysis.

5.3 Concurrently, the Site Emergency Spill Coordinator must assess possible hazards to human health or the environment that may result from the release, fire, or explosion. This assessment must consider both direct and indirect effects of the release, fire, or explosion (e. g. the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface water run-off from water or chemical agents used to control fire and heat-induced explosion).

5.4 If the Site Emergency Spill Coordinator determines that the facility has had a release, fire or explosion which could threaten human health, or the environment, outside the facility, the findings must be reported as follows:

5.4.1 The Site Emergency Spill Coordinator must be available to help the appropriate officials decide whether local areas should be evacuated. If the assessment indicates that evacuation of local areas may be advisable, the Moffett Field Security Dispatch Office will immediately notify the affected jurisdictions' communications center. The Site Emergency Spill Coordinator must notify the Cal EPA and the OES of the evacaution. Refer to Appendix C for agency notification contacts.

5.4.2 The Site Emergency Spill Coordinator must immediately notify either the government official designated as the on-scene coordinator for that geographical area; or if the reportable quantity of a hazardous constituent has been released, the National Response Center must be notified at 800-424-8802. The report must include the following:

- Name and telephone number of reporter;
- Name and address of facility;
- Time and type of incident (e.g. release, fire);

- Name and quantity of material(s) involved, to the extent known;
- The extent of injuries, if any; and
- The possible hazards to human health or the environment, outside the facility.

5.5 During an emergency, the Site Emergency Spill Coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other hazardous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.

5.6 If the facility stops operations in response to a fire, explosion, or release, the Site Emergency Spill Coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.

5.7 Immediately after an emergency, the Site Emergency Spill Coordinator must provide for treating, storing, or disposing of, recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility.

5.8 The Site Emergency Spill Coordinator must ensure that, in the affected area(s) of the facility:

5.8.1 No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and

5.8.2 All emergency equipment listed in the Site Contingency Plan is cleaned and fit for its intended use before operations are resumed.

5.9 The Site Emergency Spill Coordinator, or his/her designee, must notify the Cal EPA, the OES, and the EPA Region IX Offices, that the facility is in compliance with paragraph (5.8) of this section before operations are resumed in the affected area(s). Refer to Appendix C for the agency contact list.

5.10 The Site Emergency Spill Coordinator, or his/her designee, must note in the operating record the time, date, and details of any incident that requires implementing the Site Contingency Plan. Within 15 days after the incident, he/she must submit a written report on the incident to the Cal EPA, the OES, and the EPA Region IX Offices. The report must include:

5.10.1 Name, address, and telephone number of the owner or operator;

5.10.2 Name, address and telephone of the facility;

5.10.3 Date, time and type of incident (e.g. release, fire);

5.10.4 Name and quantity of material(s) involved;

5.10.5 The extent of injuries, if any; and

5.10.6 An assessment of actual or potential hazards to human health or the environment,when;

5.10.7 Estimated quantity and disposition of recovered material that resulted from the incident.

5.11 The Site Emergency Spill Coordinator, or his/her designee, will ensure that the required reporting takes place as soon as practical during or after the incident.

5.11.1 Reporting requirements by incident type are illustrated in Figures 2, 3, and 4.

5.11.2 Agencies and associated phone numbers and contacts are attached as Appendix C.

5.12 The Contingency Plan must be reviewed, and immediately amended, if necessary, whenever:

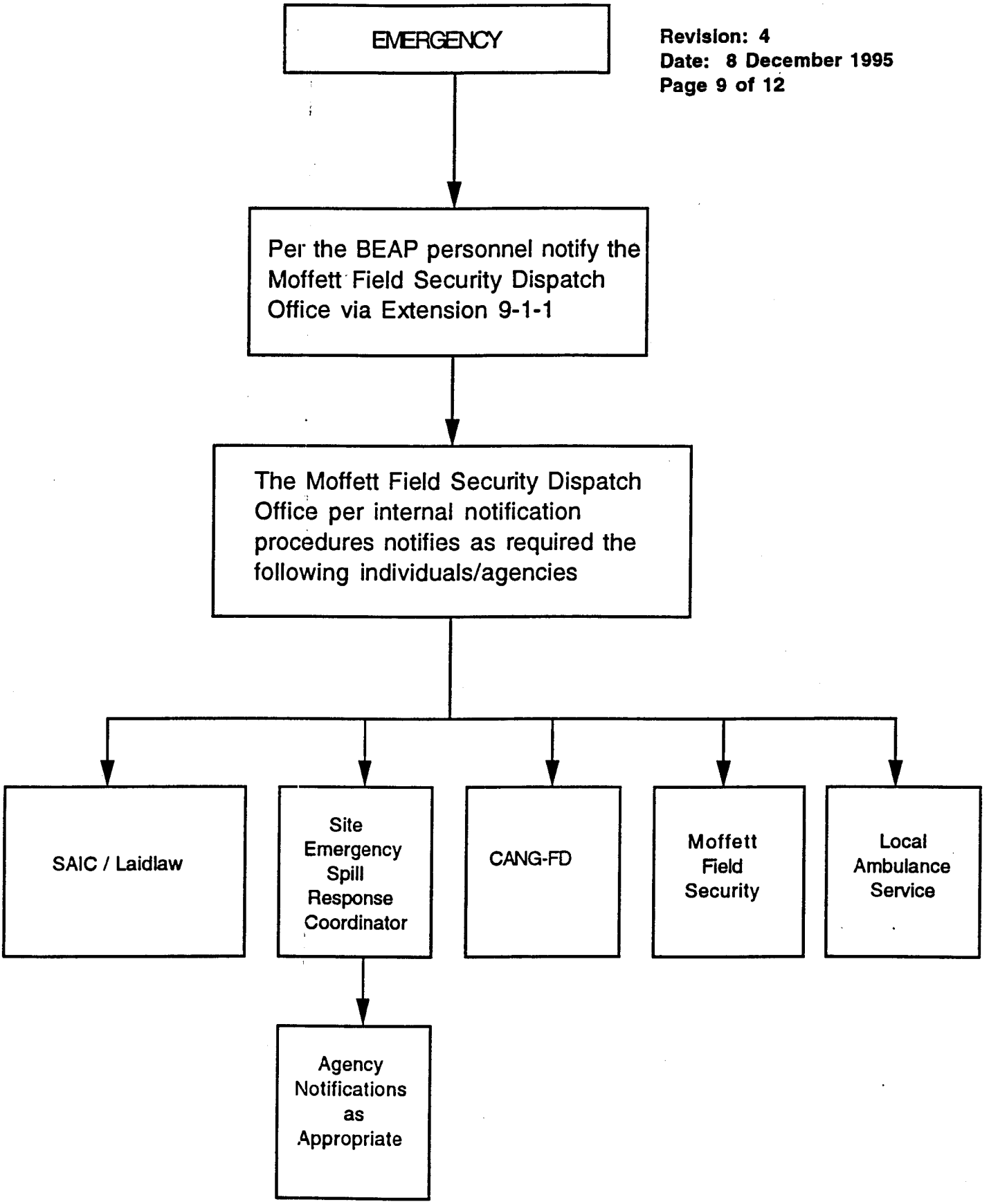
5.12.1 The facility permit is revised.

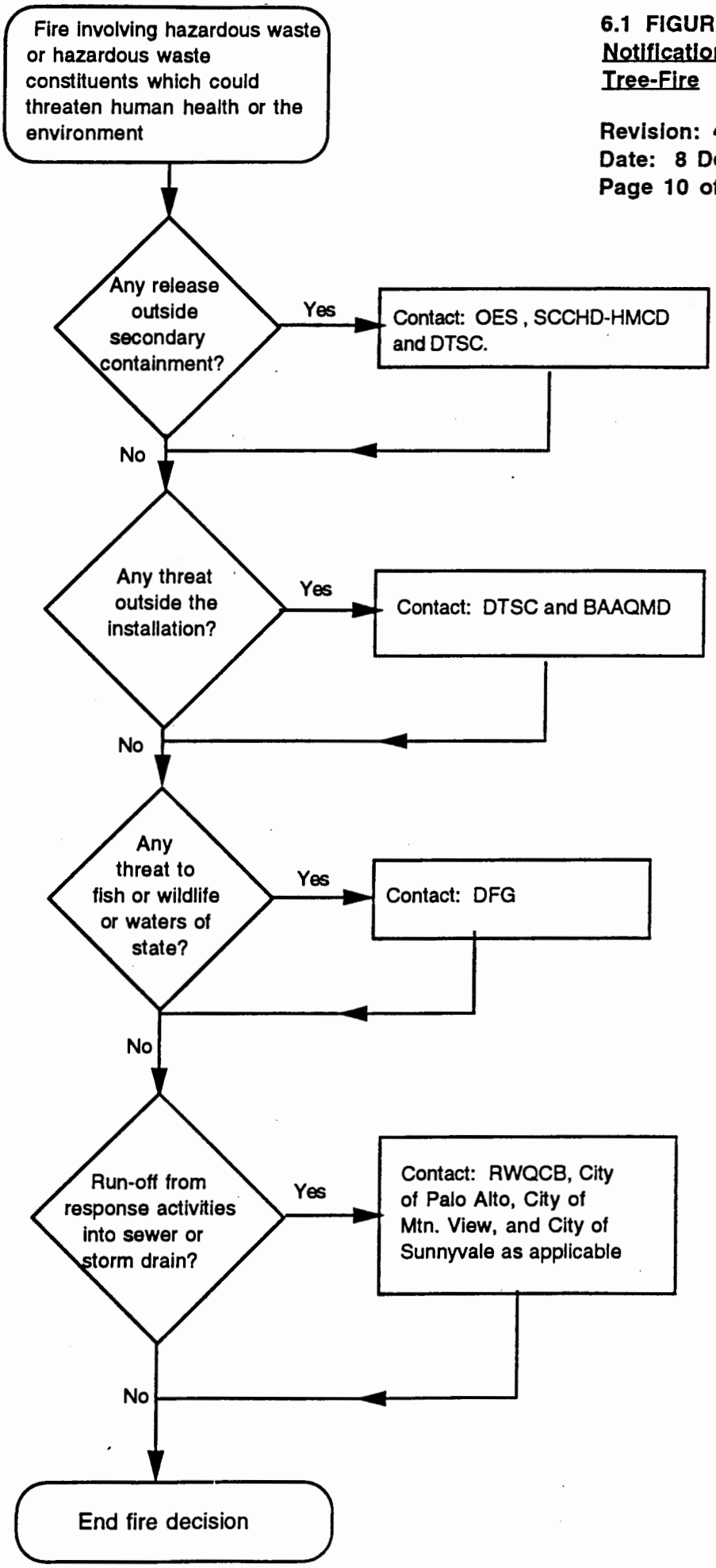
5.12.2 The plan fails in an emergency.

5.12.3 The facility changes in its design, construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency.

5.12.4 The list of emergency coordinators changes.

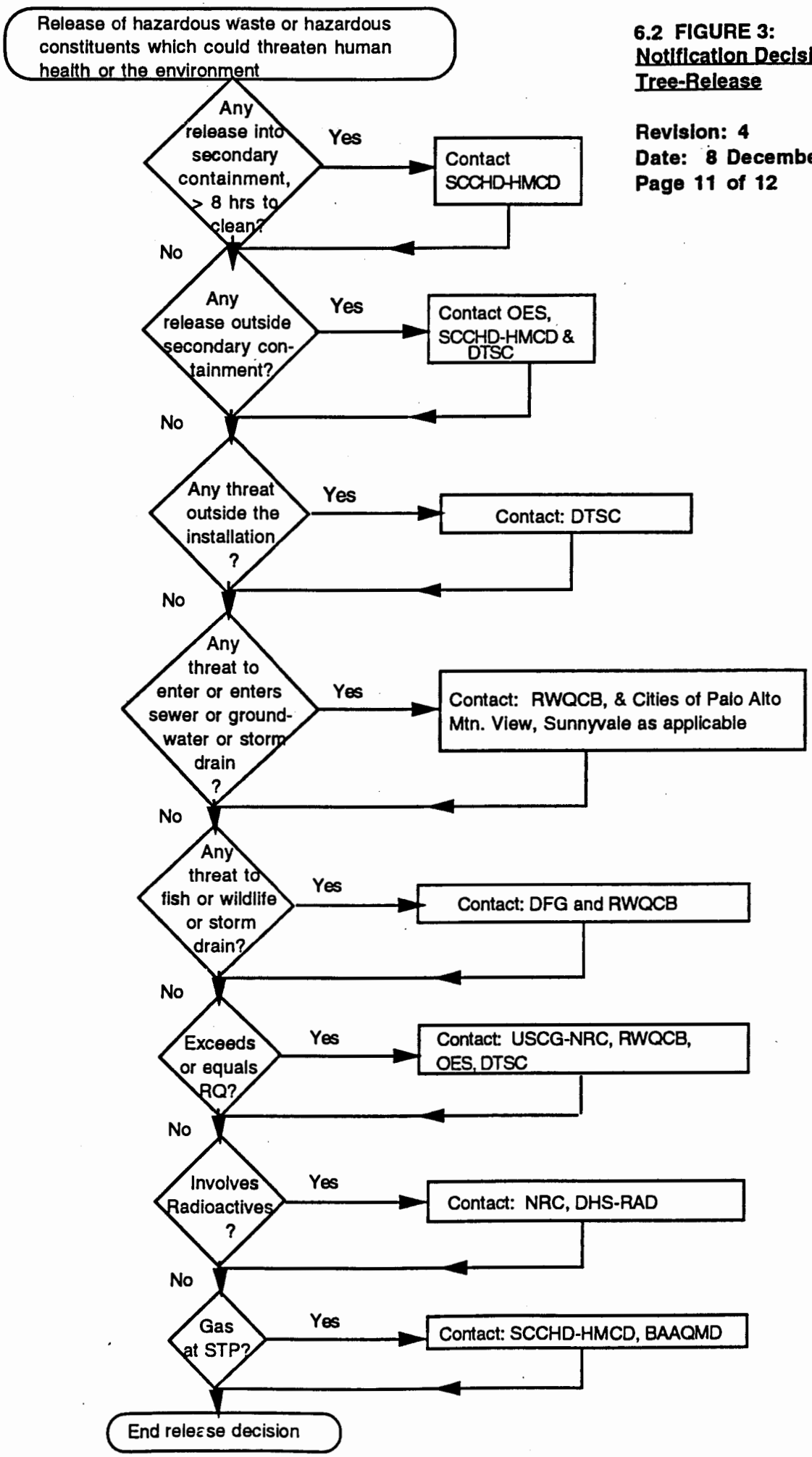
5.12.5 The list of emergency equipment changes.

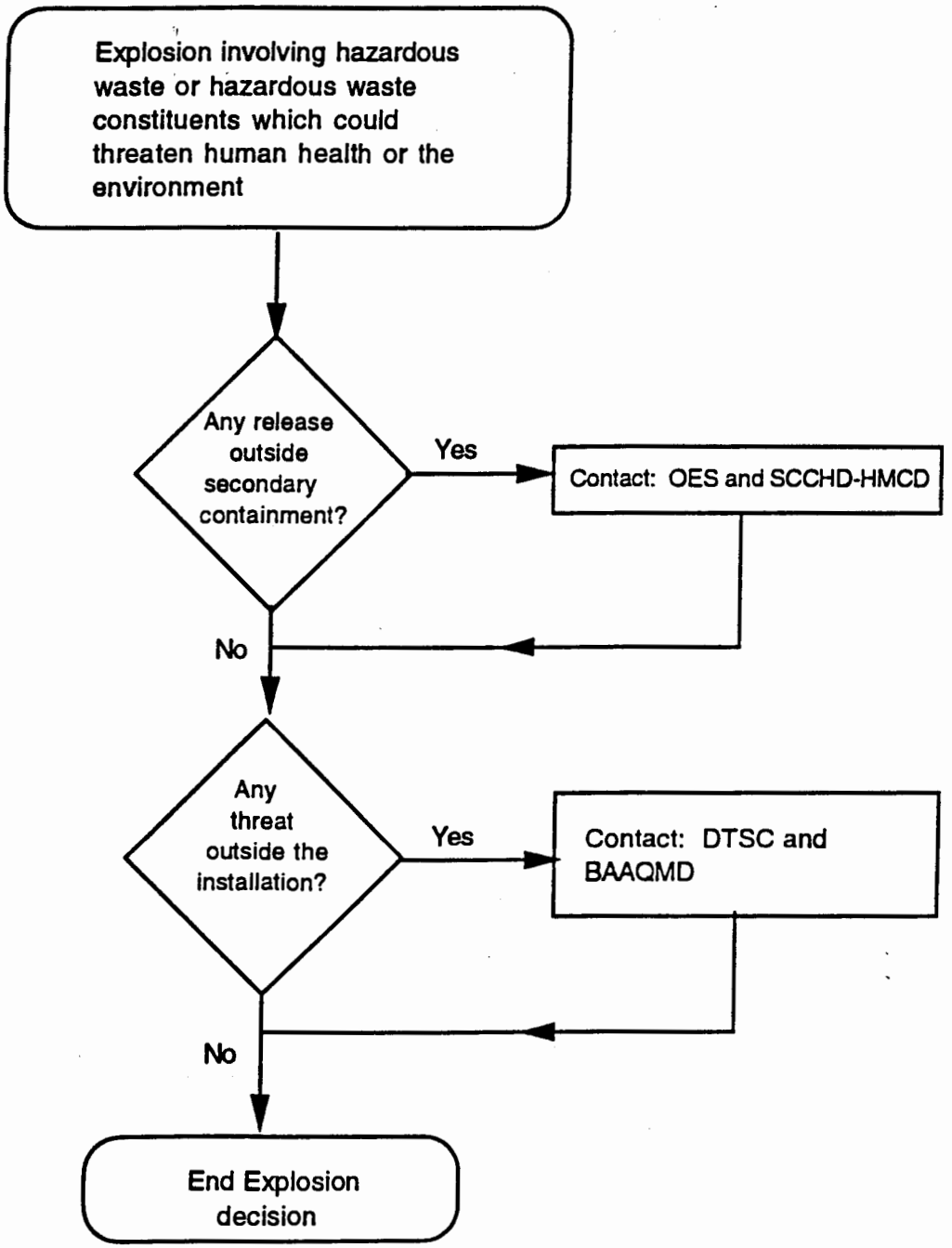

EMERGENCY
Per the BEAP personnel notify the Moffett Field Security Dispatch Office via Extension 9-1-1
The Moffett Field Security Dispatch Office per internal notification procedures notifies as required the following individuals/agencies
SAIC / Laidlaw
Site Emergency Spill Response Coordinator
CANG-FD
Moffett Field Security
Local Ambulance Service
Agency Notifications as Appropriate


Fire involving hazardous waste or hazardous waste constituents which could threaten human health or the environment
Any release outside secondary containment?
Yes
Contact: OES , SCCHD-HMCD and DTSC.
No
Any threat outside the installation?
Yes
Contact: DTSC and BAAQMD
No
Any threat to fish or wildlife or waters of state?
Yes
Contact: DFG
No
Run-off from response activities into sewer or storm drain?
Yes
Contact: RWQCB, City of Palo Alto, City of Mtn. View, and City of Sunnyvale as applicable
No
End fire decision

6.2 FIGURE 3:
Notification Decision Tree-Release

Revision: 4
Date: 8 December 1995




Explosion involving hazardous waste or hazardous waste constituents which could threaten human health or the environment
Any release outside secondary containment?
Yes
Contact: OES and SCCHD-HMCD
No
Any threat outside the installation?
Yes
Contact: DTSC and BAAQMD
No
End Explosion decision

SITE EMERGENCY SPILL COORDINATORS

Name	Address	Telephone/Pager
Sandra M. Olliges (primary)	340 Auburn Way #13 San Jose, CA 95129	415-604-3355/415-335-3616 408-246-5046 (Home)
Diane Shelander (alternate)	144 Eagle Crest Drive Scotts Valley, CA 95066	415-604-0921/415-335-3619 408-461-9476 (Home)
David King (alternate)	31052 Faircliff Street Hayward, CA 94544	415-604-1316 510-475-0751 (Home)
Michael Hulet (alternate)	16710 Wild Oak Way Morgan Hill, CA 95037	415-604-0268/415-335-3614 408-779-1688 (Home)

LAIDLAW ENVIRONMENTAL SERVICES INC.
EMERGENCY RESPONSE
SUPPLY INVENTORY

ITEM	NUMBER	LOCATION
Draeger SCBA	2	E.R. Van
Draeger SCBA spare bottles	2	E.R. Van
Portable Eyewash	1	E.R. Van
ABC,AFFF,D fire extinguishers	1	E.R. Van
First Aid Kit	1	E.R. Van
Air Horn	1	E.R. Van
Portable generator	1	Sea-Train #1
Portable lights	2	Sea-Train #1
Extension cord	1	E.R. Van
Wet/Dry Vacuum	1	E.R. Van
Soda Ash (25 lb.)	1	Sea-Train #1
Oil Dry (50 lb.)	6	E.R. Van
Brooms	2	E.R. Van
Small Wisk Broom	2	E.R. Van
Shovels-plastic	2	E.R. Van
Shovel-metal	1	E.R. Van
Drum Dolly	1	N265 Pad
Barricades	4	Sea-Train #1
"Caution" Tape (roll)	1	E.R. Van
"Danger" Tape (roll)	1	E.R. Van
Mercury Vacuum	1	E.R. Van
Mercury Vacuum Bags	2	E.R. Van
Mercury Spill Kit	1	E.R. Van
Jerome Mercury Vapor Analyzer	1	E.R. Van
Plastic Sheeting (roll)	2	E.R. Van
Plastic Garbage Bags (large)	8	E.R. Van
5 gal. plastic buckets	3	E.R. Van
Sample Jars (1 quart-glass)	4	E.R. Van
Sample Jars (1 quart-plastic)	4	E.R. Van
Sample Rods	4	E.R. Van
Plastic Hand Pump	2	E.R. Van
Plastic Scoops	2	E.R. Van
Hand Brushes.	2	E.R. Van

LAIDLAW ENVIRONMENTAL SERVICES INC.
EMERGENCY RESPONSE
SUPPLY INVENTORY

ITEM	NUMBER	LOCATION
5 Gallon Water/Gatorade	1	E.R. Van
Water Cooler	1	E.R. Van
55 gal. Drums (1A1)	2	E.R. Van
55 gal. Drum (1A2)	1	E.R. Van
85 gallon Overpack Drum	1	E.R. Van
Field Test Kit (see attached)	1	E.R. Van
Label Kit	1	E.R. Van
Tool Kit (see attached)	1	E.R. Van
Spill Pads	8	E.R. Van
Spill Pillows	4	E.R. Van
Spill Booms	4	E.R. Van
Plastic Trays	3	E.R. Van
Duct Tape (roll)	4	E.R. Van
Headbands	8	E.R. Van
Hard hats	4	E.R. Van
Face Shields	4	E.R. Van
Goggles	4	E.R. Van
Safety Glasses	4	E.R. Van
Ear Plugs	8	E.R. Van
Ear Muffs	4	E.R. Van
E.R. Bag with Phone	1	E.R. Van
Bleach (1 gallon)	1	E.R. Van
Bloodborne Pathogen Kit	2	E.R. Van
Baking Soda (1 lb.)	1	E.R. Van
Cloth Rags (packet)	3	E.R. Van
Cones	2	E.R. Van
Polaroid Camera/Film	1	E.R. Van
Vinegar (1 quart)	1	E.R. Van

LAIDLAW ENVIRONMENTAL SERVICES INC.
EMERGENCY RESPONSE
SUPPLY INVENTORY

ITEM	NUMBER	LOCATION
Reference Books	12	E.R. Van
Sax Dangerous Properties of Industrial Materials		
The Merck Index		
Hawley's Condensed Chemical Dictionary		
Niosh Pocket Guide to Chemical Hazards		
1993 Emergency Response Guidebook		
Chemical Protective Clothing		
Emergency Handling of Hazardous Materials		
Chemical Hazard Response Information System (CHRIS)		
Fire Protection Guide on Hazardous Materials		
Handbook of Compressed Gases		
Threshold Limit Values (ACGIH)		
Respirator Selection Guide		
Gloves		
Neoprene Gloves (packet)	2	E.R. Van
Nitrile Gloves N-Dex (packet)	8	E.R. Van
Silver Shields (pair)	8	E.R. Van
Kevlar Gloves (pair)	2	E.R. Van
Cotton Liner Gloves (packet)	3	E.R. Van
Leather Gloves (pair)	8	E.R. Van
Suits		
Type-A Interceptor	6	E.R. Van
Tyvek Suits (boxes)	2	E.R. Van
Polytyvek Suits (boxes)	2	E.R. Van
Saranex Suits (box)	1	E.R. Van
Rain Suits	2	E.R. Van

LAIDLAW ENVIRONMENTAL SERVICES INC.
EMERGENCY RESPONSE
SUPPLY INVENTORY

ITEM		NUMBER	LOCATION
MSA Cartridges	(Boxes)		
Mersorb		6	E.R. Van
GMA		2	E.R. Van
GMA-H		3	E.R. Van
GMB		1	E.R. Van
GMC		6	E.R. Van
GMC-H		6	E.R. Van
GMD		1	E.R. Van
GMD-H		1	E.R. Van
GME-H		2	E.R. Van
H		2	E.R. Van

Please note that additional supplies are located at the N265 Hazardous Waste Accumulation Area. Please see LES on-site personnel for assistance.

AGENCY NOTIFICATION CONTACTS

Agency	Location or Contact	Phone Number
BAAQMD	Director of Enforcement or Complaint Number Dispatcher	415-771-6000 415-749-4979 800-334-ODOR
DFG	Dispatch Office Region III	707-944-5500 (No 24-hour number) 707-944-5563 (fax)
DTSC	Duty Officer Region II	510-540-3739 (No 24-hour number)
DHS-Rad		916-391-7716
NRC	Office of Material Safeguards Region V	415-943-3700 415-943-3804 (fax)
OES	State Warning Center	800-852-7550 (24-hour number) 916-262-1621
RWQCB	San Francisco Bay Region	510-286-1255 510-286-3983 (24-hour answering machine-leave message)
SCCHD-HMCD	Deputy Officer	408-299-6930 (answering machine off-hours/ leave message)
USCG-NRC	Dispatch	800-424-8802 (24-hour number)

Agency	Location or Contact	Phone Number
Cal EPA	Emergency Release Reporting	916-324-3773
EPA Region IX	Toxic Waste Management	415-744-2074
City of Mountain View Utilities Department	Manager, Industrial Waste Discharge Monitoring Division Russ Fraser/Gary Leinweber	415-903-6329 415-903-6395 (Off-hours notification)
City of Sunnyvale Water Pollution Control Plant	Senior Wastewater Inspector Christopher de Groot	408-730-7273 (Off-hours allow phone to ring until picked-up)
Palo Alto Regional Water Quality Control Plant	Manager Phil Bobel Enviro. Compliance Division Manager/Javad Ghaffari	415-329-2518 415-329-2598 (24-hour number)

N265

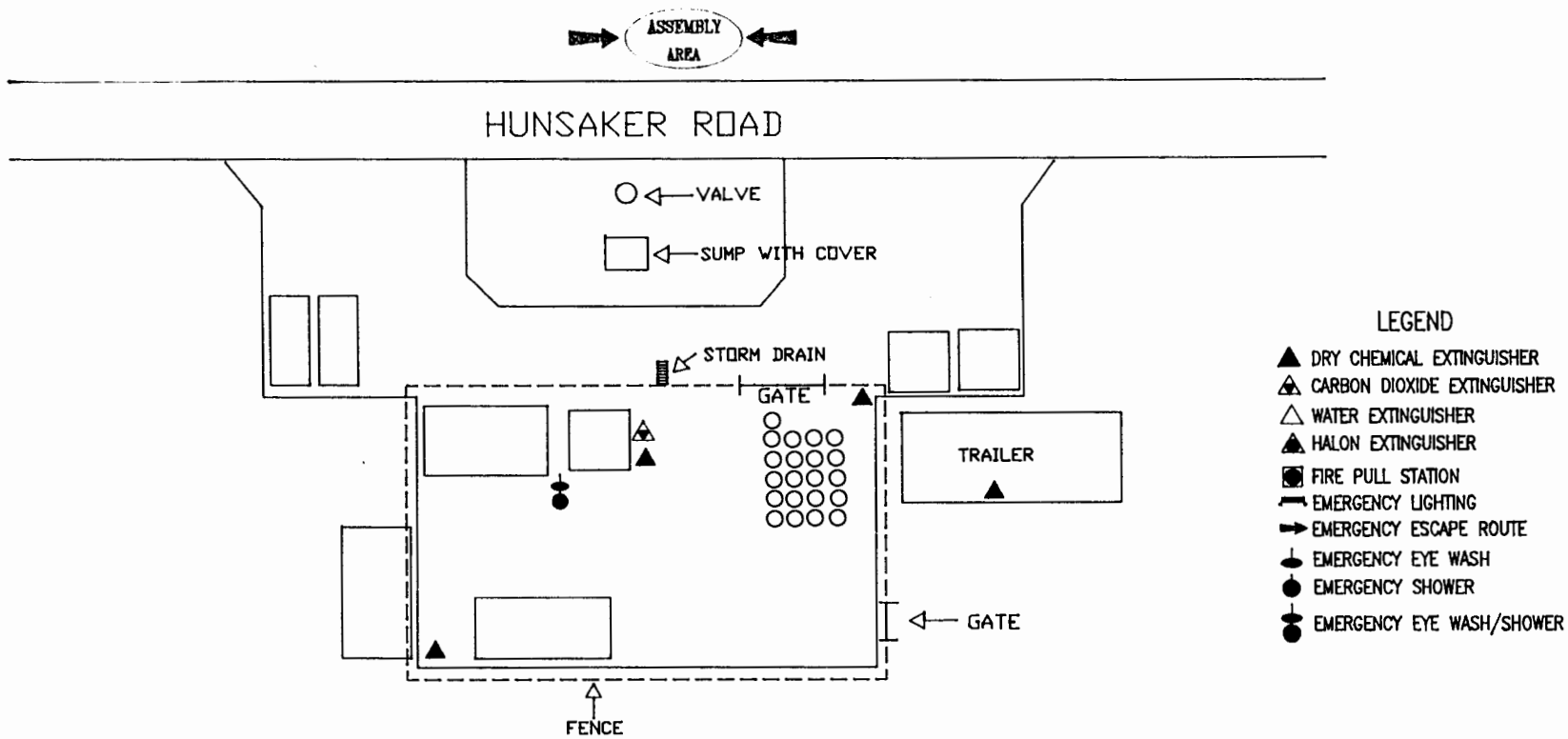
Building Emergency Action Plan

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, California

N-265

EMERGENCY EQUIPMENT AND EVACUATION MAP



NOTE: FENCED AREA IS COVERED

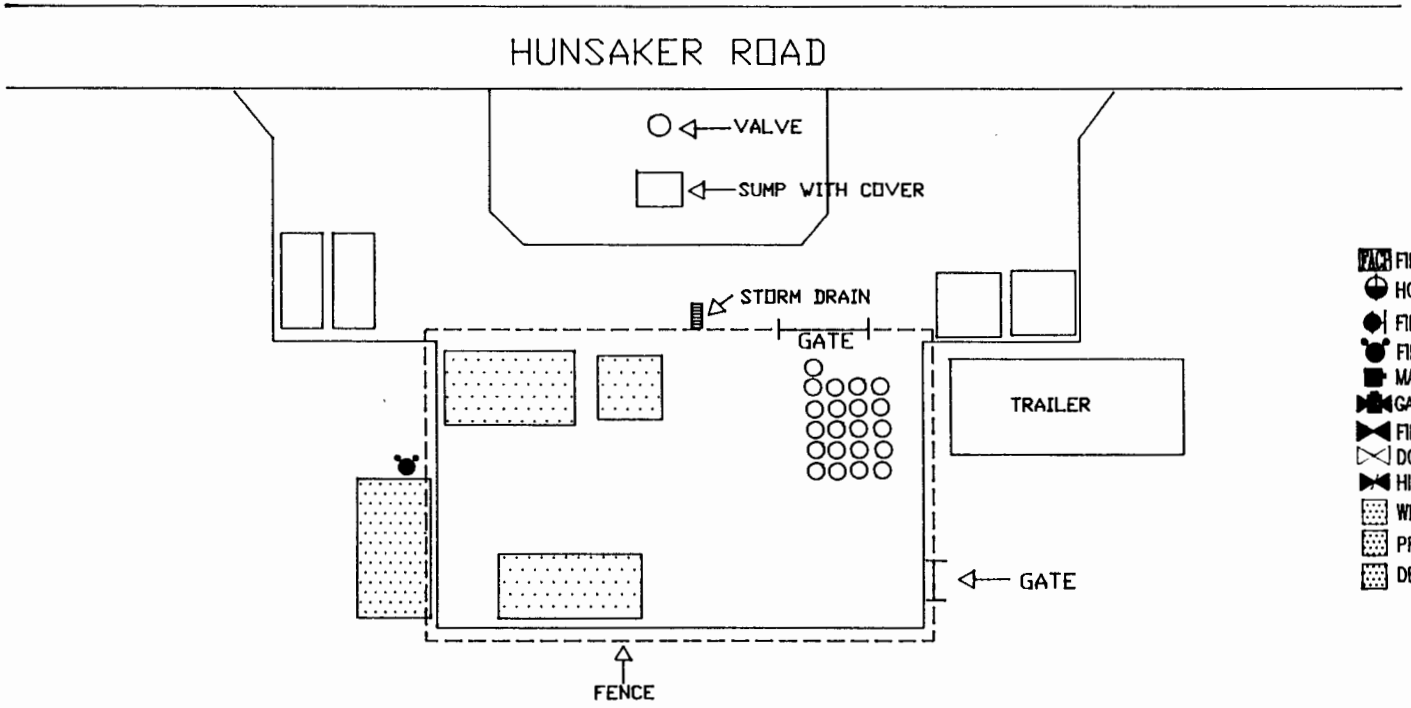
N

FLOOR	NET USABLE SQ. FT.
FIRST	24334
SECOND	6211
MEZZA	3746
TOTAL	34291

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	SCALE, FT.	DWG. NO.	REV	DATE	GROSS BLDG SQ FT	TITLE	BLDG. NO.
AMES RESEARCH CENTER MOFFETT FIELD, CALIFORNIA	MAP NOT TO SCALE	265-1-1	DQH	6/95	46426	HAZARDOUS WASTE ACCUMULATION AREA	N-265

N-265

EMERGENCY RESPONDER EQUIPMENT MAP



NOTE: FENCED AREA IS COVERED

LEGEND

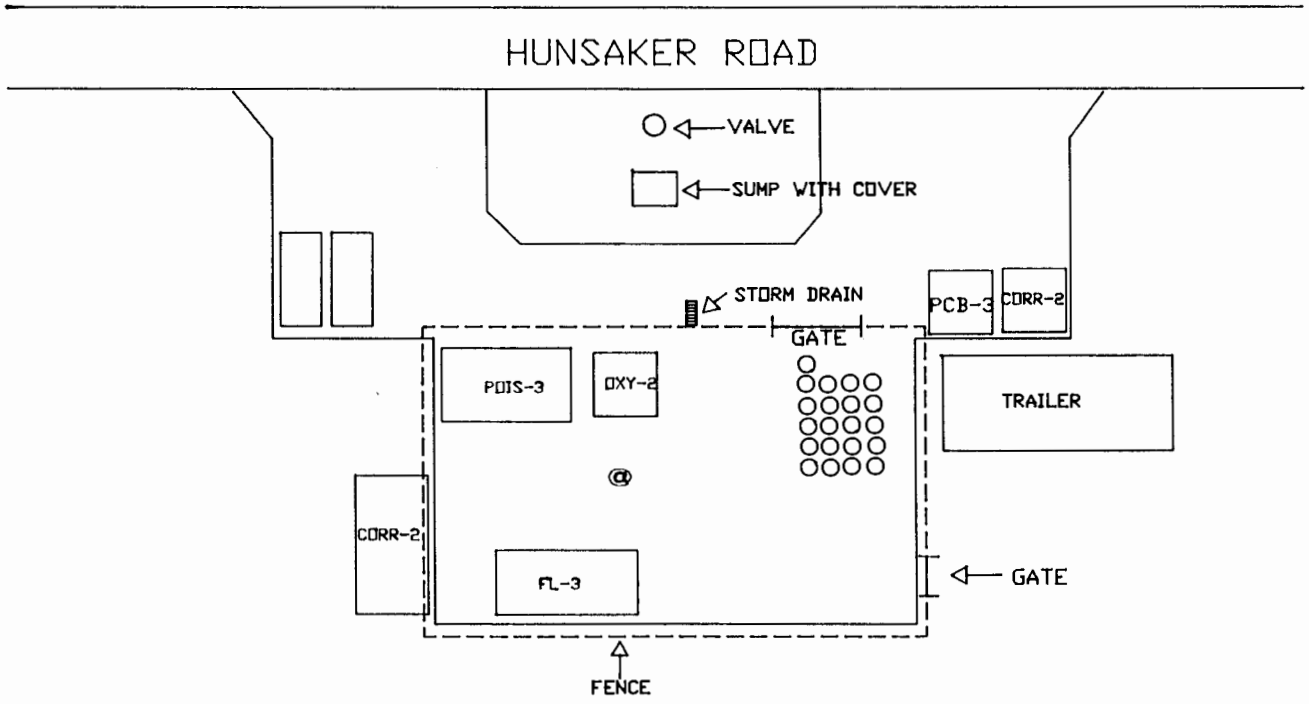
- FIRE ALARM CONTROL PANEL
- HOSE OUTLET (WITHOUT HOSE)
- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION
- MAIN ELELCTRICAL SHUT-OFF
- GAS MAIN SHUT-OFF VALVE
- FIRE WATER GATE VALVE
- DOMESTIC WATER GATE VALVE
- HIGH PRESSURE AIR VALVE
- WETPIPE SPRINKLER SYSTEM
- PRE-ACTION SPRINKLER SYSTEM
- DELUGE SPRINKLER SYSTEM

N

FLOOR	NET USABLE SQ. FT.
FIRST	24334
SECOND	6211
MEZZA	3746
TOTAL	34291

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	SCALE, FT.	DWG. NO.	REV	DATE	GROSS BLDG SQ FT	TITLE	BLDG. NO.
AMES RESEARCH CENTER MOFFETT FIELD, CALIFORNIA	MAP NOT TO SCALE	265-1-1	DQI	6/95	46426	HAZARDOUS WASTE ACCUMULATION AREA	N-265

N-265
CHEMICAL STORAGE LOCATIONS



NOTE: FENCED AREA IS COVERED

LEGEND

EXP-A	EXPLOSIVES CLASS A SEE BELOW FOR QUANTITY RANGES
EXP-B	EXPLOSIVES CLASS B SEE BELOW FOR QUANTITY RANGES
EXP-C	EXPLOSIVES CLASS C SEE BELOW FOR QUANTITY RANGES
FG	FLAMMABLE GAS SEE BELOW FOR QUANTITY RANGES
FL	FLAMMABLE LIQUID SEE BELOW FOR QUANTITY RANGES
CL	COMBUSTIBLE LIQUID SEE BELOW FOR QUANTITY RANGES
FS	FLAMMABLE SOLID SEE BELOW FOR QUANTITY RANGES
OXI	OXIDIZER SEE BELOW FOR QUANTITY RANGES
POIS	POISON SEE BELOW FOR QUANTITY RANGES
RAD	RADIOACTIVE SEE BELOW FOR QUANTITY RANGES
CORR S	CORROSIVE SOLID SEE BELOW FOR QUANTITY RANGES
CORR L	CORROSIVE LIQUID SEE BELOW FOR QUANTITY RANGES
ORM	MISC. OTHER REGULATED MATERIAL SEE BELOW FOR QUANTITY RANGES

QUANTITY RANGES:

1 >55 gallons/500lbs/2,000cf@stp
2 >550 gallons/5,000lbs/10,000cf@stp
3 >2,700 gallons/25,000lbs/10,000cf@stp
4 >5,000 gallons/50,000lbs/20,000cf@stp
5 <5,000 gallons/50,000lbs,20,000cf@stp

✳ FLOOR DRAIN

STORM DRAIN

@ SPILL RESPONSE SUPPLIES

N

FLOOR	NET USABLE SQ. FT.
FIRST	24334
SECOND	6211
MEZZA	3746
TOTAL	34291

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	SCALE, FT.	DWG. NO.	REV	DATE	GROSS BLDG SQ FT	TITLE	BLDG. NO.
AMES RESEARCH CENTER MOFFETT FIELD, CALIFORNIA	MAP NOT TO SCALE	265-1-1	DQP	6/95	46426	HAZARDOUS WASTE ACCUMULATION AREA	N-265

Recent Spill Reports to Regulatory Agencies

(9 Reports from 1995/6)

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, CA 94035-1000

1 2 MAR 1996

Reply to Attn of:

DQH:19-1

Bob Holston
County of Santa Clara
Department of Environmental Health
Hazardous Materials Compliance Division
P.O. Box 28070
San Jose, CA 95159-8070

Dear Mr. Holston:

Per your request, NASA-Ames Research Center (ARC) notified your office by telephone on Thursday, March 8, 1996, of a JP8 fuel release at the N211 Fuel Systems Repair Construction project that occurred the same day. A brief description of the incident is provided below.

SPILL DESCRIPTION

Date of Spill:	Thursday, March 7, 1996
Time of Discovery:	Reported to Ames Office of Safety, Health and Environmental Services at approximately 1:20 PM
Substance Spilled:	JP8 fuel
Location:	N211 Fueling System Repair Project
Quantity Spilled:	1 to 5 gallons (estimated)
Spill Dimensions:	Asphalt stained area was approximately 10 feet x 10 feet.
Incident Description:	Contractors performing a pressure test on a fuel piping system for the Aircraft Fuel Systems Repair Project spilled JP8 onto the asphalt pavement adjacent to the fueling cabinet nearest Zook Road. Workers were removing fuel from the piping system by pumping fuel through a garden hose into an open poly containment tray when the hose end fell out of the tray and onto the asphalt pavement.

SPILL RESPONSE

Upon notification of the spill, the NASA Safety Office responded to the incident as described on the following page.

Time	Response Description
1:20 PM	Bob Holston discovered spill during observation of pressure testing and notified DQH of the spilled fuel.
1:30 PM	Sandy Olliges notified Diane Shelander who in turn notified SAIC.
1:45 PM	SAIC arrived at the incident location and met with Trish Morrissey, Code JE, and Bob Holston. Diane Shelander was also on scene. Bob Holston and Trish Morrissey provided SAIC with the spill information. SAIC informed the contractor that the fuel would need to be transferred to sealed drums and moved from the site. The spilled fuel was contained on the asphalt pavement. No free product was on the asphalt or adjoining surface areas. Soil was not impacted.
1:50 PM	Laidlaw arrived at the incident location with two 55-gallon drums for containerizing the fuel that had been pumped into the open tray and two poly over-pack drums. D. Winningham retrieved two more empty drums after assessing the volume of fuel that needed to be transferred.
2:00 PM	Contractors began transferring fuel with a small pump from one of the over-pack drums into a 55-gallon steel closed top drum provided by Laidlaw.
2:20 PM	SAIC left scene.
3:00 PM	Laidlaw left the scene with three 55-gallon drums of JP8. Laidlaw left two bags of absorbent and some spill pads with the contractor at the spill site.
3:00 PM	Diane Shelander notified the County of the spill by telephone.

In response to the inspection notice your prepared at the incident location, NASA is working on a written procedure for construction work to prevent spills of this nature and will provide you a copy including a summary of the corrective actions taken when completed.

Should you require additional information regarding the spill, please call me at (415) 604-0921.

Respectfully,

Diane Shelander

Diane Shelander
Environmental Program Manager (Acting)

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, CA 94035-1000

DQH:218-1

JAN 10 1996

Reply to Attn of:

Coreen Battany
County of Santa Clara
Department of Environmental Health
Hazardous Materials Compliance Division
P.O. Box 28070
San Jose, CA 95159-8070

Dear Ms. Battany:

As required by Part VI. Section B11-306.01(A)(1)(b) of the County Hazardous Materials Storage Permit Ordinance, the following information is being reported to your department.

On Monday, December 4, 1995, NASA personnel observed a release of diesel fuel at Gate 14B (North Perimeter Road). Details of the spill and measures taken in response to the incident are described below as they were discussed with Ms. Christine Moore of your department December 4, 1995.

SPILL DESCRIPTION

Date/time Discovered:	12-4-95 at 3:00 pm;
Date Cleanup began:	12-4-95;
Notifications:	Santa Clara County Health Department: 4:00 pm,
December 4, 1995	Office of Emergency Services: # 01171; 4:05pm
	Cliff Cahee, Regional Water Quality Control Board: 4:05 pm
	Petty Officer Suyat, US Coast Guard: 4:10 pm,
Substance:	Diesel Fuel;
Quantity:	Fifty (50) gallons;
Location:	Gate 14B;
Cause:	Fuel spilled from lines that had been disconnected from the tank;
Environment Affected:	Soil and storm drainage channel;
Injuries:	No injuries or evacuations.

SPILL RESPONSE:

At 3:00 pm on 12-4-95 NASA discovered a diesel spill at Gate 14B (North Perimeter Road). The spill originated from lines connecting a generator to an aboveground tank, which had been disconnected to service the pumps. Approximately 50 gallons of diesel leaked onto the base rock. The diesel migrated through the base rock. A quantity of the diesel entered the storm drain channel, resulting in surface sheen. Approximately four tenths of a mile of the channel (from Gate 14B to B191) was impacted. The contaminated water was subsequently pumped from B191 to the adjacent channel.

Based on Cliff Cahee's (RWQCB) previous request to place spill response equipment at the B191 lift station in response to a spill from Tank 105 last summer, NASA Ames Research Center was able to respond quickly to the this spill thereby minimizing the impact.

The following is a detailed sequence of events:

<u>12-4-95</u>

3:00 pm: NASA personnel observed an oily sheen on the water in the storm drain channel. Upon further investigation the source of the sheen was located at Gate 14B.

3:04 pm: Spill response was initiated which included the following actions:
- Pumps located in B191 were shut down and locked out.
- The affected area of the storm drain channel was isolated.
- Booms and pig mats were installed in contaminated areas.

4:00 pm: Appropriate agency notifications were made.

4:00 pm: Soil samples were taken along the storm drain channel directly west of Gate 14B. Excavation of contaminated base rock began.

4:15 pm: An oily sheen was found bubbling from an area directly east of Gate 14A, located at the east end of North Patrol Road. This appeared to be from another source not related to the diesel spill. Booms were installed at this location.

5:15 pm: Water samples were taken at both Gate 14A and B191.

12-5 through 12-7-95

Spill response continued with the addition of vacuum removal of remaining sheen.

12-8-95

Spill response continued.

3:30 pm: Cliff Cahee from the Regional Water Quality Control Board (RWQCB) inspected the spill location and the area around Gate 14A. He felt the response action had been conducted correctly, and made the following requests:

- Remove as much soil as possible from the contaminated areas at Gate 14B.
- After the completion of soil excavation place at least double layered booms across the channel and inspect them periodically until no further product is desorbing.
- Regarding the sheen at Gate 14A, move the western boom closer to the affected area. Mr. Cahee understood that this contamination may be the result of former Navy or DFSP operations, and has allowed time for an investigation of the situation.

CORRECTIVE ACTIONS:

Corrective actions required based on this release are discussed below.

- The spill response supplies at the B191 lift station have been replaced.
- Booms have been installed and will be inspected and replaced as required.
- Excavation of contaminated soil will continue.

A final report will be issued when all corrective actions have been completed.

Should you require additional information or have any questions regarding this incident, please call me at (415) 604-3355.

Respectfully,

Sandy Olliges
Environmental Program Manager

cc: Cliff Cahee, RWQCB
Bob Holston, SCCHD
Stephen Chao, Navy EFA West

19-11/K. Kasser
19-21/L. Vrabel
19-21/J. Moudy
19-21/S. Phillips
19-21/P. Yimbo

SMOlliges:smo/43355/1-10-96

National Aeronautics and
Space Administration
Ames Research Center
Moffett Field, CA 94035-1000

Reply to Attn of: DQH:218-1

DEC 01 1995

Coreen Battany
County of Santa Clara
Department of Environmental Health
Hazardous Materials Compliance Division
P.O. Box 28070
San Jose, CA 95159-8070

Dear Ms. Battany:

As required by Part VI. Section B11-306.01(A)(1)(b) of the County Hazardous Materials Storage Permit Ordinance, the following information is being reported to your department.

On November 14, 1995, transformer T44 at Building N227 was observed to be leaking. This was reported to the NASA-Ames environmental office on November 28, 1995. Details of the spill and measures taken in response to the incident are described below as they were discussed with Ms. Christine Moore of your department on November 28, 1995.

SPILL DESCRIPTION

Date Discovered: 11-14-95
Notifications: 1) Christine Moore, SCCHD: 1:30 PM, November 28, 1995, Santa Clara County Health Department;
2) Office of Emergency Services: 11-28, 1:25 PM, OES #011079;
Substance: Transformer oil with 4 ppm of PCBs;
Quantity: One-half (0.5) gallon;
Location: N227;
Cause: Leaking transformer;
Environment Affected: Adjacent soil;
Injuries: No injuries or evacuations.

SPILL RESPONSE:

On November 14, 1995, transformer T44 at N227 was observed to be leaking. This was reported to the NASA-Ames environmental office on November 28, 1995. At that time it appeared that approximately 1/2 gallon of oil had dripped onto the concrete pad below the transformer. In addition, a minor amount of oil discharged onto the exposed soil adjacent to the concrete pad.

The oil contains 4 ppm PCBs. Response actions taken on November 28, 1995 included absorbing the free liquid, and placing absorbent material and a bucket to

catch potential drips. On November 29, 1995 excavation of contaminated soil began. Confirmation samples will be collected when all visibly contaminated soil has been removed.

CORRECTIVE ACTIONS:
The transformer will be repaired or replaced. Upon completion of corrective actions a final report will be submitted.

Should you require additional information or have any questions regarding this incident, please call me at (415) 604-3355.

Respectfully,

Sandy Olliges

Sandy Olliges
Environmental Program Manager

cc: Bob Holston, SCCHD

19-21/L. Vrabel
19-21/S. Phillips
19-11/K. Kasser
213-8/T. Morrissey
227-5/R. Ashford

SMOlliges:smo/43355/12-1-95

National Aeronautics and
Space Administration
Ames Research Center
Moffett Field, CA 94035-1000

DQH:218-1

Reply to Attn of:

OCT 13 1995

Coreen Battany
County of Santa Clara
Department of Environmental Health
Hazardous Materials Compliance Division
P.O. Box 28070
San Jose, CA 95159-8070

Dear Ms. Battany:

As required by Part VI. Section B11-306.01(A)(1)(b) of the County Hazardous Materials Storage Permit Ordinance, the following information is being reported to your department.

On Friday, October 6, 1995, a release of transmission fluid was observed from a forklift in the asphalt parking area of Building 525. Further investigation revealed the product had reached a nearby storm drainage catch basin. Details of the spill and measures taken in response to the incident are described below as they were reported to Ms. Jeanne Fortin of your department on October 6, 1995.

SPILL DESCRIPTION

Date/time:	10/6/95; 2:14 PM
Notifications:	1) Jeanne Fortin, SCCHD: 3:35 PM, October 6, 1995, Santa Clara County Health Department 2) Office of Emergency Services: 3:30 PM, OES #010390, October 6, 1995 3) 3:40 Left on Cliff Cahee's voice mail, Regional Water Quality Control Board: 3:40 PM, October 6, 1995;
Substance:	Transmission fluid;
Quantity:	Two (2) gallons;
Location:	Bldg. 525 parking lot;
Cause:	Release of transmission fluid from forklift;
Environment Affected:	Asphalt parking lot and storm drainage basin (1 gallon flowed into the storm drainage catch basin);
Injuries:	No injuries or evacuations.

SPILL RESPONSE:

Transmission fluid leaked from a forklift in the parking lot in front of Building 525. Approximately two (2) gallons flowed across the parking lot toward the storm drain, approximately one (1) gallon flowed into the storm drainage catch basin. Spill response personnel absorbed the fluid from the parking lot and the storm drainage basin. A sample of the water remaining in the storm drain catch basin was collected for subsequent analysis at a State Certified Hazardous Waste Testing Laboratory for oil and grease. No fluid escaped from the catch basin into the storm drainage system.

CORRECTIVE ACTIONS:

The forklift was taken in for servicing.

Should you require additional information or have any questions regarding this incident, please call me at (415) 604-3355.

Respectfully,

Sandy Olliges

Sandy Olliges
Environmental Program Manager

cc: Cliff Cahee, RWQCB
Bob Holston, SCCHD
Jerry Reid, Onizuka

cc:
19-21/L. Vrabel
19-21/S. Phillips
19-21/T. McMahon
19-1/D. Shelander

SMOlliges:smo/43355/10-13-95

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, California 94035-1000

S. Phillips

NASA

Reply to Attn of: DQH:218-1

11 SEP 1995

Coreen Battany
County of Santa Clara
Department of Environmental Health
Hazardous Materials Compliance Division
P.O. Box 28070
San Jose, CA 95159-8070

Dear Ms. Battany:

As required by Part VI. Section B11-306.01(A)(1)(b) of the County Hazardous Materials Storage Permit Ordinance, the following information is being reported to your department.

On Friday, September 1, 1995, an automobile was releasing gasoline onto the asphalt parking area of Building 19. Further investigation revealed the product was approaching a nearby storm drainage catch basin. Details of the spill and mitigation measures taken in response to the incident are described below as they were discussed with Ms. Christine Moore of your department on September 1, 1995.

SPILL DESCRIPTION

Date/time:	9/1/95; 4:00 pm
Notifications:	1) Christine Moore, Santa Clara County Health Department - 4:15 pm, September 1, 1995; 2) Office of Emergency Services: Control No. 009847, - 4:20 pm, September 1, 1995; 3) Cliff Cahee, Regional Water Quality Control Board - 4:25 pm, September 1, 1995;
Substance:	Unleaded gasoline;
Location:	Asphalt parking area and catch basin in Bldg. 19;
Quantity:	approximately 1-2 gallons;
Cause:	Leak in fuel tank

SPILL RESPONSE:

The product on the asphalt was cleaned up. The storm drainage catch basin's grate was removed. Gasoline was observed to be floating on the water contained in the bottom of the catch basin. Approximately 2 inches of fluid was observed in the bottom of the catch basin. All of the liquid in the catch basin was absorbed and drummed for disposal as a hazardous waste.

Since the exit pipe from the storm drainage catch basin was 12 inches higher than the base of the catch basin and only 2 inches of fluid was encountered, the spill did not flow into the storm drainage system.

CORRECTIVE ACTIONS:

The fuel tank of the automobile was repaired on Friday, September 1, 1995.

Should you require additional information or have any questions regarding this incident, please call me at (415) 604-3355.

Respectfully,

Sandy Olliges
Environmental Program Manager

cc: Cliff Cahee, RWQCB
Bob Holston, SCCHD
19-21/L. Vrabel
19-21/T. McMahon
19-21/S. Phillips

SMOlliges:smo/43355/9-14-95

National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, CA 94035-1000

AUG 03 1995

Reply to Attn of: DQH:218-1

Coreen Battany
County of Santa Clara
Department of Environmental Health
Hazardous Materials Compliance Division
P.O. Box 28070
San Jose, CA 95159-8070

Dear Ms. Battany:

As required by Part VI. Section B11-306.01(A)(1)(b) of the County Hazardous Materials Storage Permit Ordinance, the following information is being reported to your department.

During a routine inspection on June 30, 1995, fuel was noticed in the secondary containment of the day tank at Building (B/) 105 of Moffett Federal Airfield. Further investigation revealed that the material had leaked from the secondary containment and onto the concrete pad/soil. Details of the spill and measures taken in response to the incident are described below as they were discussed with Mr. Bob Holston of your department on July 5, 1995.

SPILL DESCRIPTION

Date/time:	The spill was discovered on July 5, 1995/approximately noon.
Notifications:	1) Coreen Battany, Hazardous Materials Compliance Division - 10:55 AM, July 26, 1995; 2) Office of Emergency Services: Control No. 009248, - 11:00 AM, July 26, 1995; 3) Cliff Cahee, Regional Water Quality Control Board - 11:05 AM, July 26, 1995;
Substance:	Diesel;
Location:	Concrete pad/Soil adjacent to the day tank at B/105;
Quantity:	approximately 10 gallons;
Cause:	Faulty valve/tank connection.

SPILL RESPONSE:

Product from the secondary containment structure and concrete pad was removed in addition to approximately 10 ft^3 (<1 yd^3) of contaminated soil. All spill residue and clean-up material were properly disposed of at an off-site hazardous waste facility. None of the fuel reached storm or sanitary sewer systems; the spill was contained within the immediate area. All phases of the clean-up were performed by contractor staff familiar with spill response/clean-up requirements. Soil samples were collected and submitted to laboratory to verify adequate soil removal. Copies of the results will be forwarded to your office.

CORRECTIVE ACTIONS:

The pipe connection on the day tank was refitted to prevent further leaks. Additionally, onsite personnel were briefed on internal reporting requirements to ensure more timely reporting to your office.

Should you require additional information or have any questions regarding this incident, please call me at (415) 604-3355.

Respectfully,

Sandy Olliges

Sandy Olliges
Environmental Program Manager

cc: Cliff Cahee, RWQCB
Bob Holston, SCCHD

19-1/S. Navarro
19-21/S. Phillips
19-21/C. Soles
19-11/K. Kasser

SMOlliges:smo/43355/8-3-95

National Aeronautics and
Space Administration
Ames Research Center
Moffett Field, CA 94035-1000

DQH:218-1

Reply to Attn of:

JUL 10 1995

Coreen Battany
County of Santa Clara
Department of Environmental Health
Hazardous Materials Compliance Division
P.O. Box 28070
San Jose, CA 95159-8070

Dear Ms. Battany:

As required by Part VI. Section B11-306.01(A)(1)(b) of the County Hazardous Materials Storage Permit Ordinance, the following information is being reported to your department. On June 22, 1995, NASA-Ames Research Center (ARC) experienced a release of transformer oil that was contained within our N-227D Substation. Details of the spill and measures taken in response to the incident are described below.

SPILL DESCRIPTION:

Date:	Thursday, June 22, 1995;
Time:	Approximately 8:00AM;
Notification:	• Coreen Battany, Hazardous Materials Compliance Division - 12:00PM, Thursday, June 22, 1995; • Waynette Armas, Office of Emergency Services, Report #008848 - 3:22PM, Monday, June 26, 1995
Substance:	Mineral oil with 13 ppm PCBs;
Quantity:	Approximately 35 gallons of mineral oil and less than 1 pound PCBs by weight;
Location:	Outside, onto gravel/soil and concrete slab beneath oil reservoir tank on the north side of Transformer (T-) 46 located within the N-227D Substation (Figure 1);
Cause:	Cooling pump failed resulting in overheated transformer and leaking/overflowing mineral oil from a reservoir tank.

SPILL RESPONSE:

On June 22, 1995, all gravel that appeared to be contaminated was removed and the stained concrete was washed/double rinsed as required by 40 CFR 761.123. All spill residue was containerized for proper transportation and disposal offsite at a permitted hazardous waste facility. Clean-up was conducted by spill response team members from LAIDLAW/USPCI Environmental Services. On June 29, 1995, a sample of the remaining gravel/soil at the spill location and a wipe sample from the concrete was conducted. Results of the sampling event follow.

RESULTS:

Sample Description	Analyte	Detection Limit	Result	Clean-up Level
Wipe Sample*	PCB 1260	0.50 µg/wipe	0.58 µg/wipe	Not Applicable**
Soil Sample	PCB 1260	20 µg/kg	140 µg/kg	1 mg/Kg***

*Wipe sample as defined by standard wipe tests - 100 cm^2
**40 CFR 761.125(b)(i) - Spills of low concentration PCBs (i.e., less than 500 ppm) involving less than 1 pound of PCBs by weight - no clean-up level prescribed
***40 CFR 761.125(b)(ii)- Spills of low concentration PCBs (i.e., less than 500 ppm) involving less than 1 pound of PCBs by weight

According to 40 CFR 761.125(b)(i) and 40 CFR 761.123, spills of low concentration PCBs (i.e., less than 500 ppm) involving less than 1 pound of PCBs by weight, must be double washed/rinsed from solid surfaces using an amenable solvent. No clean-up level is prescribed. However, for reference purposes only, the clean-up level for spills of low concentration PCBs involving more than 1 pound of PCBs by weight is 100 µg/wipe. The analytical result for the wipe sample taken from concrete on the north side of T-46 is clearly below this clean-up level.

As indicated by 40 CFR 761.125(b)(ii), clean-up levels for spills of low concentration PCBs to soil involving less than 1 pound of PCBs by weight is 1 ppm (mg/Kg). The analytical result for the sample taken from the soil on the north side of T-46 is clearly below this clean-up level.

Copies of analytical results for the samples collected in response to this spill in addition to analytical results showing PCB concentrations of the mineral oil within T-46 are included as Attachment 1.

Should you require additional information or have any questions regarding this incident, please call me at (415) 604-3355 or Tom Cooper (415) 604-6295.

Respectfully,

Sandy Olliges

Sandy Olliges
Environmental Program Manager

Enclosure

cc:
19-21/T. Cooper
19-21/S. Phillips
19-21/J. Moudy
19-1/L. Nicholson
213-8/T. Morrissey
227-5/R. Ashford

National Aeronautics and
Space Administration
Ames Research Center
Moffett Field, CA 94035-1000

Reply to Attn of DQH:218-1

JUL 06 1995

Coreen Battany
County of Santa Clara
Department of Environmental Health
Hazardous Materials Compliance Division
P.O. Box 28070
San Jose, CA 95159-8070

Dear Ms. Battany:

As required by Part VI. Section B11-306.01(A)(1)(b) of the County Hazardous Materials Storage Permit Ordinance, the following information is being reported to your department. On June 26, 1995, NASA-Ames Research Center (ARC) experienced an estimated 1 gallon spill of aircraft fuel. Details of the spill and measures taken in response to the incident are described below.

SPILL DESCRIPTION

Date:	Monday, June 26, 1995;
Time:	Approximately 3:00PM;
Notification:	• Jeanne Fortin, Hazardous Materials Compliance Division - 9:20AM, Tuesday, June 27, 1995; • Office of Emergency Services Report #008861- 9:25AM, Tuesday, June 27, 1995
Substance:	JP-8 Aircraft Fuel;
Quantity:	Approximately 1 gallon;
Location:	Outside, onto gravel beneath pipe flange at N-211 Fuel Farm;
Cause:	Pipe flange failed causing minor leak.

Affected gravel was removed by LAIDLAW/USPCI Environmental Services and the pipe flange was repaired by on-site maintenance personnel before 5:00PM June 26, 1995. All spill residue was containerized for proper transportation and disposal.

Should you require additional information or have any questions regarding this incident, please call me at (415) 604-3355 or Tom Cooper (415) 604-6295

Respectfully,

Sandy Olliges
Environmental Program Manager

National Aeronautics and
Space Administration
Ames Research Center
Moffett Field, CA 94035-1000

Reply to Attn of: DQH:218-1

MAY 0 1 1995

Coreen Battany
County of Santa Clara
Department of Environmental Health
Hazardous Materials Compliance Division
P.O. Box 28070
San Jose, CA 95159-8070

Dear Ms. Battany:

As required by Part VI. Section B11-306.01(A)(1)(a)(ii) of the County Hazardous Materials Storage Permit Ordinance, the following information is being reported to your department. On April 21, 1995, NASA-Ames Research Center (ARC) experienced a spill of gear oil. Although none of the gear oil escaped to the environment, the clean-up was delayed longer than 8 hours. Details of the spill and measures taken in response to the incident are described below.

SPILL DESCRIPTION

Date:	Friday, April 21, 1995;
Time:	Reported to NASA environmental staff at 3:05 PM upon discovery;
Notification:	Coreen Battany, Hazardous Materials Compliance Division - 4:05 PM, Friday, April 21, 1995;
Substance:	Gear oil;
Quantity:	30-40 gallons;
Location:	Inside Oil House #1 (Bldg. 227A) on rigid, intact concrete floor (no floor drains present);
Cause:	Pipe fitting was loosened on a piece of equipment that contained a full reservoir of oil.

As previously indicated, all of the gear oil was contained within the Oil House and none of the oil was released to the environment. Due to the time of the spill discovery and the fact that the material was safely contained within the Oil House, initial spill response was delayed until the following morning.

SPILL RESPONSE:

On April 22, 1995, the bulk of the oil was cleaned up using a drum pump, absorbent spill pillows and clay absorbent. Two contractors familiar with the Oil House completed the first phase of the clean-up within 3 hour after arriving on the scene. On Monday, April 24, 1995, the spent spill clean-up materials and remaining residue was removed and properly containerized and disposed of.

CORRECTIVE ACTION:

In order to preclude recurrence the Oil House will remain locked and will only be accessible by key personnel. Additionally, oil reservoirs will be drained prior to maintenance activities that require loosening of pipe fittings.

Should you require additional information or have any questions regarding this incident, please call me at (415) 604-3355 or Tom Cooper at (415) 604-6295.

Respectfully,

Sandy Olliges

Sandy Olliges
Environmental Program Manager

cc:
213-15/G. Sutton
19-21/T. Cooper
19-21/S. Phillips
226-3/K. Winkelbrandt
213-26/D. Bufton

SMOlliges:smo/tmw/43355/5-1-95

H

COMPLETED INSPECTION LOGS
ACCUMULATION AREAS

• Inspection logs are maintained for both hazardous waste accumulation facilities at ARC: Building 498 on located between Hangars 2 and 3, and Building 265 located on Hunsaker Road.

• In accordance with a request made during the April 11, 1996 RCRA inspection the following pages show logs sheets which identified a problem. Pages E-1 and E-2 are copies of inspection logs which identified a leaking safety shower/eye wash unit at Building 498. It should be noted that the shower and eye wash were functional in spite if the leak.

• A service request was submitted by the ARC Safety Office to the Plant Engineering branch to repair the leaking equipment. The repairs were made in August 1994.

• Page E-3 is a copy of an inspection log which shows that a worn inspection tag was replaced.

NASA AMES RESEARCH CENTER
NAVY HAZARDOUS WASTE STORAGE FACILITY
DAILY INSPECTION LOG

1994 — July

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Emergency Eyewash/Shower OK (West side) (Y/N)	Y			Holiday	Y	Y	Y	Y			Y	Y	Y		Y			Y		Y		Y			Y				Y*		
Emergency Eyewash/Shower OK (East side) (Y/N)	Y				Y	Y	Y	Y			Y	Y	Y		Y			Y		Y		Y			Y				Y*		
All Locks Secure (Y/N)	Y				Y	Y	Y	Y			Y		Y		Y			Y		Y		Y			Y				Y		
General Condition of Hazardous Waste Containers OK (Y/N)	Y				Y	Y	Y	Y			Y		Y		Y			Y		Y		Y			Y				Y		
All Containers Secure and in Good Condition (Y/N)	Y				Y	Y	Y	Y			Y		Y		Y			Y		Y		Y			Y				Y		
Inspector's Initials/Time	AH 1024				AH 1030	AH 1015	AH 1000	AH 1000			AH 1030		AH 1000		AH 1000			AH 1015		AH 1000		AH 1030			AH 1030				DMW 1010		

Comments: (All sections with a "N" Indicated must be commented on in this section)

* 7/29/94 Eyewash Shower pipe has a 1½" crack in it Water sprays out, although pressure at shower is good.

Inspector: Al Hernandez (AH) / Dan Winningham (DMW)

Title: Hazardous Waste Operations Technician

Thursday, June 30, 1994

E2

NASA AMES RESEARCH CENTER NAVY HAZARDOUS WASTE STORAGE FACILITY DAILY INSPECTION LOG	1994 August																																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Emergency Eyewash/Shower OK (West side) (Y/N)	Y	Y	Y	Y	Y			Y		Y		Y			Y		Y		Y			Y		Y		Y			Y	Y	Y
Emergency Eyewash/Shower OK (East side) (Y/N)	Y	Y	Y		Y			Y		Y		Y			Y		Y		Y			Y		Y		Y			Y	Y	Y
All Locks Secure (Y/N)	Y	Y	Y		Y			Y		Y		Y			Y		Y		Y			Y		Y		Y			Y	Y	Y
General Condition of Hazardous Waste Containers OK (Y/N)	Y	Y	Y		Y			Y		Y		Y			Y		Y		Y			Y		Y		Y			Y	Y	Y
All Containers Secure and in Good Condition (Y/N)	Y	Y	Y		Y			Y		Y		Y			Y		Y		Y			Y		Y		Y			Y	Y	Y
Inspector's Initials/Time	AH 1000	AH 1000	AH 1000		AH 1000			AH 1005		AH 1000		AH 1000			AH 1000		AH 1005		AH 1005			AH 1000		AH 1000		AH 1000			AH 1000	AH 1000	AH 1000

Comments: (All sections with a "N" Indicated must be commented on in this section)

Eyewash Station East & West sides of Pad both have 1½" crack in them and Sprinkler Cap on Eyewash is plugged

Inspector: Al Hernandez

Title: Hazardous Waste Operations Technician

Thursday, June 30, 1994

NASA Ames Research Center/USA Field Services Group
Bldg 498 Hazardous Waste Storage Facility

E-3

Daily Inspection Log	1995 August																															
Inspector: Al Hernandez																																
Title: Field Technician	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Emergency Eyewash OK (Y/N)		Y		Y			Y		Y		Y			Y		Y		Y			Y		Y		Y			Y		Y	
Emergency Shower OK (Y/N)		Y		Y			Y		Y		Y			Y		Y		Y			Y		Y		Y			Y		Y	
All Locks Secure (Y/N)		Y		Y			Y		Y		Y			Y		Y		Y			Y		Y		Y			Y		Y	
General Condition of Drum Pad OK (Y/N)		Y		Y			Y		Y		Y			Y		Y		Y			Y		Y		Y			Y		Y	
All Containers Secure and in Good Condition (Y/N)		Y		Y			Y		Y		Y			Y		Y		Y			Y		Y		Y			Y		Y	
Inspector's Initials/Time		AH 9:40		AH 9:40			AH 9:05		AH 9:50		AH 10:10			AH 10:10		JS 10:05		AH 9:50			AH 10:30		AH 10:05		AH 9:15			AH 9:40		AH 9:18	

Comments: (All sections with a "N" indicated must be commented on in this section)

Replaced worn Inspection Tag on West ID Station

Thursday, March 23, 1995

Inspection Logs - March, 1996

Completed Copies are
at N-265

WEEKLY HAZARDOUS WASTE STORAGE AREA INSPECTION CHECKLIST

Area Inspected: _____

Inspection Date: _____ Inspection:_____ Time: _____

Name of the Inspector(s): _____

(Inspection items are based on hazardous waste (HW) inspection requirements of 22 CCR 66265.174 and will be conducted by qualified personnel only).

INSPECTION ITEMS	Y	N	Comments/Corrective Action
GENERAL			
1. Are all employees trained and is training documented and maintained?			
2. HW identified, characterized and classified, and managed properly?			
3. HW accumulated for <90 days?			
4. Incompatible HW segregated?			
5. HW management area kept clean and secure?			
CONTAINERS			
6. Containers handled safely to avoid ruptures and leaks?			
7. No leaking or damaged containers?			
8. Containers kept closed except when adding or removing HW?			
9. Containers properly completed and labels are legible?			
10. HW compatible with containers?			
11. Proper aisle space provided and maintained?			
SECONDARY CONTAINMENT			
12. Secondary containment provided for all liquid wastes?			
13. Secondary containment has adequate capacity to contain waste stored?			
14. Secondary container free of liquid and debris?			
SAFETY/WASTE MINIMIZATION			
15. Eyewash and emergency showers tested regularly and maintained?			
16. Contingency Plan and ER Procedures in place?			
17. PPE and spill kits available?			
18. Proper warning signs posted?			
19. Emergency response numbers well posted?			
20. Nonsaturated absorbents reused for spill clean up, if compatible?			
RECORDKEEPING			
21. Required HW management records complete and current?			
22. Inspection records maintained?			
23. Spill records maintained?			

I

Revised July 1995

SAFETY • HEALTH • ENVIRONMENTAL

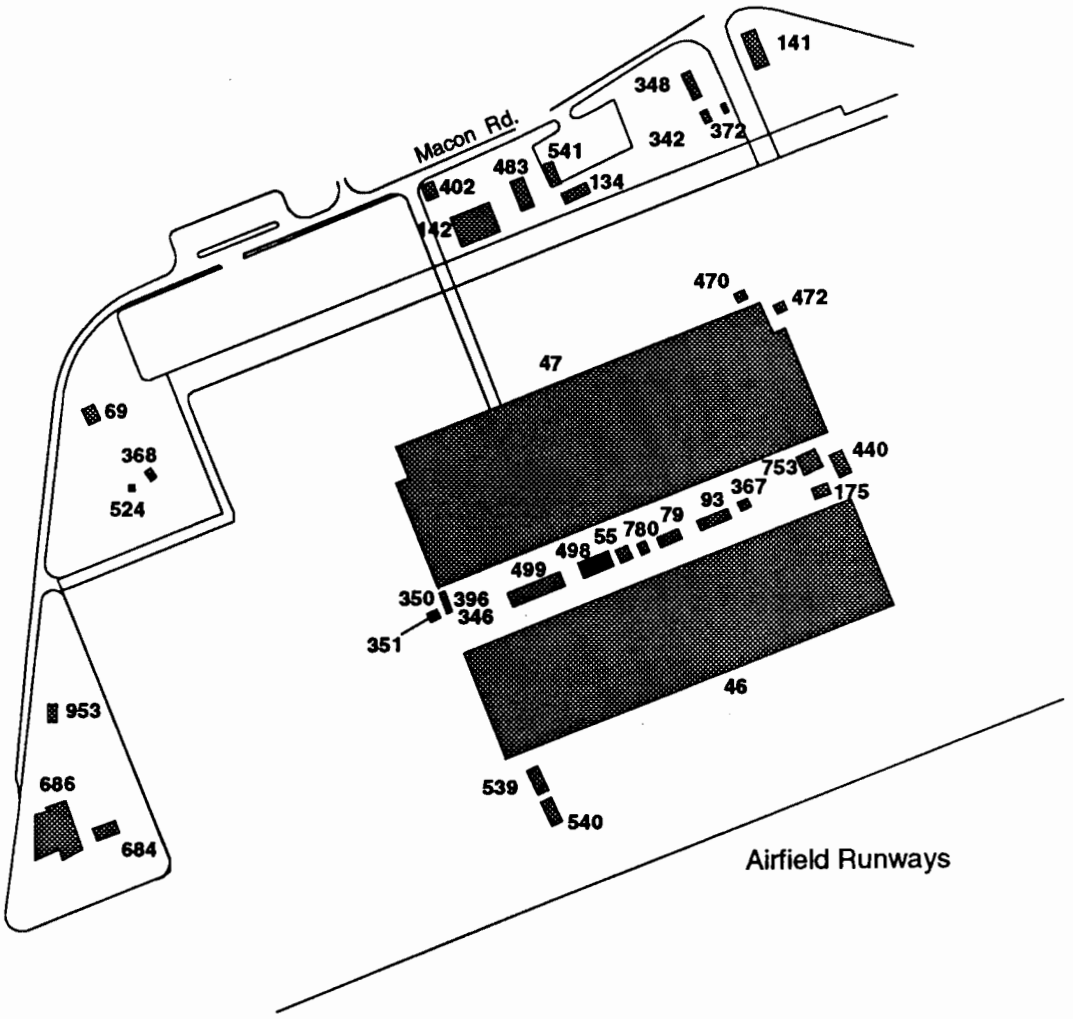
498

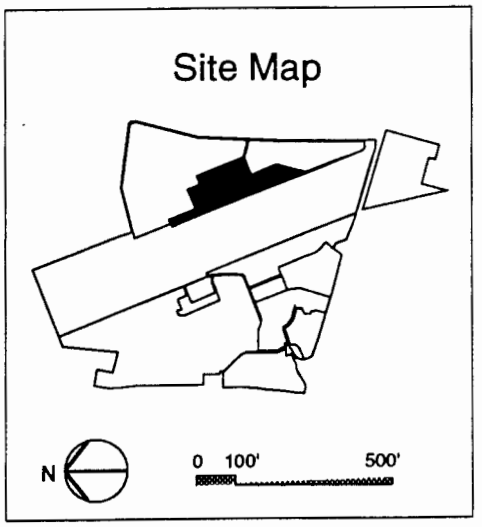
Building Emergency Action Plan

National Aeronautics and
Space Administration

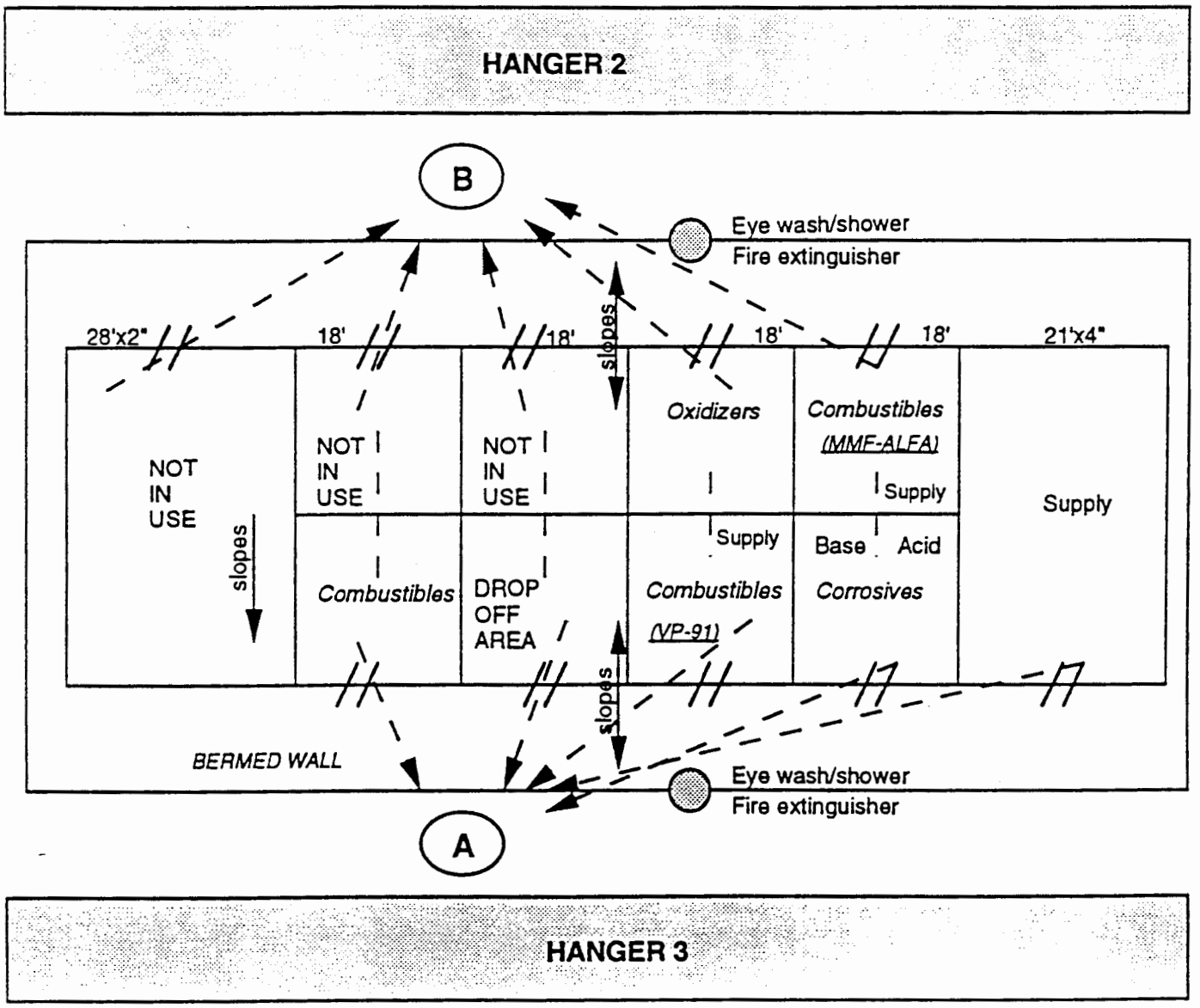
Ames Research Center
Moffett Field, California 940

Building 498





Building 498
Hazardous Waste Storage Area



Legend:

Supply: Includes absorbent, broom, miscellaneous containers, personal protective equipment.

(A) Primary assembly area

(B) Alternate assembly area

— → Evacuation routes

Hazardous materials cells have air horns for emergencies.

This facility is occupied Monday through Friday 10:00 am to 11:00 am.

S. Raj and S. Navarro 4/1/94

Date: March 1, 1995
Instructions: Complete a separate form for each building or area where hazardous materials are located.
Business Name: NASA Moffet Federal Air Field **Building /Area Name:** B498
Business Address: MS NAS 19-01, Moffett Field, CA 94035-1000 **Room Name/Number:** Inside B498

	PRODUCT DESCRIPTION		QUANTITY	STORAGE	HAZARDS
1. Storage Facility ID	**2. Waste category** **3. Physical State** **4. CAS #**	**5. Chemical Name** **a. Ingredient %** **b. Ingredient %**	**6. Max. Daily Amt.** **7. Average Daily Amt.** **8. Largest Container Cap.** **9. Days/year on site**	**10 a. Type** **b. Temp** **c. Press.**	**11. DOT Class** **12a. Physical** **12b. Health**
1. Inside B498	2. Fuels 3. L 4. NA for JP-5 77650-28-3 for diesel	5a. JP-5 b. Diesel	6. 110 gal 7. 55 gal. 8. 55 gal. 9. 365 day	10a. D 10b. 4 10c. 1	11. FL 12a. F 12b. I
1. Inside B498	2. Oils 3. L 4. NA	5a. petroleum oils	6. 110 gal 7. 55 gal. 8. 55 gal. 9. 365 day	10a. D 10b. 4 10c. 1	11. FL 12a. F 12b. I

Date: March 1, 1995

Instructions: Complete a separate form for each building or area where hazardous materials are located.

Business Name: NASA Moffet Federal Air Field **Building /Area Name:** B498

Business Address: MS NAS 19-01, Moffett Field, CA 94035-1000 **Room Name/Number:** Inside B498

1.Inside B498	2. Solvent Thinners	5a. mineral spirits	6. 110 gal	10a. D	11. FL
	3. L		7. 55 gal.	10b. 4	12a. F
	4. 64475-85-0		8. 55 gal.	10c. 1	12b. I
			9. 365 day		
1.Inside B498	2. Lubricant/grease	5a. petroleum oils	6. 110 gal	10a. D	11. FL
	3. L		7. 55 gal.	10b. 4	12a. F
	4. NA		8. 55 gal.	10c. 1	12b. I
			9. 365 day		
1. Inside B498	2. Oily Rags	5a. petroleum oils	6. 55 gal	10a. D	11. FS
	3. L		7. 25 gal.	10b. 4	12a. F
	4. NA		8. 55 gal.	10c. 1	12b. I
			9. 365 day		
1. Inside B498	2. Lithium batteries	5a. Lithium chloride	6. 10 pounds	10a. E	11. FS
	3. S	b. Thionyl chloride	7. 5 pounds	10b. 4	12a. F
	4. 7447-41-8 : lithium chloride		8. 15 pounds	10c. 1	12b. I
	7719-09-7: thionyl chloride		9. 365 day		

Date: March 1, 1995

Instructions: Complete a separate form for each building or area where hazardous materials are located.

Business Name: NASA Moffet Federal Air Field **Building /Area Name:** B498

Business Address: MS NAS 19-01, Moffett Field, CA 94035-1000 **Room Name/Number:** Inside B498

1. Inside B498	2. Battery Acid	5a. Sulfuric acid	6. 10 gal.	10a. E	11. Corrosive
	3. L		7. 5 gal.	10b. 4	12a. F
	4. 7664-93-9		8. 15 gal.	10c. 1	12b. I
			9. 365 day		
1. Inside B498	2. Chromic Acid	5a. Chromic acid	6. 10 gal	10a. E	11. Corrosive
	3. L		7. 5 gal.	10b. 4	12a. F
	4. 1308-14-1: in solution		8. 15 gal.	10c. 1	12b. I
			9. 365 day		
1. Inside B498	2. Ethylene glycol	5a. ethylene glycol	6. 55 gal	10a. D	11. misc./other
	3. L		7. 25 gal.	10b. 4	12a. F
	4. 107-21-1		8. 55 gal.	10c. 1	12b. I
			9. 365 day		
1. Inside B498	2. Paints	5a.	6. gal	10a. D	11. FL
	3. L		7. gal.	10b. 4	12a. F
	4. NA		8. 55 gal.	10c. 1	12b. I
			9. 365 day		

J

Training Plan

20. Hazardous Waste Operations

20.1 Purpose

To define the SAIC health and safety program for employees involved in hazardous waste operations, as required by 29 CFR 1910.120. Note that certain field operations that involve exposure to hazardous substances may not be covered under 29 CFR 1910.120 (as described in section 20.2-E) (e.g., visits to chemical manufacturing plants). For these operations this procedure does not apply. However, other procedures including, "Hazard Communication", and Hazardous Chemical Control, Procedure 8; "Respiratory Protection Program", Procedure 9; and "Medical Surveillance", Procedure 12 may apply depending upon the activity.

20.2 Definitions

A. Buddy System: A system of organizing employees into work groups so that each employee is designated to be observed by another employee in the work group.

B. Decontamination: The removal of hazardous substances from employees and their equipment to the extent necessary to preclude the occurrence of foreseeable adverse health effects.

C. Emergency response: A response effort by employees or other responders from outside the immediate area to any occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance.

D. Hazardous Waste: A solid, liquid, or gas that is no longer suited for its intended purpose and that is ignitable, corrosive, toxic, reactive, or listed by the Environmental Protection Agency (40 CFR 261).

E. Hazardous Waste Operation: Operations identified at 29 CFR 1910.120(a)(1), including; 1) clean-up operations required by a federal, state or local government body involving hazardous substances; 2) Initial investigations of government identified sites before the presence or absence of hazardous substances has been determined; 3) Clean-up operations at sites covered by the Resource Conservation and Recovery Act (RCRA); 4) Voluntary clean-up operations at sites recognized by federal, state, or local government bodies as uncontrolled hazardous waste sites, where an accumulation of hazardous substances poses a threat to health, safety or environment; 5) Operations involving hazardous wastes conducted at RCRA treatment, storage, and disposal facilities (TSDFs); and 6) Emergency response operations for releases or threatened releases of hazardous substances.

F. Hazardous Waste Site: Any location at which hazardous waste operations as defined above take place.

G. Site Health and Safety Officer (SHSO): The individual located on a site at which hazardous waste operations take place, who is responsible to the employer and has the authority and knowledge required to verify compliance with applicable safety and health requirements. The qualifications must be established based on the level and type of risk associated with the site (i.e. chemical contamination, radioactive material contamination, unexploded ordinance and/or other unique potential hazards).

20.3 Scope

A. This procedure applies to the following operations:

1. Clean-up operations required by a federal, state or local government body involving hazardous substances;

2. Initial investigations of government identified sites before the presence or absence of hazardous substances has been determined;

3. Clean-up operations at sites covered by the Resource Conservation and Recovery Act (RCRA);

4. Voluntary clean-up operations at sites recognized by federal, state, or local government bodies as uncontrolled hazardous waste sites, where an accumulation of hazardous substances poses a threat to health, safety or environment;

5. Operations involving hazardous wastes conducted at RCRA treatment, storage, and disposal facilities (TSDFs);

6. For hazardous waste operations conducted outside the United States, this procedure will apply, modified as necessary to ensure compliance with applicable environmental and safety requirements.

20.4 Organization for Health and Safety at Hazardous Waste Sites

The SAIC management organization described in Section A.3 of this manual is responsible for ensuring compliance with requirements of this procedure. Managers at all levels are responsible for planning project activities, providing resources, and enforcing project-specific health and safety plans so that project activities conform with this program. A Site Health and Safety Officer (SHSO) will be designated for each project that includes activities covered by this procedure.

20.5 Responsibilities

The responsibilities outlined in Section 20.5 are in addition to overall EC&HS responsibilities defined in Procedure 1, "Location-Specific EC&HS Policy and Responsibilities".

A. Corporate EC&HS Manager

1. Develops and updates EC&HS policy related to this procedure.

2. Audits field activities to ensure regulatory compliance, as well as compliance with internal SAIC EC&HS policies and procedures.

B. Group Manager

1. Implements SAIC risk management procedures, including approval of projects and subcontracts in business areas qualified by the Environmental Risk Subcommittee.

2. Ensures that managers in his/her Group are aware of and enforce applicable EC&HS requirements of this procedure, and that adequate resources are provided for effective implementation of this procedure.

C. Division Manager

1. Identifies contracts, projects, and/or tasks that are within the scope of this program and ensures that a SHSO is designated for each covered project.

2. Ensures that a health and safety plan (HASP) is prepared and approved for each project that requires one, before field work commences.

3. Provides the necessary resources required to ensure that EC&HS requirements and procedures are implemented, including obtaining or providing for all training, medical monitoring, respirator fit testing, protective clothing and equipment, and monitoring equipment for all employees identified to work at hazardous waste sites.

4. Identifies to the Local EC&HS Official the names of all individuals to be medically evaluated and receive required training to qualify for work at hazardous waste sites and provides the budget for medical and training costs.

D. Project Manager/Program Manager

1. Designates an individual to serve as site health and safety officer (SHSO) for each hazardous waste site/task covered by this procedure. The qualifications must be established based on the level and type of risk associated with the site (i.e. chemical contamination, radioactive material contamination, unexploded ordinance and/or other unique potential hazards).

2. Approves a HASP before the commencement of any field activities, after ensuring that it has been reviewed by an appropriately qualified individual, such as, a Certified Industrial Hygienist, Certified Safety Professional or other qualified individual[1]. When there are radiation hazards at a site, a review by a Certified Health Physicist is required.

3. Ensures adequate resources are provided to implement the HASP and enforces compliance with applicable EC&HS requirements and the HASP.

E. Local EC&HS Official

1. Obtains a copy of applicable federal, state and local regulations for environmental compliance and safety at a specific site.

2. Schedules medical examinations and training courses in advance of applicable expiration dates for employees who perform field work at hazardous waste sites.

3. Provides information as needed to Division and Project Managers regarding medical surveillance, training, personal protective equipment, safety plans, or other required actions related to field work.

4. Maintains a copy of medical qualification correspondence and records for the period of employment plus 30 years. Provides a copy of all required records to the SAIC EC&HS Manager as specified in Procedure 18 "Environmental Compliance & Health and Safety Records Management". Maintains a copy of employee training and exposure records, audits, and other project records in accordance with Procedure 18, "Environmental Compliance & Health and Safety Records Management".

5. Maintains a current copy of each site specific health and safety plan.

F. Site Health and Safety Officer (SHSO)

1. Participates in the preparation and implementation of the HASP.

2. Stops project activities and/or evacuates the site if unanticipated hazardous conditions are encountered for which the project is unprepared to respond or if any operation threatens employee or public health or safety.

3. Conducts routine inspections to verify compliance with the HASP and notifies Project Manager/Field Supervisor of EC&HS violations, deviations from the HASP, and hazardous conditions in accordance with Section 20.9 of this procedure.

In this context, a "qualified individual" is a person that has: a) at least four years experience in the development and implementation of occupational safety and health programs or implementation of health and safety plans. b) 40-hour initial and 8-hour supervisor training (29 CFR 1910.120) and c) a bachelor's degree in industrial hygiene, safety or other science related disciplines.

4. Conducts site-specific safety and health training and assures that employees have access to the HASP and MSDSs.

5. Maintains Project/Site safety and health records.

6. Conducts a post-field activity debriefing at the end of the project, to identify problems encountered and lessons learned, and prepares a record summarizing actions taken to ensure compliance with applicable requirements at each field site.

7. Coordinates emergency medical care.

8. Ensures that protective clothing and equipment are properly used and maintained.

9. Controls entry and access to the site.

10. Ensures that chemicals brought on site and wastes generated on site are properly handled, labeled and stored.

11. Ensures that personnel (employees and visitors) allowed access inside the exclusion zone or other controlled areas have completed the required training (i.e. 40 hour/8 hour refresher and site briefing) and received medical clearance.

G. Employees

Each employee is responsible for:

1. Completing his or her work assignment in a safe and effective manner;

2. Accepting an assignment or beginning a task only after understanding the risks and hazards associated with that activity;

3. Completing the training, monitoring medical status, respirator fit testing, wearing protective clothing, etc., as specified in the HASP, before beginning any job;

4. Maintaining and providing to the SHSO, a copy of medical correspondence and training certificate(s) needed to gain access to field sites. (Note: Employees not possessing certificates of training/medical clearance will be denied access to operations inside an exclusion zone or other controlled areas at a site);

5. Not working alone at a field location; using the buddy system;

6. Having a thorough knowledge of specific emergency response procedures for their specific work site(s);

7. Immediately reporting any occupational illness or injury to the appropriate supervisor/field project manager and/or personnel, including any potential exposure to hazardous substances for which protection was not provided;

8. Wearing and maintaining personal protective equipment as specified in the HASP;

9. Reporting to the SHSO any hazards not documented in the HASP or inadequately controlled by procedures contained in the HASP;

10. Implementing assigned responsibilities in accordance with the HASP (e.g., calibrating and using monitoring equipment).

20.6 Training

All SAIC employees, managers, supervisors, consultants and subcontractors who work at hazardous waste sites, as defined in subsection 20.2, require specialized training in health and safety. SAIC's responsibilities with respect to subcontractor employees are outlined in section 20.10 of this procedure.

A. Initial Training

1. SAIC employees, managers, supervisors, and consultants must complete 40 hours of initial training off-site prior to working at hazardous waste sites. The initial training may be reduced to 24 hours of off-site instruction for visitors, auditors, or other employees whose work at a hazardous waste site will be for a specific task of limited duration and whose work will not result in exposure over permissible exposure limits or published exposure limits. Figure 20-1, "Training Requirements Matrix", illustrates the relationships among these training requirements. The basis for a reduction in the level of initial training required must be documented by the SHSO and approved by the Local EC&HS Official.

Figure 20-1 Training Requirements Matrix

Task/Position (Examples)	Initial Training		OJT		Refresher (8-hr)	Supervisor (8-hr)
	40-hr	24-hr	3-day	1-day		
Project Manager for RI/FS or RA	X		X		X	X
Field Supervisor	X		X		X	X
Employee assigned work inside exclusion zone	X				X	
Employee performing work at TSD operations involving exposure to hazardous substances or health hazards		X		X	X	
Visitors, auditors, and other employees who will work at a hazardous waste site for a specific task of limited duration and are unlikely to be exposed above permissible exposure limits (i.e., is not required to wear respiratory protection)		X		X	X	

All new employees who conduct hazardous waste operations and who have completed the 40-hour training course must, at the time of first assignment, complete a minimum of three days actual field experience under the direct supervision of a trained and experienced supervisor, assigned by SAIC, before being available to conduct independent actions. Those who participate in the 24-hour course must have one day of on-the-job training under the direct supervision of a trained and experienced supervisor. A record attesting to the completion of this on-the-job training will be prepared by the supervisor and retained in accordance with Procedure 18,"EC&HS Records Management".

2. The 40-hour course for hazardous waste site workers must be designed to enable these workers to accomplish field tasks.

   The content of the initial 40 hour course for hazardous waste site workers must include the following topics:

   a. Overview of 29 CFR 1910.120 and appendices;

   b. Overview of 29 CFR 1910.1200;

   c. Rights and responsibilities of employees under OSHA and CERCLA;

d. Principles of toxicology, including effects of chemical exposures and methods for biological monitoring;

e. Contents of an effective Site Health and Safety Plan;

f. Personnel responsible for Site Safety and Health;

Note: Most 40-hour courses must be augmented to include information on personnel responsible for safety and health. This augmentation can be accomplished as part of the site safety briefing;

g. Selection and use of material handling equipment;

h. Shock sensitive materials;

i. Lab pack handling procedures;

j. Recognition, assessment, and control of chemical hazards, including toxicity, flammability, compressed gases and reactivity;

k. Recognition, assessment, and control of physical (safety) hazards, including housekeeping, heavy equipment, falls, and working surfaces;

l. Recognition, assessment, and control of radiological hazards;

m. Recognition, assessment, and control of noise hazards;

n. Donning and use of PPE, including basic types of suits and gloves, air purifying respirators, air supplied respirators, definition of EPA levels of protection;

o. Confined space hazards and controls;

p. Site monitoring equipment (air and environmental sampling, including calibration and maintenance) and interpretation of results;

q. Medical surveillance requirements;

r. Drum and container handling and spill containment;

s. Container sampling procedures;

t. Classification and shipment of hazardous materials;

u. Equipment and personnel decontamination;

v. Recognition and response to site emergencies, including evacuation signals and medical emergencies;

w. Illumination requirements;

x. Sanitation requirements;

y. Hands-on field exercises and demonstrations.

The course certificates should state that satisfactory course completion satisfies the training requirements of the Hazardous Waste and Emergency Response standard - 29 CFR 1910.120, the Hearing Conservation standard - 29 CFR 1910.95, the Respiratory Protection standard - 29 CFR 1910.134, and the general components of the Hazard Communication standard - 29 CFR 1910.1200.

B. Alternatives to 40-hour initial training

1. Those visitors, auditors, and other employees engaged in work at a hazardous waste site for a specific task of limited duration and whose work will not result in exposure above permissible exposure limits or published exposure limits are required to complete 24 hours of off-site instruction prior to their first day of work on the site.

2. A 24-hour initial safety and health training course must include the following topics:

a. Overview of 29 CFR 1910.120 and appendices;

b. Overview of 29 CFR 1910.1200;

c. Rights and responsibilities of employees under OSHA and CERCLA;

d. Recognition, assessment, and control of chemical hazards. Must include toxicity, flammability, compressed gases and reactivity;

e. Recognition, assessment, and control of physical (safety) hazards, including housekeeping, heavy equipment, falls, and working surfaces;

f. Recognition, assessment, and control of radiological hazards;

g. Recognition, assessment, and control of noise hazards;

h. Donning and use of PPE, including basic types of suits and gloves, air purifying respirators, air supplied respirators, definition of EPA levels of protection;

i. Site monitoring equipment (air and environmental sampling, including calibration and maintenance) and interpretation of results;

j. Medical surveillance requirements;

k. Equipment and personnel decontamination;

l. Recognition and response to site emergencies, including evacuation signals, medical emergencies.

3. An employee's previous work experience and/or training can be accepted in lieu of training if it can be shown that it was equivalent. The Corporate EC&HS Manager will review the employee's work history and academic training, as documented by the employee, to determine its suitability. The employee must document at least 40 hours of appropriate classroom instruction or at least 80 hours of on-site experience at a RCRA and/or CERCLA facility, at an appropriate level, under an approved Health and Safety Plan. All documentation, including a memo describing an individuals work experience and/or training and a copy of the certificate, will be maintained in accordance with Procedure 18, "EC&HS Records Management Procedure".

C. Manager/Supervisor Training (8 Hours)

1. All managers and supervisors directly responsible for hazardous waste site operations will complete one eight-hour management/supervisor training course in addition to the 40-hour or 24-hour, and annual 8-hour refresher courses. This training must be completed prior to supervising on-site work. This training will include such topics as:

a. Management responsibilities;

b. SAIC EC&HS Program;

c. Development, implementation and review of HASPs;

d. Implementation and auditing of health and safety requirements, including: personal protective equipment, spill containment, and health hazard monitoring;

e. Decision-making and documentation;

f. Emergency procedures, incident investigation and notification requirements;

g. Budgeting and purchasing health and safety equipment;

h. SAIC resources;

i. Subcontractor control and liability.

D. Project or Site-Specific Training

1. All field staff, managers, and supervisors assigned to a hazardous waste operation must participate in site-specific training. This training must be completed prior to commencing activities at a specific site and after all other required health and safety training is completed and medical clearance for site work received. The length of site specific training is dependent on the scope and complexity of site operations and expected hazards. This training can take place in the office or at the site. Topics to be covered must be specified in the HASP. Recommended topics include:

   a. Names and telephone numbers of personnel and alternates responsible for site health and safety and emergency response;

   b. Site history and review of specific health and safety hazards for various tasks and operations;

   c. Employee health and safety responsibilities;

   d. Review of site zones and decontamination procedures;

   e. Medical surveillance requirements for hazards on-site;

   f. Medical symptoms that may indicate over-exposure to site hazards;

   g. Frequency and types of monitoring to be performed for health and safety hazards;

   h. Equipment calibration procedures to be followed for site monitoring equipment;

   i. Site control measures;

   j. Emergency procedures, response equipment and telephone numbers;

   k. Confined space entry procedures (if required);

   l. Levels of protection and PPE use, storage, and maintenance requirements;

   m. Spill containment and hazardous waste management procedures, to be implemented on-site;

   n. Site tour;

   o. Location of HASP and MSDS;

   p. Chain of command;

2. Additional safety briefings will be held as necessary to ensure site personnel are aware of the requirements of the HASP, operational limitations, changes in conditions at the site, changes in the HASP and possible approaches to anticipated technical problems. Briefings may be of short duration (10 to 15 minutes) but will be sufficiently comprehensive to ensure awareness of site-specific requirements. All safety briefings will be documented, including date and time, name and signature of person providing briefing, content of briefing and signatures of attendees.

E. First Aid and Cardiopulmonary Resuscitation Certification

1. Each HASP must specify whether participants at field operations will be required to have first aid and Cardiopulmonary Resuscitation (CPR) Certification. When required, it is recommended that this instruction be provided by American Red Cross registered instructors. First aid and CPR training must be repeated at intervals specified by the American Red Cross. When first aid and CPR training is not required, the HASP shall state why this course of action is reasonable (e.g., arrangements can be made with a nearby clinic that can respond in less than five minutes).

2. First aid and CPR is considered to be a collateral duty, not a primary assignment. In the event an injury occurs and an individual rendering first aid is exposed to blood or other potentially infectious materials, the person(s) exposed must be provided with follow-up medical surveillance in accordance with 29 CFR 1910.1030.(f)(1).

F. Annual Training (8-Hour)

1. Every employee working at a hazardous waste site will complete an annual refresher course on health and safety. This course must be completed within 12 months of previous training and be of at least eight hours duration. The topics to be included are:

a. Review of SAIC's EC&HS Program;

b. Chemical and physical hazards and hazard communication;

c. Use and maintenance of personal protective equipment;

d. Respiratory protection;

e. Medical surveillance program;

f. Engineering and administrative hazard control;

g. Decontamination procedures;

h. Level A, B, C, and D protection review;

i. Exposure monitoring;

j. Confined space entry;

k. Handling emergencies and self rescue;

l. Hearing conservation;

m. Hazardous waste management/hazardous materials shipment.

2. If an employee that received 40-hour or 24-hour initial training is temporarily removed from hazardous waste operations and more than 13 months has elapsed between 8-hour refresher training, an evaluation will be made by the Corporate EC&HS Manager to determine whether the individual is required to receive the initial 40-hour or 24-hour training again or may be re-certified after an 8-hour course. In all cases a lapse period of three years or more will require that the employee complete an initial 40-hour course. The Corporate EC&HS Manager must document how the employee maintained a current, working knowledge of the topics in 29 CFR 1910.120 (e)(2) and (4) during the lapse period.

G. Selection of Trainers

Training required by this section must be provided by qualified trainers, if it is to be accepted by students as accurate and authoritative. The SAIC EC&HS Manager will, upon request, identify SAIC employees who are qualified to provide this instruction. When outside vendors are selected to conduct required training courses, the basis for the selection must be documented by the individual responsible for vendor selection, and include: the course duration, topics covered, instructor qualifications, previous experience giving the course, and recommendations (if any) of SAIC employees who have taken the course. A memorandum, to the file, summarizing the vendor's qualifications will be maintained in accordance with Procedure 18, "EC&HS Records Management Procedure".

H. Training Records

1. Certificates documenting completion of required 40-hour, 24-hour and 8-hour courses must be signed by the course instructor and contain the following information:

a. Name and type of course;

b. Training requirements satisfied (*e.g.*, 29 CFR 1910.120, 29 CFR 1910.95, etc);

c. Name and Employee number of attendee;

d. Completion date; and

e. Instructor's name and signature.

2. Records of project or site-specific training must include the date of training, attendees, topics covered, and the instructor's name and signature.

3. Training records will be maintained in accordance with Procedure 18, "EC&HS Records Management Procedure".

20.7 Medical Requirements

A. Medical Surveillance

1. The medical surveillance program for employees who work at hazardous waste operations is defined in Procedure 12, "Medical Surveillance". Examination frequency, minimum examination content, payment for examination, selection of physicians, information to provide to the physician, information to be provided to employers, and maintenance of and access to medical records are addressed in Procedure 12, "Medical Surveillance".

2. Additional medical surveillance requirements, beyond those specified in Procedure 12, "Medical Surveillance", may be required based on health risks at a specific site. Such requirements must be specified in the HASP.

B. Emergency Medical Care

1. In the event that personnel exhibit signs or symptoms of chemical exposure/physical stress while on-site, the emergency medical treatment provisions of the site emergency response program (as contained in the HASP) must be implemented. This includes emergency first aid, transportation to a nearby medical facility, and a medical examination to detect any potential job-related symptoms or illnesses. All such events must be reported immediately to the Local EC&HS Official and the applicable SAIC Personnel Office.

20.8 Health and Safety Plan (HASP)

A. Purpose

A HASP, an integral part of SAIC's EC&HS Program, characterizes site hazards and controls. The purpose of the HASP is to establish procedures to protect employees and the public from the potential hazards present at a project site. This procedure establishes the content and format for SAIC HASPs. The content and format are based on provisions contained in 29 CFR 1910.120(b)(4). Deviations from the established content set forth by this procedure must be reviewed and approved by the Local EC&HS Official.

B. Requirements

1. A HASP is to be written for each project involving hazardous waste operations performed by SAIC. Each HASP must be completed and approved before the commencement of any work activities at the site. Prior to developing a HASP for any given project, project personnel assigned the responsibility of writing the HASP will review the content and format of the HASP as presented in Exhibit 20-5 of this procedure.

Enclosure D

- The following pages contain training information for on-site Laidlaw Environmental Services (LES) personnel.

- Pages D-1 through D-5 are copies of Laidlaw's training database. Page D-2 shows a matrix of training received by all on-site LES personnel.

- Page D-7 is a copy of Mr. Dan Winningham's job description.

- Pages D-8 through D-15 are copies of Mr. Winningham's recent training courses.

GS MASTER TRAINING MATRIX

TABLE - DATA ENTRY

EMPLOYEE NAME
JOB TITLE
ASB - Asbestos Disposal Operations Training (if applicable, found in employee box)
EMR - Emergency Response Training (if applicable, found in employee box)
RESP-BRAND SZ - Date of fit test will precede respirator type and size
STRT DT - PHYSICAL DT - Employee start date & date of last physical

COLUMN NUMBER KEY

(six digit numeral is the month, day and year, training took place)
[**A** - Lesson Agenda Needed, **C** - Training Certificate Needed, **R** - Training Sign-in Roster Needed]

1. Contract Site & 3 Day On-Site Training (**X**)
2. 24 Hour Training.
3. 40 Hour Training.
4. Forklift Training & Heavy Equipment Training.
5. 8 Hour Training (most recent).
6. 8 Hour Training (supervisor).
7. CPR (annual - most recent).
8. 1st Aid (triennial - most recent).
9. LES Defensive Driving.
10. Initial & Annual EPA/40 CFR (TSF).
11. Initial & Biennial DOT/49 CFR.
12. Confined Space (competent person).
13. Confined Space (supervisory).
14. Loss Control Management.
15. Substance Abuse Training (employee).
16. Substance Abuse Training (supv.).

GS MASTER TRAINING MATRIX

D-2

EMPLOYEE NAME JOB TITLE ASBESTOS - EMERG RESP TR RESP-BRAND SZ START DT - PHYSICAL DT	1. CT	2. 24 HR	3. 40 HR	4. FRKLFT HVY EQ	5. 8 HR	6. SUPV	7. CPR	8. 1STA	9. DRV	10. EPA-I EPA-R	11. DOT-I DOT-R CDL	12. CS-C REFR	13. CS-S REFR	14. LSSC	15. SAB-E	16. SAB-S
HERNANDEZ, ALFONSO FIELD TECHNICIAN EMR 9/93 10/95-MSA ULT TWIN (M) STRT 12/94 - A/PH 12/95	91 8 X	NA	071493	041895	052395		012696	083093		-	020693 072695				010896	-
SINGH, IQBAL FIELD CHEMIST EMR 3/95 5/95-MSA ULTR TWIN (L) STRT 7/94 - A/PH 7/95	91 8 X	NA	072294	041895	051695	121294	012696			-	030895 072795	090294 120895			010896	-
TRAN, DUC FIELD CHEMIST EMR 10/95 12/95-MSA ULTR TWIN (L) STRT 10/95 - A/PH 10/95	91 8 X	NA	101390		121495		012696	041794		-	041594				010896	-
WINNINGHAM, DAN PROJECT SUPERVISOR EMR-3/95 6/95-MSA ULT TWIN (M) STRT 12/94 - A/PH 12/95	91 8 X	NA	123193	051195	052395	022790	010096	021290	021291	-	030293 031395	071990 120895			NA	081795

LAIDLAW ENVIRONMENTAL SERVICES

Government Services

TO: CONTRACT AND PROJECT SUPERVISORS /Nasa

FROM: RICK VANDERGEEST

RE: GS MASTER TRAINING MATRIX

DATE: FEBRUARY 13, 1996

Please call me when you receive this correspondence, so that I may discuss it with you!

Attached is the GS Master Training Matrix (updated as of 2/96) which includes site personnel and mandatory and non-mandatory Laidlaw classes. **It is the responsibility of contract management to assure that personnel remain current in mandatory training requirements.** If personnel at your contract site are highlighted, it indicates corrective action is needed. The highlighted item may involve forwarding training correspondence to me or enrolling personnel in a particular training class. Certain training may not be due until May, '96.

Prior to enrollment into a selected class, please contact me. I may know of other class dates or locations which may avoid unnecessary expenses and lost time.

NOTE: If personnel possess a current CPR certificate and are coming due for the annual update, you can request through the American Red Cross to take the **CPR Challenge.** The CPR Challenge may be accomplished to bypass the four hour class; it will update you for another year. When taking the CPR Challenge, you have to take the written CPR test and show proficiency in performing CPR.

To help you through the training roster, I have explained each block below and possible action to be taken.

* Employee Name (Box): Each employee should have a respirator brand/make and size entered. If the information is missing or incorrect, please forward a current completed fit test form. Fit tests are required annually; the month and year last performed will precede the respirator information.

* Block #1: Contract site billing number.

  (bottom half of block): A missing **X** indicates documentation for 3 day on-site training was not received. **IMMEDIATE ACTION REQUIRED!!**

Laidlaw Environmental Services (GS), Inc.
902 South Main Street Post Office Box 140 Saukville, Wisconsin 53080
Phone 414.284.3427 Fax 414.284.0018

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* Block #2 & #3: 24 hour training and 40 hour training, respectively. A date will be entered if training was accomplished or "NA" will be entered if 40 hour training was completed instead of the 24 hour training. Employees will have 24 hour and 40 hour or just 40 hour training. A 16 hour conversion may be necessary to upgrade from 24 to 40 hour.

* Block #4: Forklift training. All employees (excluding secretaries) should have forklift training.

* Block #5: 8 hour annual training. The most recent training will be listed. 8 hour training is an annual requirement following the initial 40 hour training.

* Block #6: 8 hour supervisor training. This training is required of personnel that supervise remediation projects. (i.e. tank cleaning).

* Block #7: CPR training. The most recent training date will be listed. CPR is an annual requirement and arrangements to keep current should be made through local agencies.

* Block #8: 1st Aid. The most recent training date will be listed. 1st Aid is a triennial requirement and arrangements to keep current should be made through local agencies.

* Block #9: LES Defensive Driving. This is recommended of all Laidlaw personnel that drive LES vehicles or even drive rental cars for LES operations. It is a mandatory requirement for CDL drivers.

* Block #10: Initial EPA/40 CFR training. This is a requirement of LES personnel that are assigned to a RECRA TSF.

  (bottom half of block): Annual EPA/40 CFR training. LES personnel that are assigned to a RECRA TSF are required to have annual updates.

* Block #11: Initial hazardous materials training. The initial DOT training date will be listed. This training is a requirement of DOT/49 CFR.

  (middle & bottom half of block): Required biennial DOT training will be noted and "CDL" will be printed if the person currently has a Certified Drivers License

* Block #12: Confined space (competent person) training. The most recent training date will be listed. This training or the qualified person training is required of all employees accomplishing confined space duties.

  (bottom half of block): 12 month hands-on refresher. This is a requirement if sites are accomplishing confined space work.

* Block #13: Confined space (supervisory) training. The most recent training date will be listed. This training is required of personnel supervising confined space operations.

  (bottom half of block): 12 month hands-on refresher. This is a requirement if sites are accomplishing confined space work.

* Block #14: Loss control management. The most recent training date will be listed. This training is intended for supervisory personnel. This training is a recommended for Laidlaw supervisors.

* Block #15: Substance abuse training (employee). The most recent training date will be listed. This training is a requirement for all Laidlaw employees.

* Block #16: Substance Abuse Training (supervisor). The most recent training date will be listed. This training is a requirement of Laidlaw supervisors.

Please review the training roster as soon as possible and make any changes that are needed. If changes are made, forward the corrected GS Master Training Matrix with correspondence justifying the change (i.e. certificates, lesson plans, sign-in rosters)

If training is accomplished in any other location than Lexington, SC, forward a copy of the training roster and agenda to me.

If you have any questions, please contact me.

cc. Regional Operation Managers

ltr\trngmstr

TRAINING FILE ORDER

(insert as 1st page in training folder)

1. JOB DESCRIPTION
2. 40 HOUR TRAINING
3. RESPIRATORY FIT TEST FORM (most recent first/staple)
4. 3 DAY ON-SITE TRAINING
5. 8 HOUR UPDATE TRAINING (most recent first/staple)
6. 40 CFR (EPA) TRAINING (most recent first/staple - only apply to TSF)
7. 49 CFR (DOT) & FIELD CHEMIST TRAINING (most recent first/staple)
8. EMERGENCY RESPONSE TRAINING
9. 8 HOUR SUPERVISOR TRAINING
10. CPR & FIRST AID TRAINING (most recent first/staple)
11. CONFINED SPACE TRAINING
12. CONFINED SPACE UPDATE (most recent first/staple)
13. FORKLIFT TRAINING
14. OTHER TRAINING

Course documentation should include Certificate (1st pg.), Sign-in Roster (2nd pg.), Agenda (3rd pg.)

frm\trngfldr

LAIDLAW ENVIRONMENTAL SERVICES
NASA-AMES RESEARCH CENTER

JOB RESPONSIBILITIES

NAME: **Dan Winningham**

TITLE: **Sr. Project Supervisor**

Supervise a three person technical staff
Management of most on-site hazardous waste disposal operations (N265, 498)
Operation of the hazardous waste computer tracking system
Maintain all waste profile paperwork and manifest files for NASA
Emergency Response Coordinator
Interaction with generators regarding waste management practices
Preparation of all reports to SAIC/NASA

D-8

Certificate of Completion

this is to certify that

DAN WINNINGHAM

has sucessfully completed the

Chemical Waste Management, Inc.

Course in

40 HOUR HAZARDOUS WASTE OPERATIONS: 29 CFR 1910.120/1910.1200

as Implemented under CWMI Policies & Procedures for Household Waste Activities

on this 31ST day of DECEMBER 1993

Trainer

AREA H & S MANAGER

Title

CAPDEAL ENVIRONMENTAL SERVICES INC.

Health & Safety Group

RESPIRATOR PROTECTION TRAINING RECORD

NAME: Dan Winningham SSN#: 546-04-5308

DATE: 6/22/95 FACILITY: C-720

Satisfactory completion of a fit test is indicated below by entering the manufacturer's model #, appropriate facepiece size (S: small, M: medium, L: large), and the facepiece/hood/type on the line indicated.

MANUFACTURER	MODEL #	SIZE	FACEPIECE/HOOD/TYPE
MSA	ULTRAVIEW	MEDIUM	FULL FACE
NORTH			
WILLSON			
OTHER:			

Respiratory Protection Training, including fit testing for the respirator(s) listed above, included the following details:

1. *Purpose of respiratory protection.*
2. *When Respirators should be used.*
3. *Limitations of respiratory protection.*
4. *Selection and use of respiratory protection.*
5. *Maintenance and sanitation of respiratory protection.*
6. *Instruction on proper fit and field testing for proper seal.*
7. *Fit-testing using irritant smoke test and iso-amyl acetate test.*
8. *Medical surveillance associated with use of respirators.*
9. *Conditions, such as facial hair, which prevent a good seal.*
10. *Actions to be taken when breakthrough or loss of seal occurs.*

I understand the proper use and restrictions for the respirator(s) I have been fit-tested and trained to wear.

Signatures: [signature]

EMPLOYEE: _____ *TRAINER:* [signature]

4501 Pacheco Boulevard Martinez, California 94553 Phone 415.372.4800 Fax 415.370.0312

LAIDLAW ENVIRONMENTAL SERVICES

Government Services

3 DAY ON-SITE TRAINING
(NEW EMPLOYEES AND TRANSFER EMPLOYEES)
[Training IAW 29 CFR 1910.120 (e)]

EMPLOYEE NAME Dan Winningham JOB TITLE Sr. Project Supervisor

DATE ASSIGNED 12/19/94 DATE TRAINING INITIATED 12/19/94

OPERATIONAL TRAINING (review & understand) CONTRACT OFFICE SITE _____	INSTR IN	EMPL IN	TRNG DATE	DATE OF PREVIOUS SITE TRNG
Written office evacuation plan & posted evacuation plan/equipment map		DAW	12/19/94	
Health & Safety Plan (review/acknowledge)		DAW	12/20/94	
Contingency Plan		DAW	12/20/94	
Site Specific Standard Operating Procedures		DAW	12/21/94	
Hazard Communication (binder)		DAW	12/20/94	
Job Safety Briefings performed as necessary		DAW	12/19/94	
Location of gear bags, PPE, safety equipment		DAW	12/19/94	
Respirator use & maintenance		DAW	12/19/94	
Use of tools, equipment, and machinery		DAW	12/19/94	
Drum handling techniques		DAW	12/19/94	
Aisle space & stacking requirements		DAW	12/19/94	
Vehicle loading/unloading		DAW	12/19/94	
Equipment failure procedures		DAW	12/20/94	
Waste compatibilities and storage location		DAW	12/19/94	
Decontamination procedures		DAW	12/19/94	
Location of spill response supplies		DAW	12/19/94	
Housekeeping (field & office)		DAW	12/21/94	
Operating system paperwork and labeling		DAW	12/20/94	
Inspection procedures		DAW	12/19/94	
Medical surveillance requirements		DAW	12/21/94	

DATE TRAINING COMPLETED 12/21/94

EMPLOYEE (EMPL) Dan Winningham (SIGNATURE) 12/21/94 DAW (INITIAL (IN))

INSTRUCTOR (INSTR) _____ (SIGNATURE) _____ (IN) INSTR _____ (SIGNATURE) _____ (IN)

INSTRUCTOR (INSTR) _____ (SIGNATURE) _____ (IN) INSTR _____ (SIGNATURE) _____ (IN)

FILE: ORIGINAL (TRAINING FOLDER) COPY (FORWARD TO SAUKVILLE)

LAIDLAW ENVIRONMENTAL SERVICES

HEALTH AND SAFETY DEPARTMENT

CERTIFICATE OF TRAINING

This is to certify

DAN WINNINGHAM

has satisfactorily completed a course in

HEALTH and SAFETY REQUIREMENTS
for HAZARDOUS WASTE OPERATIONS
REFRESHER TRAINING: 1995

satisfying the Health & Safety "8 hour* annual
refresher training requirements of 29 CFR 1910.120

05/23/95
Date

LAIDLAW ENVIRONMENTAL SERVICES, INC.

Rene A. Ricks

Rene A. Ricks
Regional Health & Safety Manager

Annual HazWOPER Refresher Training

[pursuant to 29 CFR §1910.120 and 8 CCR §5192]

AGENDA

Subject	Time	Minutes
I. Introduction & Pre-test	8:30 a.m. - 9:30 a.m.	60
II. Regulatory Update • PPE • Fall Protection	9:30 a.m. - 10:15 a.m.	45
BREAK	10:15 a.m. - 10:30 a.m.	15
III. Hazard Awareness • Slips, Trips, Falls • Electrical Safety • Hazard Assessment Exercise	10:30 a.m. - 12:00 noon	90
LUNCH	12:00 noon - 12:30 p.m.	30
IV. Facility H&S Program (George DeLaye)	12:30 p.m. - 1:00 p.m.	30
V. Safety Permit Systems	1:00 p.m. - 1:45 p.m.	45
VI. Confined Space Entry Basics (includes video)	1:45 p.m. - 2:45 p.m.	60
BREAK	2:45 p.m. - 3:00 p.m.	15
VII. MSDS Review	3:00 p.m. - 3:30 p.m.	30
VIII. HazWOPER Scavenger Hunt	3:30 p.m. - 5:00 p.m.	90

LAIDLAW ENVIRONMENTAL SERVICES

HEALTH AND SAFETY DEPARTMENT

CERTIFICATE OF TRAINING

This is to certify

DAN WINNINGHAM

has satisfactorily completed a course in

16 Hour Emergency Response-Specialist Level

in accordance with 29 CFR 1910.120, q, iii.

03/13/95
Date

LAIDLAW ENVIRONMENTAL SERVICES INC.

Rene A. Ricks

Rene A. Ricks
Regional Health & Safety Manager

Emergency Response Training

[pursuant to CCR Title 8, Section 5192]

AGENDA

Thursday, July 13, 1995		
	Subject	**Time**
I.	Introduction & Course Review Environmental Laws and Regulations	8:00 - 9:00 a.m.
II.	Incident Command System (video)	9:00 - 10:15 a.m.
	BREAK	10:15 - 10:30 a.m.
III.	LES Emergency Response Plan	10:30 - 11:15 a.m.
IV.	Hazard Recognition & Site Characterization	11:15 - 12:00 p.m.
	LUNCH	12:00 - 12:30 p.m.
V.	Personal Protection	12:30 - 1:30 p.m.
VI.	Spill Control & Containment Methods	1:30 - 2:45 p.m.
	BREAK	2:45 - 3:00 p.m.
VII.	Sampling Methods & Monitoring Equipment	3:00 - 4:00 p.m.
VIII.	Decontamination	4:00 - 5:00 p.m.
Friday, July 14, 1995		
IX.	Examination and Review	8:00 - 9:00 a.m.
X.	PPE Overview • Donning and Doffing, Level A • Donning and Doffing, Level B	9:00 - 11:00 a.m.
	BREAK	11:00 - 11:15 a.m.
XI.	Cascade System/Line Air	11:15 - 12:00 noon
	LUNCH	12:00 - 12:30 p.m.
XII.	Supply Readiness (stock areas, vehicles, etc.)	12:30 - 12:45 a.m.
XIII.	Emergency Response Practicum	12:45 - 4:30 p.m.
XIV.	Course Evaluation & Question and Answers	4:30 - 5:00 p.m.

ERAGENDA051895

Cardiopulmonary Resuscitation and Emergency Cardiac Care Provider

American Heart Association
Fighting Heart Disease and Stroke

Dan Winningham
has participated in an American Heart Association HeartSaver Course.

1/96
Issue Date

1/98
Recommended Renewal Date

Name of American Heart Association	CPR SEMINARS 632-6135 ALAMEDA COUNTY AHA
Instructor's Name	Mike Spade
Instructor's I.D. No.	
Holder's Signature	

This recognition is subject to the provisions and limitations of applicable state statutes and licensing acts.

©1994, American Heart Association 70-0152

D-15

Diploma

OF SAFETY TRAINING

This is to certify that:

DAN WINNINGHAM

has successfully completed the
SAFETECH
CONFINED SPACE ENTRY training program.

Jay James
INSTRUCTOR

1308
CERTIFICATE NUMBER

JULY 19, 1990

Certificate of Training

This certifies that

Dan Winningham

has completed four hours

of

Forklift Operator Safety Training

in accordance with 29 CFR 1910.178
and Cal/OSHA Title 8 3664 Industrial Truck Operator

May 11, 1995

BOEING NASA-AMES
Moffett Field, California

Presented by:
Environmental & Safety Resources

Liz Aragón

LIZ ARAGON, DIRECTOR

LAIDLAW ENVIRONMENTAL SERVICES

This Is To Certify That

DAN WINNINGHAM

Has Completed 4 *Hours of Training*

On

The Supervisor's Role in Administering D.O.T. Regulations and a Drug-Free Workplace

Training Components Completed:

- *The effects and consequences of controlled substance abuse on personal health, safety and the work environment.*
- *The manifestations and behavioral causes that may indicate substance use or abuse.*
- *The Company's Substance Abuse Program: Policy and Employee Assistance Program.*

Sponsored by Laidlaw Environmental Services *Trainer* Rene A. Ricks

Date *Trainee*

ATTACHMENT ~~M~~ K

RCRA CEI conducted April 11, 1996

Hazardous Waste Reduction Plan (S. B. 14)

SB 14

PLAN, REPORT AND SUMMARIES

Reporting Year 1994

Prepared by:

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
Moffett Field, California 94035-1000

FOR

NASA Ames Research Center
Occupational Safety, Health and Environmental Services Office
MS 218-1, Moffett Field, California 94035-1000

September 1, 1995

An Employee Owned Company

NASA AMES RESEARCH CENTER

SB 14 CERTIFICATION

Prepared For:

STATE OF CALIFORNIA
ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF TOXIC SUBSTANCES CONTROL
ALTERNATIVE TECHNOLOGY DIVISION
SOURCE REDUCTION UNIT
P.O. BOX 806
SACRAMENTO, CA 95812-0806

As Required By:

22 CCR 67100.13

CERTIFICATION

"I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or the 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 making false statements or representations to the Department, including the possibility of fines for criminal violations."

Peter O. Yimbo (REA# 00978)	PETER YIMBO
REA Signature	Print Name
Environmental Program Manager	2-23-96
Title	Date
Diane Sl	Diane Shelander
NASA Signature	Print Name
Environmental Program Manager (Acting)	3-5-96
Title	Date

SOURCE REDUCTION EVALUATION REVIEW AND PLAN

FOR NASA AMES RESEARCH CENTER

SEPTEMBER 1, 1995

Prepared to fulfill the requirements of Title 22 CCR Section 67100.4
promulgated under the Hazardous Waste Source Reduction and
Management Review Act of 1989
Senate Bill 14

Prepared by:

SAIC
NASA Ames Research Center
M/S 19-21
Moffett Field, CA 94035-1000

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This plan has been prepared pursuant to Section 67100.5 of CCR Title 22 to fulfill the requirements of performing a source reduction and evaluation review as required under Section 67100.4 of CCR Title 22.

1.0 NAME AND LOCATION OF SITE

NASA-Ames Research Center (ARC)
Moffett Field, California 94035-1000

2.0 SIC CODE

All operations and activities as NASA-ARC are included in SIC code 9661 - Space Research and Technology

3.0 TYPE OF BUSINESS CONDUCTED AT NASA-ARC

The primary activity of NASA-ARC is to support space and aeronautics research and development.

4.0 LENGTH OF TIME IN BUSINESS AT PRESENT LOCATION

NASA-ARC has been operating at its present location since its establishment by Congress in 1939.

5.0 MAJOR SERVICES AND PRODUCTS PROVIDED BY NASA-ARC

The major R&D projects at NASA-ARC include:

Aeronautic and Flight Systems
- Fundamental Aerodynamics
- Rotorcraft Technology
- Computational Fluid Dynamics
- Flight Simulation
- Military Support

Astronautics
- Airborne Science and Application
- Planetary Probes
- Astronomical Observation Techniques

Life Sciences
- Biomedical Support Systems
- Biological Experiments
- Extraterrestrial Research

Earth System Sciences
- Ecosystem Science and Technology
- Atmospheric Chemistry and Dynamics
- Atmospheric Physics

6.0 NUMBER OF EMPLOYEES

The resident staff at NASA-ARC is roughly 5,000+ employees which includes approximately 2,200 civil service employees and 2,800 contract and subcontract employees, grantees, and student interns.

7.0 GENERAL DESCRIPTION OF SITE OPERATIONS

NASA-ARC occupies 421 acres of the 1,700 acre site that constitutes Moffett Federal Airfield (MFA). Stewardship of the Airfield and adjoining property was transferred to NASA-ARC on July 1, 1994, with the closure of the Naval Air Station in response to the recommendation of the Defense Base Closure and Realignment Commission. The estimated contribution of MFA resident agencies is estimated at 15% of the total hazardous waste managed by NASA-ARC, based on routinely generated hazardous wastes received from resident agencies since July 1, 1994. See Section 6.0 of the *Hazardous Waste Management Performance Report*, dated September 1, 1995, for an overall comparison of hazardous waste quantities between NASA-ARC and MFA resident agencies.

7.1 Operations Generating Waste

NASA-ARC utilizes over 40 major technical facilities and approximately 50 ancillary support and administrative facilities to conduct aeronautical, space, earth system, life science, and information system research and development. The primary site operations that contribute to the major hazardous waste streams generated at NASA-ARC are summarized in the following table. Corresponding block diagrams for the processes generating the major waste streams listed are shown in Figures 1 through 7 (see Appendix A).

Waste	Location	Operation(s) Accounting for Majority of Waste	1994 Quantity (lbs.)
Calfran sludge	N203 N241	photodevelopment laboratory	51,600
oil spill cleanup debris	N211 N243 N220 N246C Hangars 1, 2, and 3, Bldgs. 45, 111, 50, 545	aircraft support model machining facilities maintenance (painting, HVAC, mechanical, electrical, plumbing repair and maintenance)	38,260
Labpacks	N239 N240, A N236 N261 N223	various Life Sciences laboratory research activities	37,360
oil w/o halogenated solvents	N229A N227D N221, Hangars 1, 2, and 3, Bldgs. 6, 45, 111, 50, 545	compressor maintenance wind tunnel drive lube system	35,497
contaminated soil	settling basin	clean-out of storm water settling basin	33,383
oil contaminated rags	N211, Hangars 1, 2, and 3, Bldgs. 6, 45, 111, 50	aircraft support wind tunnel support	32,107
JP-5 fuel	N211, Hangars 1, 2, and 3	aircraft support	20,310

7.2 *Hazardous Waste Management Operations*

The majority of routinely generated hazardous wastes (i.e. generated by research activities and facilities maintenance) are controlled and managed by Laidlaw Environmental Services (LES) under contract to SAIC which is under contract to the Office of Safety, Health, and Environmental Services (Code DQH). LES picks up and moves waste from generator pickup locations and satellite accumulation areas to the hazardous waste accumulation pad (N265). The waste is then segregated, repackaged and bulked (if appropriate), and shipped off-site to permitted treatment, storage, and disposal (TSD) facilities.

During the current reporting year, 1994, on-site hazardous waste management services were provided by Chemical Waste Management, Inc. SAIC assumed responsibilities for hazardous waste operations in December of 1994 when the contract was renewed.

Hazardous waste from one-time construction projects contracted through Facilities Engineering, Plant Engineering, and other departments is managed by subcontractors with little or no oversight from DQH. All manifests require DQH review and signature prior to shipment.

8.0 MAJOR WASTE STREAMS

The major routinely generated waste streams (>5% of the total hazardous routinely generated wastes) based on 1994 waste generation quantities is shown in the shaded portions of Table 1 (Appendix B). Extremely hazardous wastes and exempted wastes are also shown. The major waste streams are listed below with corresponding California Waste Codes (CWC). Waste ID numbers listed in parentheses following the CWC are internal waste stream identification numbers used in the NASA-ARC waste container database for tracking purposes.

8.1 Hazardous Wastes

Calfran Sludge	CWC 541	(Waste ID 6)
Oil Spill Cleanup Debris	CWC 352	(Waste ID 11)
Oil without Halogenated Solvents	CWC 221	(Waste ID 22)
Soil, Contaminated	CWC 352	(Waste ID 7565)
Oil Contaminated Rags	CWC 352	(Waste ID 5)
JP-5 Fuel	CWC 331	(Waste ID 3153)
Labpacks	CWC 551	

8.2 Extremely Hazardous Wastes

Hydrochloric Acid Solutions	CWC 791	(Waste ID 8100)
Mercury and Items Containing Mercury	CWC 725	
Labpacks (laboratory chemicals)	CWC 551	

9.0 EXPLANATION OF LARGE VOLUMES OF NON-ROUTINE AND EXEMPT WASTE STREAMS

Some of the larger waste streams which were generated from a non-routine source or one-time event in 1994 are explained below.

9.1 Lead Paint Solids - CWC 181 (Waste ID 9054)

Over 66,000 lbs. of "lead paint solids," Waste ID 9054, were generated in 1994. The bulk of this waste stream (~60,000 lbs.) is attributed to a one-time shipment on January 19, 1994, of a spray paint booth removed from the N211 metal fabrication shop (Code JMF). The booth was contaminated with chromium and lead bearing paint crusts.

Approximately 370 lbs. of the lead paint solids waste stream, primarily aircraft paint dust, plastic blast media, and dust filter assemblies, were generated by the ER2 maintenance group in N211, Room 170. The ER2 maintenance group purchased a polymer bead blasting unit and dust collector to facilitate paint stripping of NASA 708 and 706 ER2 aircraft parts during the 1.5 year long IRaN (inspect and repair as necessary) project. This level of inspection and repair is performed every 10 years to maintain the ER2 fleet. During the previous IRaN project in 1984, paint was removed with conventional paint stripping chemicals.

Since the completion of the IRaN project, use of the bead blasting unit and subsequent generation of paint dusts and filter waste has been limited. The unit is now stored in N259 and used occasionally for parts stripping.

9.2 Water Contaminated with Oil and Fuel - CWC 134 (Waste IDs 12 and 7211)

A total of 247,208 lbs. of water contaminated with oil and 38,000 lbs. of water contaminated with jet fuel was generated in 1994. The majority of these waste streams was from one-time clean-out events involving: Moffett Field Defense Fuel Supply Point (DFSP), Navy Reserve (MMFA/AIMD), NASA fuel farm remedial project, and various cleanup and remedial activities during the unusually rainy 1994 wet season. Some of the sources have been identified as follows.

1) Approximately 1,500 gallons (11,200 lbs.) of water with JP5 fuel oil was pumped from a low point drain on August 5, 1994. The Moffett Field Defense Fuel Supply Point (DFSP) maintains the fuel supply system. The fuel had leaked from an untightened valve on the low point drain of the fuel line that supplies fuel to the day tank from the main fuel tanks by Bldg. 545. The day tank supplies the fuel pits on the flight-line (north of Hangar 2). At the time the fuel/water was discovered, the origin of the fuel was not known and

pumping the pit was considered a priority. The DFSP, which normally handles the pumping of waste fuel/water mixtures and off-specification fuels for transfer to the aboveground storage tanks, contacted the NASA hazardous waste group, as they were prepared to handle the situation immediately. The water and fuel was subsequently pumped, containerized, and shipped off site for disposal and recycling.

2) The Navy Reserves (MMFA) cleaned out waste materials from Hangar 3 that were leftover from Navy operations. The largest waste streams were:

- 5,012 lbs. of water contaminated with oil from ground support equipment (GSE) cleaning,
- 2,255 lbs. of JP5 from T56 engine testing

Although MMFA/AIMD will continue to wash GSE equipment and test T56 engines, these waste streams are not expected to be routinely generated because A) the Navy Exchange will be installing a self-contained (water recirculating) vehicle washing facility at Bldg. 142 that all resident agencies will use for vehicle cleaning and B) the engine test cells will be maintained to minimize contamination of fuels.

3) Nine drums (~3,600 lbs.) of water contaminated with JP5, dirt, and debris were removed from the poly storage (day) tank at the N211 fuel farm prior to cleaning the tank the week of September 16, 1994. This was the initial cleaning of the tank since installation of the remediation system in 1992. The tank is not expected to be cleaned again for the remainder of the operation.

9.3 Spent Abrasives, CWC 181

Spent steel grit and sand blast abrasives were generated from one-time lead paint removal projects. These lead removal projects will decrease over time as the older facilities are renovated and repainted with lead free, environmentally compliant architectural coatings. Currently, the largest generating project is the 40'x80' NFAC Protective Coatings Project which is primarily using a steel grit abrasive. Unlike sand, the steel grit abrasive can be reused up to 100 times before the media is no longer useful. The steel grit is contained, collected, and redirected through the blasting equipment 50 to 100 times. This method greatly reduces the volume of waste as compared to that generated with non-reusable media.

Since this project is already using an economically and technically feasible waste reduction technique and is a lead removal/renovation project producing a major renovation waste, NASA-ARC considers this waste stream exempt under 22 CCR 67100.2(c)(2)(G), and will not include an evaluation of source reduction measures in the plan at this time.

10.0 AQUEOUS HAZARDOUS WASTE STREAMS

The following routinely generated aqueous hazardous waste streams are treated on-site and discharged to a POTW:

1) Condensate (water) contaminated with oil from the air compressors at N229A is filtered through a filter sheet unit prior to discharge to the sanitary sewer. The separator operates by the principle of splitting reaction-adsorption, then filtration through a manual band filter. A batch of the oil/water mixture of approximately 100 gallons is pumped into the unit's 125 gallon capacity reaction tank. Five pounds of a reactive separating agent (quartz dust) is poured into the tank and allowed to mix and react for approximately 5 minutes. The tank contents (the separated sludge and the supernatant clear water) are drained through two discharge nozzles with shut-off valves onto a filter paper supported by a stainless steel wire netting band filter. After drying out, the spent filter material and dry sludge is disposed of as non-hazardous waste. Toxicity testing of the filter waste has shown that the spent filters and dry sludge are not hazardous.

   According to user records, approximately 31,500 gallons (252,000 lbs.) of oily water was treated through the unit in 1994. See Figure 6.

2) Rinsewater from the EA-5 photographic development process in N203 is treated through a Pace ion-exchange system prior to discharge to the sanitary sewer. Silver concentrations in the rinsewater vary, thus, at a given time, may be above or below the hazardous waste limit of 5.0 mg/L. Based on the data points from five (5) sampling events in 1994, silver concentrations in the untreated rinsewater ranged from 0.407 mg/L to 14.8 mg/L. In 1994, 203,050 gallons (1,624,400 lbs.) of rinsewater were treated and discharged. See Figure 7.

11.0 SOURCE REDUCTION MEASURES

Waste reduction measures identified for each of the major waste streams are described below. A description of each waste and the reduction measures is provided.

11.1 Calfran Sludge - Waste ID 6 (CWC 541)

Calfran sludge is a concentrated product residue from the treatment of spent photochemistry from film developing and printing process at the N203 photolaboratory. The Calfran distillation units are part of the treatment system that removes contaminants from spent photochemistry (spent developers and fixers) and reduces the amount of waste shipped off-site as hazardous. The units dehydrate the photochemistry by a low pressure vacuum distillation process. The water removed from the photochemistry is captured and tested and treated (if necessary) through a ion-exchange unit and then discharged to the sanitary sewer. The remaining sludge is drummed and shipped off-site as hazardous waste. The Calfran units reduce the photochemistry waste volume by 80% to 90%.

In late 1995, an additional Calfran 300 unit is expected to be installed in the photolab treatment room. The new unit is expected to increase treatment production and subsequent Calfran sludge output by 30%.

Measure 1: Replace RA-4 Process with Digital Prints

<u>Description</u>

The photolab currently has two digital printers which are used for a limited number of non-aerial applications. After a film negative is developed, the image is scanned into the printer electronically. Once stored electronically, the image can be printed without chemical processing of prints. (The printers are limited to a maximum print size of 11" x 11"). Photochemicals are still used for developing the negative but are eliminated from the printing process. By eliminating the number of RA-4 processed prints, the amount of chemicals used and waste generated is reduced, however, the production cost is increased.

Feasibility

Digital imaging technology currently does not provide the degree of image resolution as that of standard film. Thus, applications requiring high resolution images, such as the aerial photographs collected by NASA planes, cannot use the digital process. Since 75% of the photolab's film production is aerial photographs, the existing digital printers could only be used for the photolab's remaining non-aerial assignments requiring print sizes no larger than 11" x 11". Digital prints are also costly relative to standard prints and take much longer to produce.

The cost of producing digital images from non-aerial film negatives to replace the RA-4 process is shown below. For purposes of analyzing the cost of this alternative, assumptions are based on the number of prints and quantity of Calfran sludge produced for the period of Oct. 1, 1994 to Aug. 14, 1995.

Assumptions:

Fuji machine prints (using RA-4 Chemistry) = 20,409 sheets
Kodak Digital Prints from XLT7720 and XLS 8600PS printers = 1,346 sheets
Fuji paper/chemistry prints = $0.45/sheet
digital prints = $4.20/sheet
RA-4 developer purchase cost = $17.10/box
RA-4 bleach-fix purchase cost = $20.66/box
RA-4 stabilizer purchase cost = $8.88/box
RA-4 developer usage rate = 122 boxes/year
RA-4 bleach-fix usage rate = 121 boxes/year
RA-4 stabilizer usage rate = 240 boxes/year
total Calfran sludge generated = 135 drums
percentage of Calfran waste from Fuji machine = 10%
sludge weight = 560 lbs./drum
Calfran sludge disposal cost = $1.37/lb.

Current Cost:

cost of Fuji prints = 20,409 sheets/year x $0.45/sheet = $9,184/year
cost of digital prints = 1,346 sheets/year x $4.20/sheet = $5,653/year

Total Prints Cost = $9,184/year + $5,653/year = $14,837/year

sludge disposal cost = 10% x 135 drums/year x 560 lbs./drum x $1.37/lb.
= $10,357/year

Total Disposal Cost = $10,357/year

developer purchase cost = $17.10/box x 122 boxes/year = $2,086/year
bleach-fix purchase cost = $20.66/box x 121 boxes/year = $2,500/year
stabilizer purchase cost = $8.88/box x 240 boxes/year = $2,131/year

Total Purchase Cost = $6,717/year

Total Current Cost = **$31,911/year**

Cost of Digital Prints:

total prints = 20,409 + 1,346 = 21,755 sheets/year
cost of prints = 21,755 sheets/year x $4.20/sheet = $91,371/year

Total Cost = **$91,371/year**

Net Annual Savings (Cost): $31,911 - $91,371 = **($59,460)**
Estimated Annual Reduction: **7,560 lbs. (or 10%)**

Recommended for Implementation: NO

Measure 2: Switch to Pre-hardened Film

Description

Kodak is developing a pre-hardened film which does not require the use of pre-hardeners and neutralizers needed for processing standard film in the EA-5 process. Pre-hardener and neutralizer solutions contribute to the total spent photochemistry treated by the Calfran units. Switching to pre-hardened film would reduce the amount of photo-waste to be treated and Calfran sludge generated.

Feasibility

According to the best available information, the new pre-hardened film will be available for use in the EA-5 process by the end of 1995. The savings from switching to the pre-hardened film is shown below.

Assumptions:

pre-hardener usage rate = 293 boxes/year
neutralizer usage rate = 42 boxes/year
pre-hardener mixing ratio = 13.25 gallons/box
neutralizer mixing ratio = 26.5 gallons/box
pre-hardener cost = $88.75/box
neutralizer cost = $70.51/box
Calfran waste reduction percentage = 90% (sludge volume = 10%)
Calfran sludge disposal cost = $1.37/lb.
sludge weight = 400 lbs./drum

Costs Avoided from Using Pre-hardened Film

pre-hardener purchase cost = $88.75/box x 293 boxes/year = $26,004/year
neutralizer purchase cost = $70.51/box x 42 boxes/year = $2,961/year

Total purchase cost = $28,965/year

pre-hardener mixed volume = 13.25 gallons/box x 293 boxes/year
= 3,882 gallons/year
neutralizer mixed volume = 26.5 gallons/box x 42 boxes/year
= 1,113 gallons/year

Total pre-hardener solutions = 3,882 + 1,113 = 4,995 gallons/year

waste volume after treatment = 10% x 4,995 gallons/year = 500 gallons/year
sludge weight = 500 gallons/year x 1 drum/55 gallons x 560 lbs./drum
= 5,090 lbs./year
sludge disposal cost = $1.37/lb. x 5,090 lbs./year = $6,973/year

Total disposal cost = $6,973/year

Total Annual Savings: $28,965 + $6,973 = **$35,938**
Estimated Annual Reduction: **5,090 lbs. (7%)**

Recommended for Implementation: YES

Measure 3: Limited Use of Digital Camera

The photolab has purchased a 35 mm digital camera which uses a CCD array to acquire an image instead of film. The image can be transferred electronically directly from the camera to the printer thereby eliminating the chemicals used to develop the film and process the prints. The camera will be used to shoot some of the assignments currently using film.

There is no estimate for the amount of film the digital camera will replace, therefore the amount of waste reduced is not known. However, the added cost of producing digital images for the benefit of reduced waste, liability, and compliance costs may be acceptable to a point. As in the case of the digital printers, the cost of using the digital imaging on a limited basis is acceptable, while completely replacing standard film with the digital imaging process is cost prohibitive at present.

Recommended for Implementation: YES

11.2 Oil Spill Cleanup Debris - Waste ID 11 (CWC 352)

The spill cleanup debris primarily consists of clay absorbent, rags, absorbent pads, booms and towels, PPE, and miscellaneous soil/dust/debris from floor sweepings.

Roughly 48% (or 18,270 lbs.) of the waste stream is generated during routine maintenance operations by three groups: (1) the Flight Operations Branch, 8,350 lbs. from the clean up of hydraulic fluids and lubricating oils drained from aircraft and ground support equipment, (2) the Model Machining and Contract Fabrication Branch, 6,665 lbs. from the cleanup of coolant, way oil and hydraulic fluid from metal cutting machines in the N220 shop, and (3) the Plant Engineering Branch, 3,255 lbs. from miscellaneous facilities maintenance activities. The remaining 52% is from emergency response cleanups and miscellaneous cleanup activities at over 50 locations throughout MFA.

Measure 1: Segregating and Reusing the Absorbent

Description

Spill cleanup supplies are generally used once and are turned in for disposal. Retaining the used absorbent at the point of generation for subsequent reuse would reduce disposal and purchasing costs. As long the clay absorbent is not saturated, absorbent can be used several times to cleanup the same or compatible types of waste. Users would need to be trained to segregate debris from the absorbent during cleanup. Debris such as gloves, paper, packaging materials, rags, large objects, garbage, etc., that may reduce the effectiveness of the absorbent, should be removed from the absorbent and placed in a separate container during cleanup. The user can then dispose of the waste and keep the absorbent in a drum for the next spill cleanup.

Feasibility

Absorbent can be easily retained and reused by implementing a two-drum system or similar. Initially, one drum is empty and the second drum is filled with new "clean" absorbent. Spill cleanup drums can be mounted on casters to facilitate moving the drums to the spill location. After the absorbent is placed on the spilled material and is ready to be swept and shoveled into a drum, the used "dirty" absorbent is placed into the empty drum. Repeat the procedure for subsequent spill clean-ups until the drum of new absorbent is used up. At this point the full drum of used absorbent is ready to be reused for the next cleanup. Depending on the volume of fluids cleaned up, the absorbent should be re-usable through several cycles of the two-drum system. The absorbent can continue to be used to the point of saturation.

Assuming 80% of the spill cleanup waste is clay absorbent and 20% is debris, the amount of absorbent used for spill cleanup is (0.8)(38,261) = 30,600 lbs. per year. Reusing the absorbent three to four times would cut absorbent use and purchases an estimated 65% to 75% or more. The cost savings is as follows:

Cost Analysis of Reusing Absorbent

Assumptions:

spill cleanup waste volume	= 38,000 lbs./year (based on 1994 vol.)
clay absorbent component of spill cleanup waste	80%
cycles of reuse	3 (33% of current use or 66% reduction)
disposal and transportation (landfill)	$120/drum
weight per drum	350 ibs./drum
absorbent cost	$4.50/50 lb. bag (stores stock item)
absorbent is separated from cleanup debris	

Current Cost:

disposal and transportation	38,000 lbs./year x 1 drum/350 lbs. x $120/drum = $13,029/year
absorbent purchase	38,000 lbs./year x 0.80 x $4.50/50 lbs. = $2,736/year
total	$15,765/year

Cost of Reusing the Absorbent:

disposal and transportation	38,000 lbs./year x 0.80 x 0.33 x 1 drum/350 lbs. x $120/drum = $3,440/year
absorbent purchase	38,000 lbs./year x 0.80 x 0.33 x $4.50/50 lbs. = $903/year
total	$4,343/year

Net Annual Savings: $15,765 - $4,343 = **$11,422**
Estimated Annual Reduction: 38,000 lbs. x 0.66 x 0.80
= 20,266 lbs. (or 53%)

Recommended for Implementation: YES

Measure 2: Change to Incinerable Absorbent

Description

An alternative to cleaning up oil spills with a clay absorbent which is sent for land disposal is to substitute the clay with a combustible material such as saw dust. The combustible absorbent is lighter than clay and can be burned in an industrial incinerator or cement kiln as a supplementary fuel. Three advantages of incinerating the spill cleanup absorbent are:

- eliminate potential liability associated with using a landfill
- recover energy from burning the waste
- reduce the weight of the waste stream and the amount of waste requiring land disposal, in the form of ash

The disadvantages include:

- transfer pollution from one medium to another (i.e. land to air/water)
- combustible absorbents do not absorb oil and viscous fluids as well a clay
- combustible absorbents are difficult to use in windy areas, such as the flight line
- expense

Feasibility

Systec Environmental Corp. has a facility in Kansas that can liquefy the sawdust and oil waste and incinerate for energy recovery. The charge to process the waste at Systec is $165/55-gallon drum with a one time waste profiling fee of $150 (non-hazardous) or $300 (hazardous). An analysis of the cost of using an incinerator versus the current practice of sending the non-combustible clay absorbent to a Class I landfill is given below.

Assumptions:

waste absorbent generation	38,000 lbs./year or 109 drums/year
disposal only Systec facility	$165/drum (55-gallon)
transportation out of state	$85/55-gallon drum
landfill disposal and transportation	$120/drum (55-gallon)
waste clay absorbent weight	350 lbs./drum (55-gallon)
waste sawdust absorbent weight	250 lbs./drum (55-gallon)
volume of sawdust to be generated = volume of clay absorbent generated	

Current Cost:

disposal and transportation	38,000 lbs./year x 1 drum/350 lbs. x $120/drum = $5,828
total	$ 13,028/year

Cost of Systec Facility in Kansas:

disposal and transportation	38,000 lbs./year x 1 drum/350 lbs. x ($85 + $165)/drum = $27,143/year
profiling fee	$150 (non-hazardous waste)
total	$27,293/year

Net Annual Savings (Cost): $27,293/year - $ 13,028/year = **($14,265)**
Estimated Annual Reduction: 38,000 - 38,000 x (250 lbs./350 lbs.) = 10,857 lbs. or 28%

Based on the estimates shown above, sending the absorbent for incineration is cost prohibitive.

Recommended for Implementation: NO

11.3 Contaminated Soil - CWC 352, 611 (Waste ID 7565)

The bulk of contaminated soil in 1994 was from the annual cleaning of the storm water settling basin. The basin was installed as a pollutant removal (pre-treatment) device that captures contaminants in storm water run-off that would otherwise flow into the wetlands and eventually enter the Bay. Approximately 30,000 lbs. of sediment contaminated with metals from storm water run-off was removed from the basin and placed into two bins (one 20 cu. yd. and one 10 cu. yd bin) for off-site landfill disposal. The amount of sediment that accumulates during a given year depends on factors such as annual rainfall amount and on-site construction activity. Prior to removal, the basin sediments are analyzed for metals to determine if the waste meets the characteristic criteria for hazardous waste.

Measure 1: Introduce metal absorbing plants in basin

Description

Plant Engineering Branch is considering a test project to plant a species of metal absorbing plants in the settling basin. Some plants (e.g. Water Hyacinth) have been shown to reduce metals suspended in the water column by absorbing these micro-nutrients through the plant root system. A suitable plant type has not yet been determined. The objective is to reduce the metals deposited in the settling basin sediments. A series of booms will be extended across the basin. The plants would be removed from the basin during annual cleanings when the water is drained from the system.

Also, Plant Engineering Branch has encouraged the growth of a native species of Cattails at the northern effluent end of the settling basin. The Cattails uptake lead and other metals from the water.

Feasibility

Plant Engineering with the support of the Safety Office is seeking additional information from other companies that have successfully implemented a similar plant project. According to Plant Engineering, the plants will likely be in place by the end of this calendar year or early 1996. At this point the exact plant type, cost, and hazardous waste reduction amount is not known, however, a 10% minimum reduction rate is reasonably expected because the lead levels which contributed to the hazardous characteristic of the sediments in past years were borderline. Thus, even a small decrease in lead levels may significantly reduce the quantity of hazardous waste sediments in the basin.

Recommended for Implementation: YES

Measure 2: Cleaning of Storm Drain Catch Basins and Inlets

Description

This option involves a scheduled cleaning of individual catch basins and inlets throughout MFA to prevent contaminants and sediments from entering the collection basin during a storm event.

Feasibility

Plant Engineering Branch has implemented a procedure to hydro-flush and vacuum out catch basins and inlets on a yearly basis during the dry season. Sediments and material removed from catch basins are stockpiled for sampling and analysis prior to disposal. From past clean-outs, the procedure has proven effective in removing accumulated debris contaminated with heavy metals including lead and mercury from the storm collection system. Although the debris removed may require disposal as hazardous waste, implementation of the clean-out procedure prevents these materials from dispersing throughout the settling basin and contributing to the contaminant levels of the basin sediments.

The clean-out schedule has been limited to NASA-ARC catch basins and inlets. Depending on funding restrictions, the schedule may be expanded to include all of Moffett Field. The amount of hazardous waste reduced by this procedure is unknown. A decrease in contaminated basin sediments of 10% to 20% may be reasonably expected if the schedule is expanded to include all of Moffett Field.

Recommended for Implementation YES

11.4 Oil Contaminated Rags - CWC 352 (Waste ID 5)

Equipment maintenance and minor spill cleanup are the primary sources of oil contaminated rags. The largest generating activities are: 1) maintenance of Unitary wind tunnel equipment (11,800 lbs. or 37% of waste stream), 2) wipe cleaning of models, engines, motor generator parts, etc. by the NFAC group in N221 (7,400 lbs. or 23%), 3) flight support wipe cleaning of aircraft exterior and hydraulic struts (4,175 lbs. or 13%), 4) equipment wipe cleaning by Thermo Physics Facilities branch at N229A (1,960 lbs. or 6%).

Measure 1: Rag Laundry Service

Description

Most rags are used once then discarded. A rag laundry service allows for the reuse of most contaminated cloth rags thereby saving disposal costs and purchase costs of new cloth or paper wipes. Rags are typically laundered and reused 8 to 11 times before being replaced. The laundry then sells these used rags to other companies for use on ships and overseas.

Feasibility

The Unitary group currently uses a rag laundry service. The Safety Office initiated the service in March 1994. The laundry service does not eliminate waste rags but reduces the amount of rags requiring disposal by approximately 90%. Rags soaked with solvents or contaminated with metals or asbestos cannot be laundered. The potential savings of expanding the service to the remaining generators is given below. Assumptions do not include Unitary rag usage because service is already in place.

Cost Analysis of Rag Laundry Service

Assumptions:

waste drum weight	150 lbs./drum
oily rags generated	20,271 lbs. (excluding rags generated by Unitary group)
transportation and disposal cost	$120/drum
cloth rags cost	$50/bail
cloth rags usage	10 bails/mo. (average)
laundry cost	$0.045/rag
laundry usage	9,000 rags/month
laundry rags requiring disposal	10%

Current Costs:

disposal and transportation	20,271 lbs./year x 1 drum/150 lbs. x $120/drum = $16,217/yr.
cloth rag purchases	$50/bail x 10 bails/month x 12 mo./yr. = $6,000/yr.
total	$22,217/yr.

Laundry Costs:

service rate	$0.045/rag x 9,000 rags/mo. x 12 mo./yr. = $4,860/yr.
disposal	(10%) x (20,271 lbs./yr.) x 1 drum/150 lbs. x $120/drum = $1,622/yr.
total	$6,482/yr.

Net Annual Savings: $22,217 - $6,482 = **$15,735**
Estimated Annual Reduction: **18,000 lbs. (or 89%)**

Recommended for Implementation: YES

11.5 Oil without Halogenated Solvents - CWC 221 (Waste ID 22)

The largest generators of oils without solvent contamination are the Thermo Physics Facilities Branch (Code RTF) and the Aerodynamic Facilities Branch (Code RAF), which combined generated 21,000 lbs. of oil without halogenated solvents (~60% of the total) in 1994. Code RTF generates synthetic lube oils (Firequill 550) and Mobile DTE-BB from the maintenance of the air compressors at N229A and N250 and from infrequent oil changes from the cooling tower fan gear boxes.

Approximately 8,000 lbs. of oil was generated at N227D from routine maintenance of the wind tunnel drive and MUA compressor lube systems. Waste oil is generated from preventive maintenance of the Unitary Complex 50,000 CFM air compressor, vacuum pumps, and other mechanical systems. Oil and filter changes are performed approximately every six months on ~20 vacuum pumps and the air compressor. Oil is also captured in containment trays from equipment leaks.

Measure 1: Refurbish Unitary Facility

Description

The Unitary Facility is undergoing a large modernization effort which will result in the upgrading and replacing of virtually all equipment associated with the operation of the Unitary Wind Tunnel Complex at N227D. NASA-ARC has already realized an estimated 63% reduction in CFC-12 emissions with the removal of the 40+ year old refrigeration system in April of 1995. According to Calspan maintenance personnel, waste oil from equipment leaks will be reduced as a result of replacing the vacuum pumps, air compressors, and other equipment containing oil, with new equipment under the modernization project.

Feasibility

The amount of waste oil to be reduced as a result of upgrading the Unitary equipment is not known. Assuming one quarter of the waste oil generated is from leak containment trays, a maximum of 2,000 lbs. (or 6%) of oil would be saved. An evaluation of the cost impact is irrelevant since the reduction is subsequent to a project already underway.

Recommended for Implementation: YES

Measure 2: Reduce frequency of oil changes

Description

This measure involves changing the oil in the compressors and vacuum pumps on a less frequent basis, thereby reducing the amount of waste oil generated and new oil used in the equipment. However, decreasing oil change frequency increases mechanical wear.

Feasibility

All Unitary equipment oil changes are done on a preventive maintenance (PM) schedule specified by the manufacturer of the equipment. Changing the schedule to decrease oil waste at the expense of potential mechanical downtime is not justifiable for mission critical applications at the Center.

The oil quality of the air compressors at N229A and N250 is checked by analyzing samples of oil for impurity levels on a weekly basis. The oil analyses are critical to the continued operation of the compressors. Once the analyses show impurities above the acceptable levels, the oil must be changed out to protect the equipment from damage.

Recommended for Implementation: NO

11.6 JP-5 Fuel - CWC 331 (Waste ID 3153)

Fuel is required to be removed from aircraft during tank servicing and maintenance and cannot be placed back into an aircraft for reuse. The waste fuel is subsequently picked-up for off-site disposal. Waste fuels are currently sent to a fuels blending facility and incinerated as a supplemental fuel. A smaller amount of fuel/water mixture is generated from fuel testing.

Measure 1: Reuse of jet fuel in aircraft ground equipment (AGE) vehicles

Description

This measure utilizes JP-5 waste removed from aircraft fuel tanks in aircraft ground support equipment (AGE).

Feasibility

Approximately 40 AGE vehicles for the Flight Support Division are currently equipped to run on JP-5, of which only about 20 vehicles are used on a somewhat regular basis. On a given day, approximately 3 AGE vehicles are in use. The fuel consumption rate of the AGE vehicles varies depending on the

level of maintenance activity performed inside the hangar as opposed to outside. On a slow month, when activity outside the hangar is minimal, the vehicles will consume approximately 15 gallons. During a more active month, when most of the work is performed outside the hangar, the consumption rate is 200 to 400 gallons.

The current practice is to not use JP-5 that has been defueled from aircraft due to the potential for contamination. The contaminants of concern are water and debris/particulates. Fuel removed from aircraft is generally free of debris/particulates. Water in the fuel is generally the result of condensation in the fuel tank from pressure changes during flight. However, most of the aircraft are equipped with a water separation mechanism. Water present in fuel is easily checked with a fuel sample jar. Debris is typically introduced during fuel transfer into a dirty container. Procedures to ensure that these contaminants are either removed or are not present would need to be implemented prior to using the JP-5 in the AGE vehicles.

One suggestion for ensuring fuel loads are clean would be to filter the fuel to remove the particulates after checking for water content. The filtered fuel would then need to be stored in a clean, labeled mobile tank or bowser from which maintenance crew members could fill the AGE vehicles. When not in use, the tank should be stored in a secondary containment structure and included in the weekly inspection currently performed by the users. A cost analysis for implementing this fuel reuse program is given below.

Cost Analysis of JP-5 Reuse

Assumptions:

AGE fuel consumption	300 gallons/month (average)
fuel transportation and disposal cost	$0.44/lb.
purchase cost of fuel (for AGE)	$1.30/gallon
waste fuel volume	20,000 lbs./year
waste fuel supply will meet consumption demand of AGE vehicles	
purchase cost of 500 gallon fuel storage tank (trailer mounted)	$1,500
purchase cost of collapsible secondary containment	$1,000
waste fuel not re-usable	20%
operator wage	$50/hr.
operator time to check fuel for water	0.25 hrs./defueled batch 1 batch/week (average)

Current Cost:

fuel disposal	20,000 lbs./year x $0.44/lb. = $8,800/yr.
fuel purchase (for AGE only)	$1.30/gal. x 300 gal./mo. x 12 mo./yr = $4,680/yr.
total	$13,480/yr.

Fixed (One Time) Costs of Fuel Reuse Program:

portable 500 gallon fuel tank	3 tanks x $1,500/tank = $4,500
collapsible secondary containment for portable 500-gallon fuel tank	3 units x $1,000/unit = $3,000
total	$7,500

Variable Costs of Fuel Reuse Program:

fuel disposal	20% x 20,000 lbs./yr. x $0.44/lb. = $1,760/yr.
operator costs to check fuel and maintain tank	$50/hr. x 0.25 hrs/batch x 4 batches/mo. x 12 mo./yr. = $600/yr.
total	$2,360/year

One Time Cost:	$7,500
Net Monthly Savings:	$11,120/year x 1 year/12 mo. = $927/mo.
Payback Period:	$7,500/($927/mo.) ~ 8 mo.
Net Annual Savings After Payback:	$13,480 - $2,360 = **$12,000/year**
Estimated Annual Reduction:	**16,000 lbs. (80%)**

<u>Recommended for Implementation</u>: YES

11.7 Hydrochloric Acid Solutions - CWC 791 (Waste ID 8100)

Hydrochloric acid solutions are generated in relatively small quantities by laboratory research activities and some facilities maintenance cleaning activities. The total generation quantity for 1994 is estimated at 1,500 lbs. In 1994, laboratory quantities of reagent grade hydrochloric acid were lab-packed and sent off-site for treatment by incineration. The cost associated with disposal will be significantly reduced in 1995 as acid solutions are now bulked into drums for treatment and disposal.

Measure 1: Waste Acid Detoxification and Reclamation (WADR) Process

Description

The WADR system uses a vacuum distillation technique to remove metals and impurities from spent acids and produce purified concentrated acid. The manufacturer estimated acid recovery rate is 90+%. The system would reduce acid waste disposal cost and purchase costs of new acid solutions.

Feasibility

Viatec Recovery Systems, Inc., the WADR system licensee, was contacted to evaluate the applicability of this technology to NASA-ARC waste acid solutions. NASA-ARC provided a spent acid data sheet as requested by Viatec to get an evaluation of the appropriate system for NASA-ARC and cost specifications. After reviewing our data sheet, Viatec determined that the acid waste stream for NASA-ARC was too small for the WADR acid recovery system to be cost effective. The systems typically require waste acid generation rates of at least 10 gallons/hour to be cost effective.

Recommended for Implementation: NO

11.8 Labpacks - CWC 551

Labpacks consist of small laboratory size containers of compatible wastes packaged in accordance with DOT requirements and TSD facility specifications. Labpacks are generally the most expensive method of disposing of hazardous waste, since only a small volume of material is allowed in each container. For incinerable labpacks or "charges," the majority of the labpack volume is occupied by an absorbent packing material. The primary method available for reducing this waste stream is minimizing the amount of laboratory chemicals requiring disposal, either through modified laboratory procedures or, more likely through a chemical redistribution program.

Measure 1: Implement a Chemical Redistribution Program

Description

A redistribution program promotes the use of surplus chemicals by providing a centralized inventory of available chemicals to potential laboratory users. By offering unused chemicals to other users, the Center saves disposal costs of unwanted chemicals and purchase costs of new chemicals.

Feasibility

In July 1995, NASA-ARC re-initialized the Ames Chemical Exchange (ACE), a chemical redistribution program maintained by the Office of Safety, Health, and Environmental Services. The program has had limited success but will increase chemical reuse with promoted employee awareness of the program. The program is described in detail in Appendix C.

Recommended for Implementation: YES

Measure 2: Implement Procedure for Segregating Out Non-Hazardous Laboratory Chemicals

Description

This measure requires developing of a written procedure or non-hazardous waste list to enable chemical users to determine which materials are not hazardous per Title 22 requirements. Materials submitted to the hazardous waste management group are already segregated and put aside according to an existing non-hazardous waste list. Non-hazardous waste is then placed in the regular garbage.

Feasibility

A NASA-ARC specific Non-Hazardous Waste List for chemical users is under development and will be incorporated into a new interactive laboratory user training software package purchased from Stanford University. The List will be used to allow chemical users to identify and remove non-hazardous wastes from their waste pickup requests. Based on past experience, the amount of non-hazardous waste to be segregated out is less than 5% of the total waste turned in for disposal.

Recommended for Implementation: YES

12.0 EVALUATION OF SOURCE REDUCTION MEASURES

A matrix format has been used to evaluate and compare the source reduction measures identified in this plan. The matrix allows for calculating a relative overall numeric score based on criteria listed in 22 CCR Section 67100.5(k). The criteria weight factors and the scoring applied to each measure within the criteria are explained below.

12.1 Evaluation Criteria and Weight Factors

The reduction measures described in Section 11 have been ranked and given an overall score for recommending implementation. The following criteria have been assigned a weight factor according to their relative importance to NASA operations and policy and current budget conditions within the agency.

	Criteria	Weight
1	expected change in the amount of hazardous waste generated	9
2	technical feasibility	6
3	economic feasibility	8
4	effects on product quality	10
5	employee health and safety implications	10
6	regulatory compliance	10
7	releases and discharges	9

Rationale for Assigning Weight Factors

Safety, product quality, and regulatory compliance are the highest priority in conducting business at NASA-ARC and are thus given the highest weight factor of ten. Releases and discharges to all media, and change in waste quantity are considered of secondary importance to safety, quality, and compliance but are of higher priority than the other factors, thus are assigned a weight factor of nine.

Economic feasibility is the next consideration and is assigned a weight of eight. Recent agency restructuring and planned budget cuts over then next few years will impact the importance of economic considerations in all operations at the Center. As a result, economic feasibility of source reduction measures will be of higher relative importance than in previous years. In the 1990 Plan, economic feasibility was assigned a weight factor of six.

Technical feasibility is the final consideration in recommending a source reduction measure and is assigned a weight of six.

12.2 *Scoring of Measures*

Where applicable, each measure was scored on a scale of 1 to 10 within the above criteria according to the expected impacts of implementing the source reduction measure. Within each criteria, the scores represent the following:

	Criteria	Explanation of Score (scale is 1 to 10)
1	expected change in the amount of hazardous waste generated	1 = 10% reduction 2 = 20% reduction, etc.
2	technical feasibility	1 = least feasible 10 = most feasible
3	economic feasibility	1 = least benefit per cost 5 = no economic impact 10 = most benefit per cost
4	effects on product quality	1 = strong negative impact 5 = no impact 10 = strong positive impact
5	employee health and safety implications	1 = strong negative impact 5 = no impact 10 = strong positive impact
6	regulatory compliance	1 = strong negative impact 5 = no impact 10 = strong positive impact
7	releases and discharges	1 = increase in releases to media 5 = no net change 10 = decrease in releases to media

The matrices showing overall evaluations are presented in Appendix D.

12.3 *Multimedia Impacts of Recommended Measures*

To the extent practicable, the reasonably anticipated impacts to air, water, and land by implementing the source reduction measures are qualified as follows.

Waste	Reduction Measure	Air Impacts	Water Impacts	Land Impacts
Calfran Sludge	switch to pre-hardened film	possibly reduce	reduce	no significant change
	limited use of digital camera	possibly reduce	reduce	no significant change
Oil Spill Cleanup Debris	segregating and reusing absorbent	no significant change	no significant change	reduce
Soil, Contaminated	introduce metal absorbing plants in basin	no significant change	reduce	possibly reduce
	cleaning of storm drain catch basins and inlets	no significant change	possibly reduce	possibly reduce
Oil Contaminated Rags	rag laundry service	no significant change	increase	reduce
Oil w/o Halogenated Solvents	refurbish Unitary facility	no significant change	no significant change	no significant change
JP-5	fuel reuse program	no significant change	no significant change	no significant change
Labpacks	chemical redistribution program	no significant change	no significant change	possibly reduce
	non-hazardous waste list for chemical users	no significant change	no significant change	reduce

12.4 *Implementation Timetable for Source Reduction Measures*

Waste	CWC	Reduction Measure	Target for Implementation
Calfran Sludge	541	switch to pre-hardened film; limited use of digital camera	FY 1996 FY 1996
Oil Spill Cleanup Debris	352	segregate and reuse absorbent	FY 1996
Contaminated Soil (settling basin sediments)	352	introduce metal absorbing plants in basin; cleaning of storm drain catch Basins	FY 1996 FY 1995
Oil Contaminated Rags	352	rag laundry service	FY 1996 to FY 1997
Oil w/o Halogenated Solvents	221	refurbish Unitary facility	FY 1998 to FY 1999
JP-5	331	fuel reuse program	FY 1997 to FY 1998
Labpacks	551	chemical redistribution program; non-hazardous waste list	FY 1995 FY 1996

13.0 FOUR YEAR GOAL

Based on the source reduction measures identified and recommended, the following reduction volumes are anticipated over the next four years. The overall estimated reduction goal resulting from successfully implementing the recommended measures is calculated below.

Waste	CWC	Reduction Measure	Current Waste Quantity (lbs.)	Estimated Reduction Quantity (lbs.)
Calfran Sludge	541	switch to pre-hardened film; limited use of digital camera	76,160	5,000 no est.
Oil Spill Cleanup Debris	352	segregate and reuse absorbent	38,261	20,000
Contaminated Soil (settling basin sediments)	352	introduce metal absorbing plants in basin; cleaning of storm drain catch Basins	33,383	3,300 3,300
Oil Contaminated Rags	352	rag laundry service	32,107	18,000
Oil w/o Halogenated Solvents	221	refurbish Unitary facility	35,497	2,000
JP-5	331	fuel reuse program	20,310	16,000
Labpacks	551	chemical redistribution program; non-hazardous waste list	37,360	no est. 1,800
TOTALS			278,178	64,300
% REDUCTION				23%

Four Year Numeric Goal: 23% reduction of major routinely generated waste streams

APPENDIX A

FIGURE 1 - PHOTOGRAPHIC DEVELOPMENT

NASA-Ames Research Center

Year: 1994

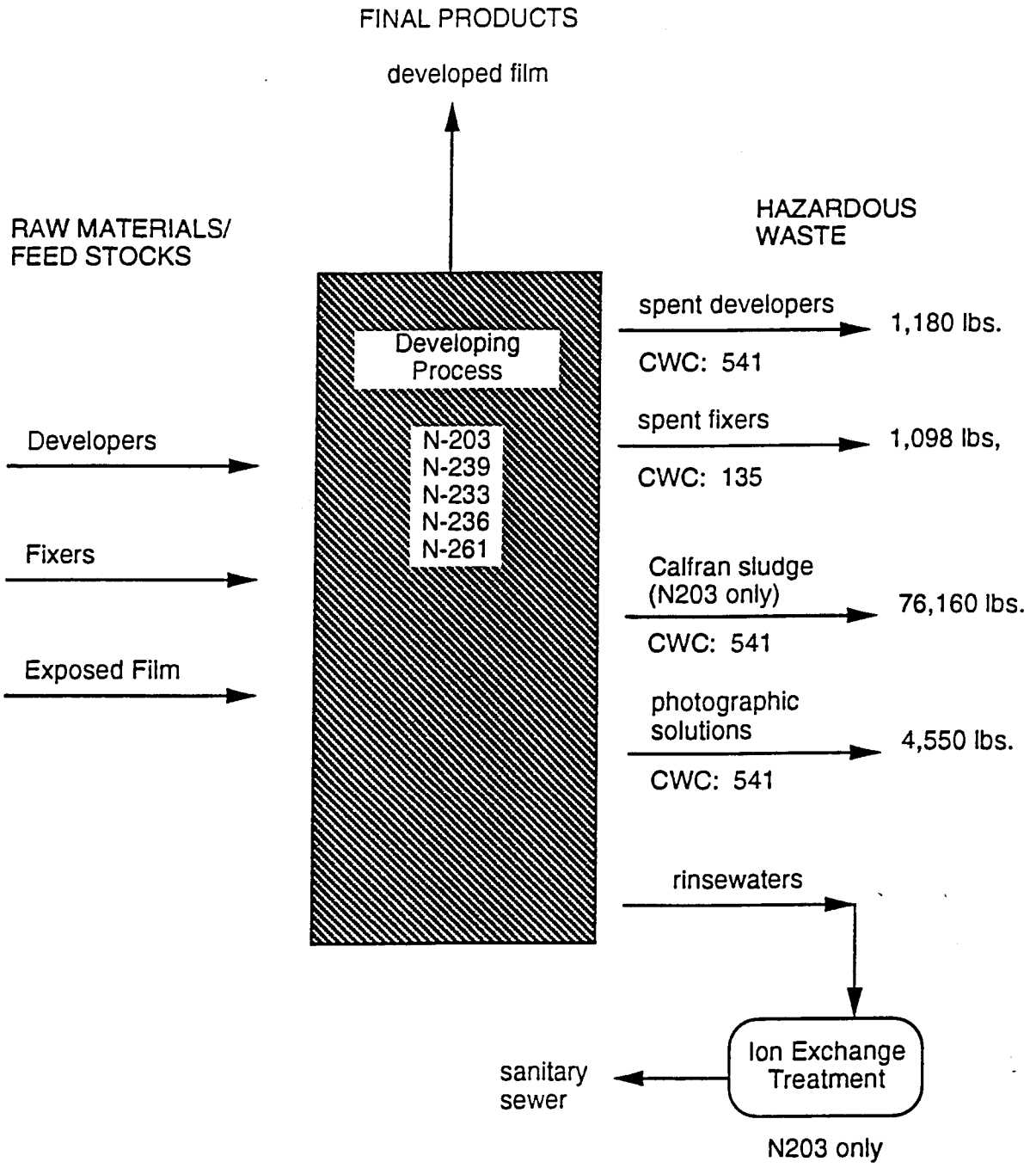


FIGURE 2 - AIRCRAFT SUPPORT

NASA-Ames Research Center

Year: 1994

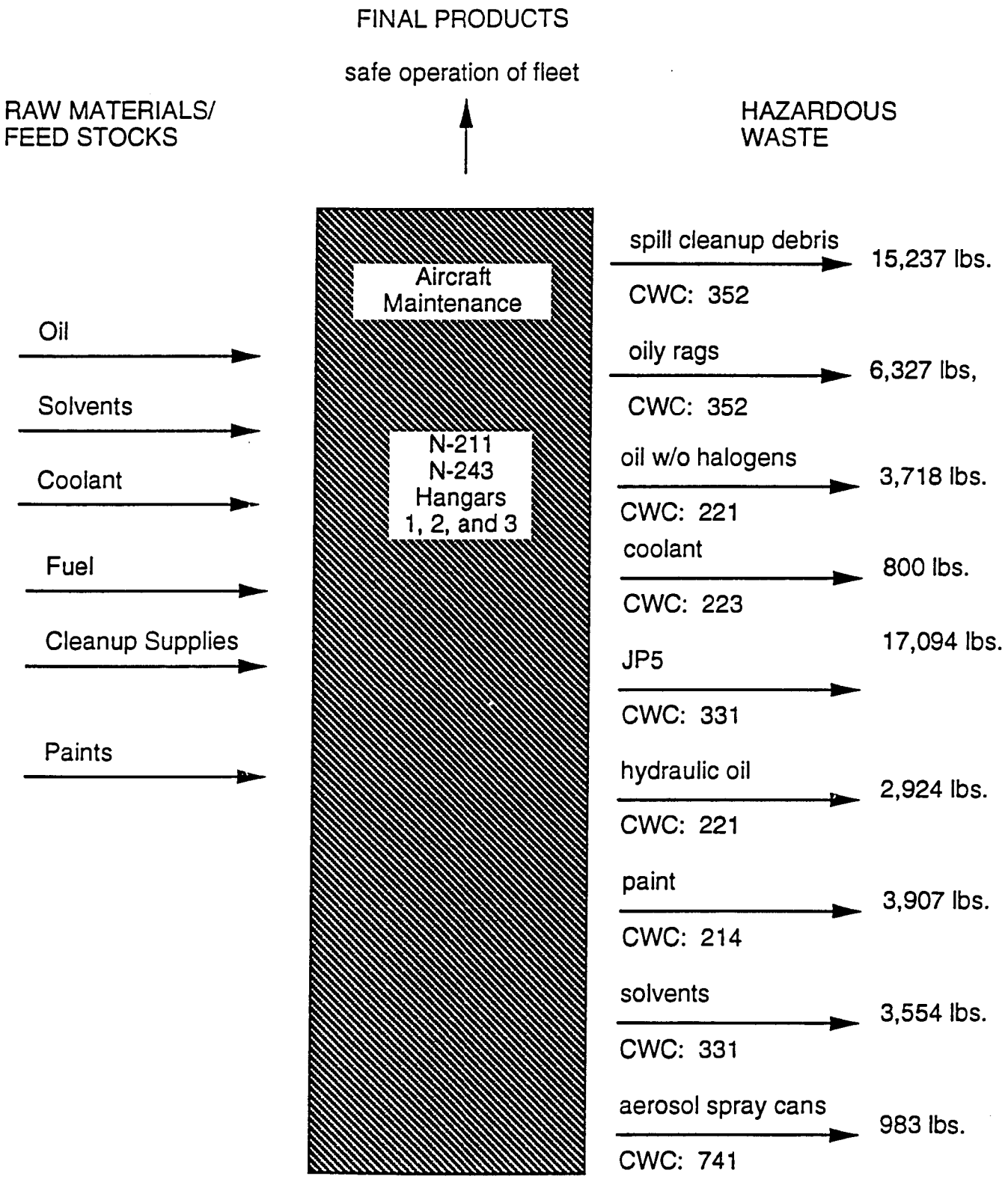


FIGURE 3 - MODEL MACHINING AND FABRICATION

NASA-Ames Research Center

Year: 1994

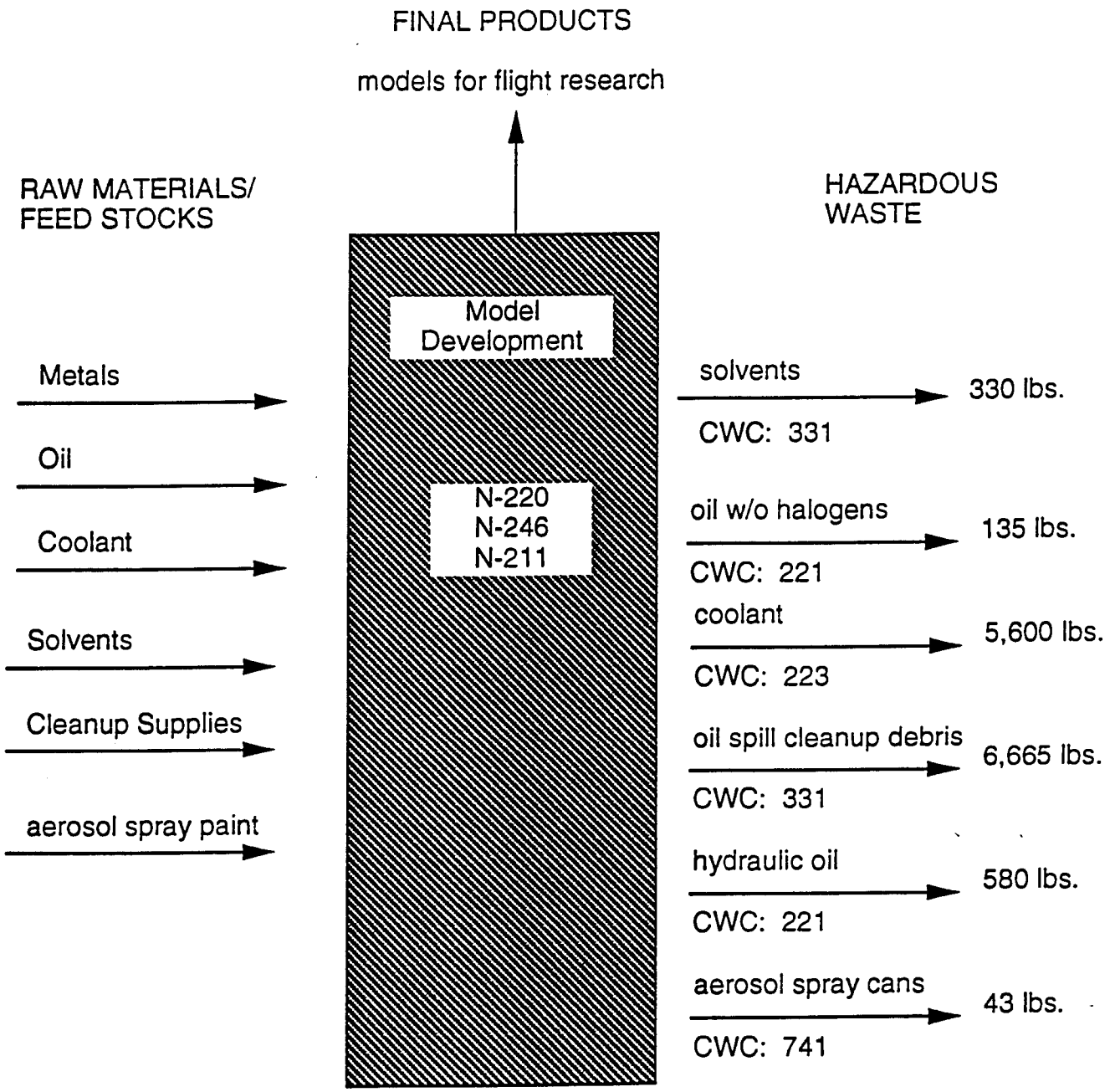


FIGURE 4 - WIND TUNNEL SUPPORT

NASA-Ames Research Center

Year: 1994

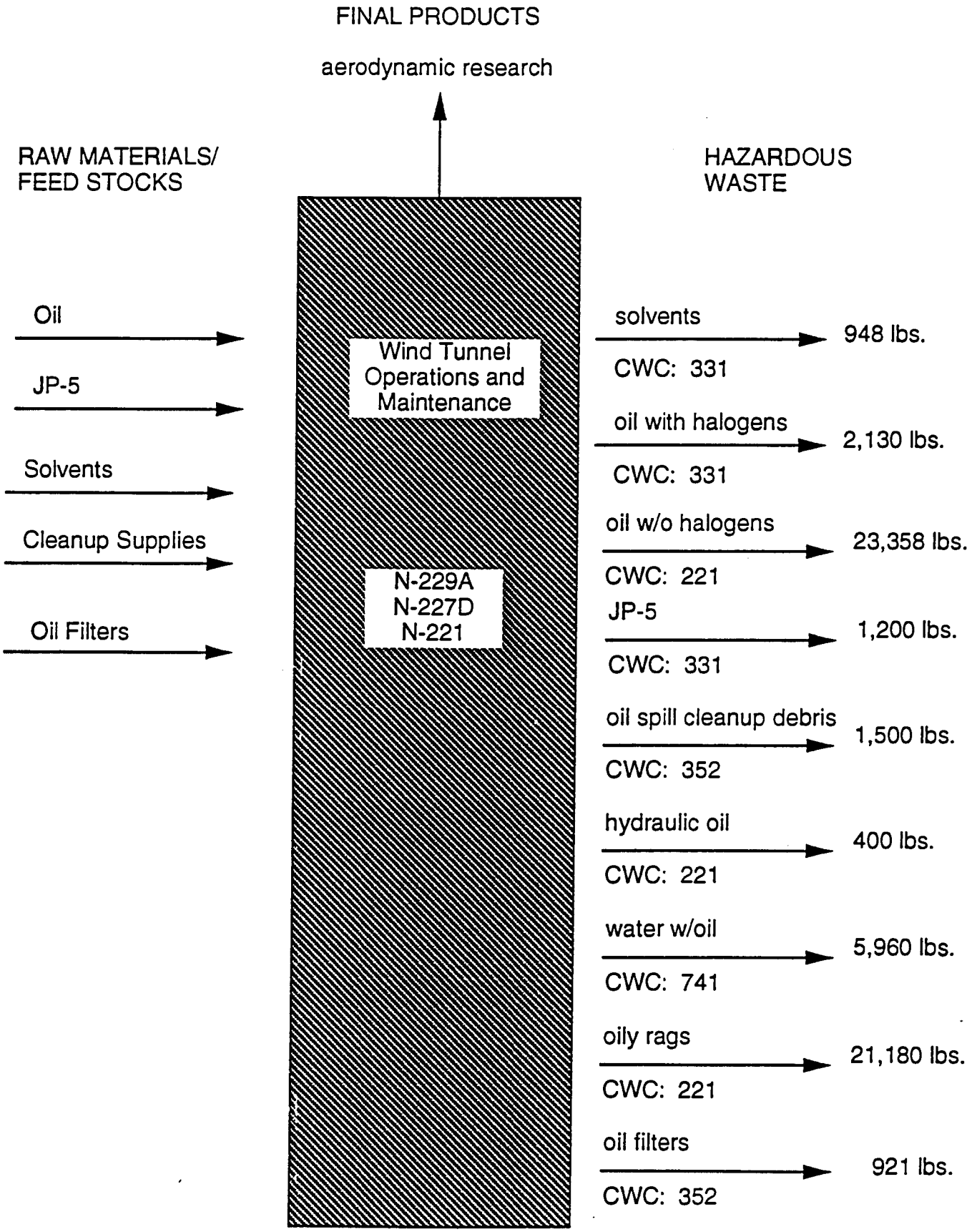


FIGURE 5 - FACILITIES MAINTENANCE

NASA-Ames Research Center

Year: 1994

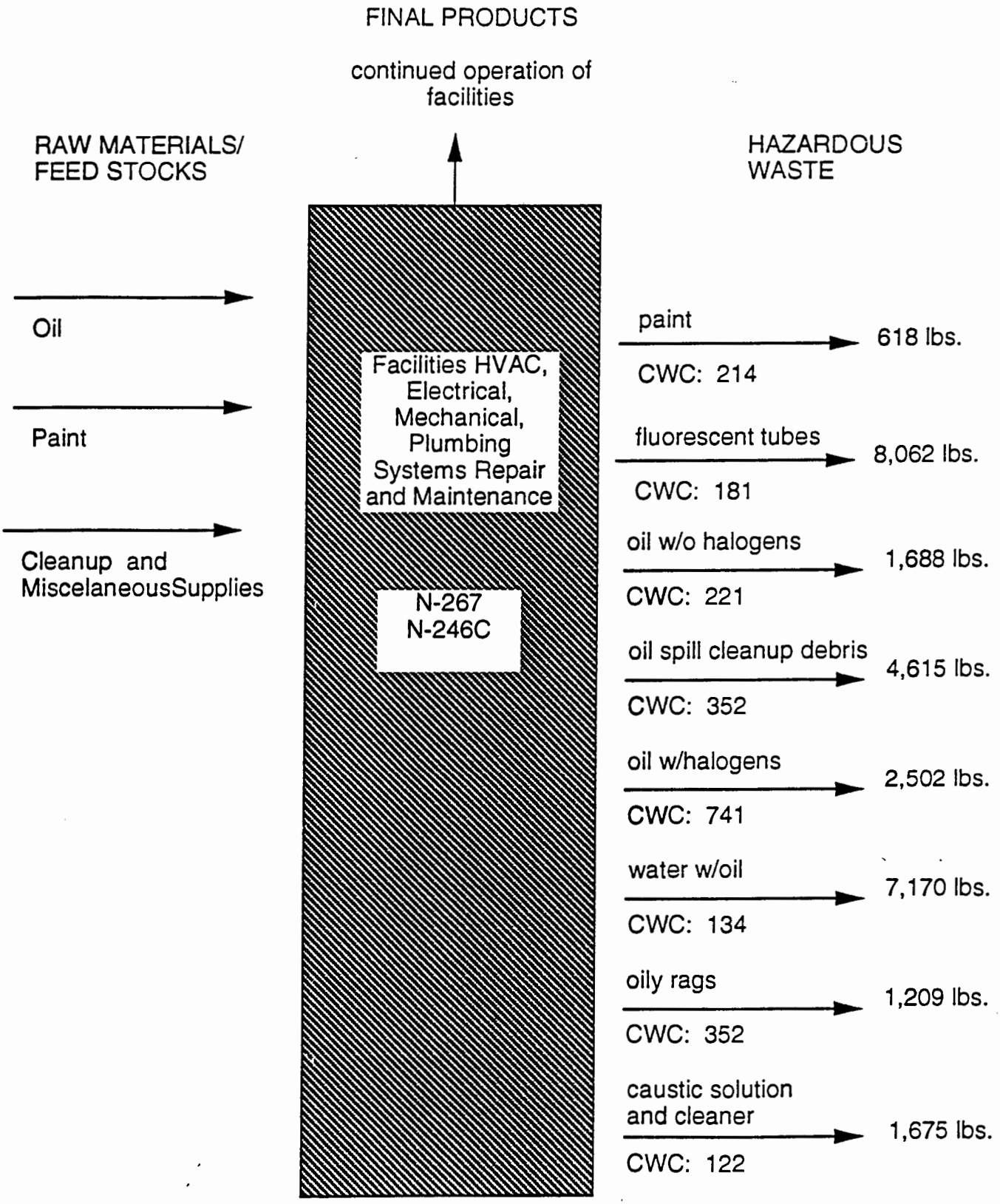


FIGURE 6 - N229A WATER/OIL FILTRATION UNIT

NASA-Ames Research Center

Year: 1994

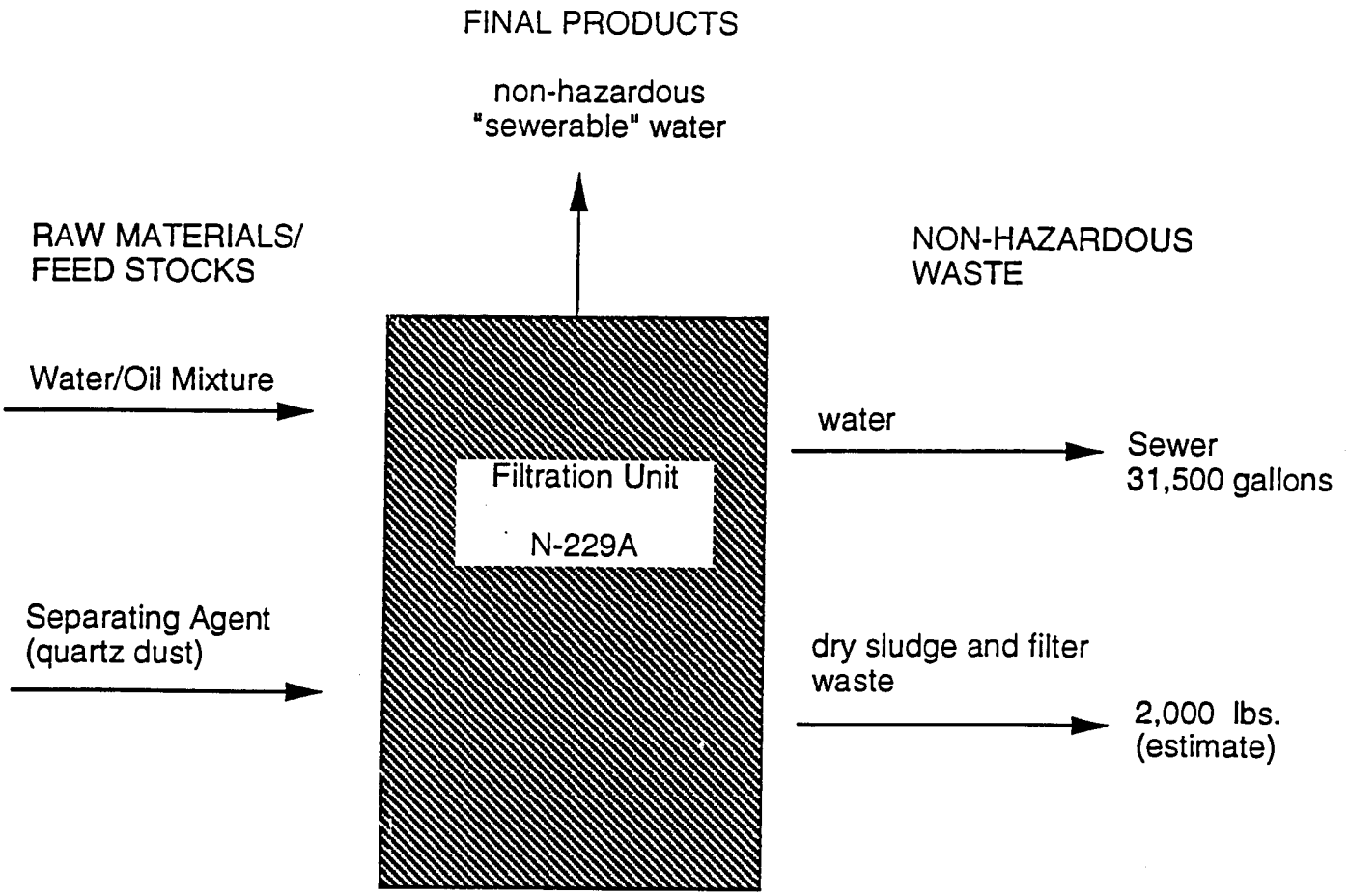
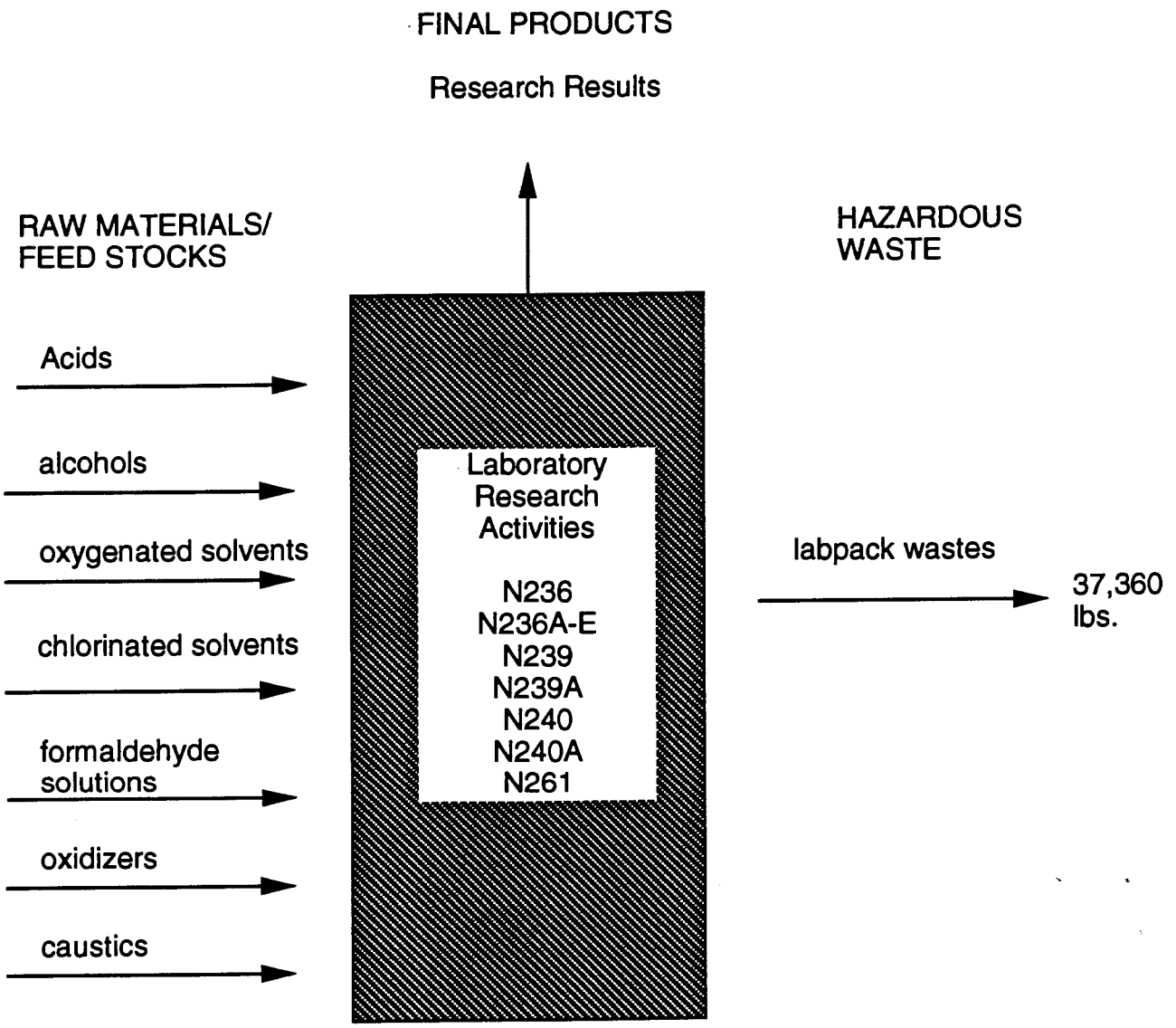


FIGURE 7 - LABORATORY RESEACH ACTIVITIES

NASA-Ames Research Center

Year: 1994



APPENDIX B

WASTE GENERATION QUANTITIES FOR NASA AMES RESEARCH CENTER (ARC) AND MOFFETT FEDERAL AIRFIELD (MFA) 1994									
					ARC	MFA	TOTAL		
Waste Stream	Waste No.	CWC	Waste Type	Frequency	lbs.	lbs.	lbs.	%	TOTAL BY CWC
caustic solutions/cleaners	8537	122	H	R	2,097	917	3,014	1%	3,014
electrolyte solution	1	132	H	R	4,400	0	4,400	1%	4,400
PD 680	7571	134	H	R	0	2,718	2,718	1%	2,718
batteries, Ni-Cad	8516	181	H	R	777	480	1,257	0%	
batteries, mercury	8498	181	H	R	9	904	913	0%	
batteries, alkaline	8515	181	H	R	260	536	796	0%	
batteries, lithium	9059	181	H	R	21	224	245	0%	
batteries, silver-zinc	8530	181	H	R	185	0	185	0%	3,396
1,1,1-TCA	6062	211	H	R	405	0	405	0%	
freon/freon water	28	211	H	R	648	2	650	0%	1,055
ethanol	3104	212	H	R	243	0	243	0%	243
paint thinner	3086	213	H	R	4,099	1,338	5,437	1%	5,437
paint, flammable	3087	214	H	R	3,039	4,318	7,357	2%	7,357
oil, w/o halogenated solvents	**22**	**221**	**H**	**R**	**30,540**	**4,957**	**35,497**	**9%**	
oil, hydraulic	20	221	H	R	6,269	7,193	13,462	4%	48,959
coolant, oil	none	223	H	R	8,240	600	8,840	2%	8,840
JP-5 fuel	**3153**	**331**	**H**	**R**	**5,240**	**15,070**	**20,310**	**5%**	
solvents	3102	331	H	R	10,763	2,327	13,090	3%	
diesel fuel	3012	331	H	R	895	1,400	2,295	1%	35,695
oil spill cleanup debris	**11**	**352**	**H**	**R**	**32,666**	**5,595**	**38,261**	**10%**	
oil contaminated rags	**5**	**352**	**H**	**R**	**29,435**	**2,672**	**32,107**	**9%**	
spent activated carbon	none	352	H	R	3,500	0	3,500	1%	
grease	7100	352	H	R	1,066	1,309	2,375	1%	76,243
cooling tower sludge	9071	491	H	R	840	0	840	0%	840
empty crushed containers	7	513	H	R	15,744	47	15,791	4%	
compressed gas cylinders	none	513	H	R	119	0	119	0%	15,910
Calfran sludge	**6**	**541**	**H**	**R**	**76,160**	**0**	**76,160**	**20%**	
Pace resin	7280	541	H	R	800	0	800	0%	
photographic solutions	various	541	H	R	3,914	636	4,550	1%	81,510
labpacks	**none**	**551**	**H**	**R**	**37,360**	**0**	**37,360**	**10%**	**37,360**
Calla 505	none	561	H	R	400	0	400	0%	
soil, contaminated	**7565**	**611**	**H**	**R**	**33,383**	**0**	**33,383**	**9%**	**33,383**
H=hazardous waste									
E=extremely hazardous waste									
W=non-hazardous waste									
R=routinely generated wastes									
N=non-routinely generated wastes									
X=wastes exempted by 22CCR 67100.2(c)									

WASTE GENERATION QUANTITIES FOR NASA AMES RESEARCH CENTER (ARC) AND MOFFETT FEDERAL AIRFIELD (MFA) 1994									
					ARC	MFA	TOTAL		
Waste Stream	Waste No.	CWC	Waste Type	Frequency	lbs.	lbs.	lbs.	%	TOTAL BY CWC
oil, w/halogenated solvents	21	741	H	R	7,209	216	7,425	2%	
aerosol spray cans, flammable	2508	741	H	R	733	984	1,717	0%	
aerosol spray cans, non-flamm.	2000	741	H	R	101	285	386	0%	9,528
TOTALS					321,560	54,728	376,288	100%	
H=hazardous waste									
E=extremely hazardous waste									
W=non-hazardous waste									
R=routinely generated wastes									
N=non-routinely generated wastes									
X=wastes exempted by 22CCR 67100.2(c)									

WASTE GENERATION QUANTITIES FOR NASA AMES RESEARCH CENTER (ARC) AND MOFFETT FEDERAL AIRFIELD (MFA) 1994									
					ARC	MFA	TOTAL		
Waste Stream	Waste No.	CWC	Waste Type	Frequency	lbs.	lbs.	lbs.	%	TOTAL BY CWC
EXTREMELY HAZARDOUS WASTES									
labpacks*	**none**	**551**	**E**	**R**	**174**	**0**	**174**	**10%**	**174**
hydrochloric acid solutions	**8100**	**791**	**E**	**R**	**1,460**	**40**	**1,500**	**90%**	**1,500**
TOTALS							1,674	100%	
*includes: sodium cyanide 2.1 lbs, calcium hypochlorite 4 lbs., sodium cacodylate 0.355 lbs.,									
hydrofluoric acid 167 lbs., arsenic compounds 0.875 lbs.									
EXEMPT AND NON-ROUTINELY GENERATED WASTES									
ethylene glycol	7106	133	H	X	662	1,255	1,917	0%	
water contaminated w/oil	12	134	H	N	230,996	16,212	247,208	23%	
well water, clean	7210	134	W	X	2,000	0	2,000	0%	
asbestos containing material	9055	151	H	X	394,975	0	394,975	37%	
sand blast grit	none	181	H	X			230,400	21%	
steel grit abrasive	none	181	H	X	35,396	0	35,396	3%	
water w/fuel	7211	241	H	X	37,992	8	38,000	4%	
PCB oil	9070	261	E	X	4,275	0	4,275	0%	
PCB light ballasts	2	261	E	X	4,865	91	4,956	0%	
PCB capacitors	9, 10	261	E	X	460	0	460	0%	
PCB contaminated solid	9060	261	E	X	264	0	264	0%	
detergent	7073	331	W	R	234	1,963	2,197	0%	
gasoline	3044	331	H	X	780	1,315	2,095	0%	
latex paint	7076	331	W	R	1,002	746	1,748	0%	
cooling tower debris	26	352	H	R	15,000	0	15,000	1%	
lead paint solids	9054	352	H	N	65123	900	66023	6%	
batteries, lead acid	8128	352	H	X	2,896	3,635	6,531	1%	
JP5 filters	7128	352	H	X	1,750	22	1,772	0%	
oil filters, drained	7182	352	H	X	1,280	3,066	4,346	0%	
empty drums for recycling	77	512	W	R	15,155	1,238	16,393	2%	
mercury	8500	725	E	X	23	0	23	0%	
mercury filled items	8499	725	E	X	379	0	379	0%	
TOTALS					815,507	30,451	1,076,358	100%	
H=hazardous waste									
E=extremely hazardous waste									
W=non-hazardous waste									
R=routinely generated wastes									
N=non-routinely generated wastes									
X=wastes exempted by 22CCR 67100.2(c)									

APPENDIX C

AMES CHEMICAL EXCHANGE (ACE) PROGRAM

SAFETY • HEALTH • ENVIRONMENTAL

REVISED:

January 22, 1996

PREPARED FOR:

NASA Ames Research Center
Moffett Field, California

BY:

SAIC

AMES CHEMICAL EXCHANGE (ACE) PROGRAM

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ATTACHMENTS

A. ACE INVENTORY (Sample)

B. FORM RC - Chemical Request Form

C. FORM A - Chemical Material/Waste Pickup Request Form

D. CHEMICAL REDISTRIBUTION REPORT (Sample)

E. ACE FLYER

F. ASTROGRAM ARTICLE, February 24, 1995

G. ECO-NOTES ARTICLE, March 9, 1995

AMES CHEMICAL EXCHANGE (ACE) PROGRAM

1.0 Purpose and Description

This procedure sets forth elements and requirements of the Ames Chemical Exchange (ACE) Program, a chemical redistribution program established and maintained by the Office of Safety, Health and Environmental Services, Code DQH, NASA Ames Research Center. As part of NASA's efforts to minimize waste, the ACE program promotes the use of surplus chemicals by providing a centralized inventory of available chemicals to potential users. Individuals/organizations that use chemicals from the ACE inventory will save purchase costs of new chemicals and disposal costs of unwanted yet usable chemicals.

2.0 Applicability

This procedure applies to all NASA-Ames Research Center civil service and contract employees who purchase chemicals for government use.

3.0 Availability

Materials listed on the ACE inventory are available to Ames resident staff, Moffett Field resident agencies, and other NASA installations.

4.0 Policy

It is the policy of NASA Ames Research Center to promote reuse of excess chemicals as part of the NASA's efforts to minimize hazardous waste.

5.0 Responsibilities

5.1 Chemical purchasers - employees requesting to purchase chemicals shall:

a) check the ACE Inventory for product availability <u>prior</u> to purchasing new chemicals (see sample sheet from inventory in ATTACHMENT A);

b) request chemicals from ACE using FORM RC (see ATTACHMENT B).

5.2 Code DQH - the Environmental Office shall:

a) deliver chemicals to the location requester designates on FORM RC;
b) update inventory as items are donated and requested;
c) prepare a written report each quarter summarizing the costs saved by redistributing chemicals through the program.

6.0 Background

All materials in the ACE inventory are stored in the Central Chemical Storage Facility (CCSF) at N239A. The CCSF consists of six (6) individual chemical storage cells secured by a chain link fence. Between April and June of 1995, the Environmental Office coordinated the clean out of the CCSF to remove all unusable, unwanted materials. Owners and former owners of materials in the CCSF were notified via posted announcements in laboratory buildings and QuickMail™ to determine which materials were no longer wanted.

Beginning July 1995, all remaining materials that were potentially usable and unclaimed were re-entered into the ACE. Each container in the inventory is now identified by a unique ID number (ACE ID) which is assigned to the container when entered into the inventory. The ID label affixed to the container also includes the quarter and year the container was entered into the inventory.

7.0 Operations

7.1 Accessing the ACE Inventory

The inventory of chemicals can be accessed by two means:

a) Macintosh users linked to the centerwide network can access the inventory on the ACE share folder as follows.

(1)	Under the "apple" menu select	**Chooser**
(2)	Select	**AppleShare**
(3)	Click on AppleTalk Zone	**DQ/N19**
(4)	Select File Server	**Ames Chemical Exchange**
(5)	Connect to File Server as	**Guest**
(6)	Select share item	**ACE**

(7) Exit the Chooser - the ACE folder (with snake icon) will appear on your desktop.

(8) Open folder on your desktop and open file named "ACE Inventory." Copy the file to your hard drive and drag file server icon to Trash.

You will need Excel® 4.0 (or later version) to open. The inventory is in Read-Only format. You can trash the file when you've finished reviewing the inventory as it gets updated frequently.

b) anyone with access to the world wide web (WWW) can view the inventory and submit order forms electronically from the AMES DQH HOME PAGE at:

http://**dqh.arc.nasa.gov.**

Click on **DQH Infobase**.

7.2 Requesting a Chemical

a) Scan the inventory and note which item(s) you want on Form RC - the chemical request form. (See ATTACHMENT B or call the ACE coordinator at ext. 4-3532 for a copy of Form RC). **Requests can be made electronically from the WWW AMES DQH HOME PAGE**.

b) Send completed forms to the ACE Coordinator at M/S 19-21. Allow 2 to 3 working days for delivery (at Moffett Field only). Requesters at other NASA installations must pay for shipping to their location.

c) Material Safety Data Sheets (MSDSs) will be delivered with the requested items.

7.3 Donating a Chemical

a) Use Form A (see ATTACHMENT C) - the Chemical Material/Waste Pickup Request Form - and check the box labeled "Reuse" under the column heading "Handling Instructions."

b) Submit completed forms to LAIDLAW at M/S 19-21. The items will be picked up and placed into the ACE inventory. The ACE coordinator will update the inventory according to the information submitted.

7.4 Materials to Donate

Most chemicals with the following characteristics may be donated to ACE:

- unopened containers
- original intact, sealable containers with original labels
- solid materials are pourable and have not aggregated
- liquids are not solidified or do not exhibit phase separations
- liquids that should be clear are clear
- liquids do not show signs of crystallization or crusting

7.5 Chemical Inventory Database

The ACE coordinator maintains the master database on an Excel® spreadsheet. The database is setup on a file server to enable network linked users to share and read the inventory. Specific fields from the master database will be exported to a web server to expand user access to anyone hooked up to the Internet. The master database lists chemicals alphabetically by name and includes the following information for each container. Each line item in the database represents an individual container or package. Multiple containers of the same material are listed as individual line items.

chemical name	technical name that appears on container label. (The trade name or common name may also be listed in parentheses).
ACE ID	unique number assigned to each container
cell	name of storage cell in which container is located at CCSF
size	capacity of container in units specified in column to the right
unit	unit of measure for container
type	container material type
condition	container has been opened or still has the factory seal or appears unused
volume remain.	volume of material in container expressed as a percentage of the container capacity
date added	date chemical was entered into inventory
date removed	date chemical was removed from the inventory and delivered to the requester
removed for	individual who requested the chemical
expiration date	date specified by manufacturer as indicated on the label
estimated value	estimated purchase cost of chemical

7.6 Inventory Management

Beginning one year after re-initializing the program (July 1996), the inventory will be purged of unwanted items every quarter. Each quarter the database will be sorted to identify items that have been in the inventory over a year. Items in the inventory after one year, and not exceeding the manufacturers' expiration date, will be turned over to the property disposal group, Code JFS, to enter the donation and public sale screening process. Items not donated or sold through the screening process will be given to the hazardous waste management group for disposal. Opened items will be managed as waste and not given to the property disposal group.

Depending on CCSF space availability and material shelf life, the Environmental Office may retain some or all items beyond the one year period.

7.7 Chemical Redistribution Reports

The ACE coordinator will prepare a report (see sample report in ATTACHMENT D) documenting the amount and type of chemicals donated for reuse through the ACE program. The report will list each item removed from the inventory, the date it was removed, who requested the item, and the estimated value of the item. The report will also give the total costs saved in new chemical purchases avoided and disposal costs avoided, **excluding labor**.

8.0 Marketing

The ACE program is marketed to Ames employees through two primary methods: 1) the Generator Outreach Program, and 2) the DQH training program. In an effort to expand the ACE program to all of Moffett Field, the Environmental Office will present the program to Resident Agencies (RAs) at RA briefings.

The Outreach Program provides a means of soliciting generator input on hazardous waste issues. The field chemist completes a questionnaire (Form B - Generator Assistance Form) at the generators' waste pickup location. At that time, the generator is asked if he/she is aware of the ACE program. If not, the field chemist will give a flyer (see ATTACHMENT E) detailing the ACE program to the generator. The ACE flyer is also distributed to attendees during the hazardous

waste management/environmental essentials training course offered through Code DQH.

The ACE program is periodically publicized through announcements in the *Astrogram* (see ATTACHMENT F), and Eco-Notes, a monthly publication of environmental topics sponsored by DQH contract support and distributed to resident staff via QuickMail™ (see ATTACHMENT G).

ATTACHMENT A

Chemical	ACE ID	Cell	Size	Unit	Type	Condition	Volume Remain.	Date Added	Date Removed	Removed For	Expir. Date	Estimated Value
ether (for anaesthesia)	68	FL	0.25	lb.	metal	unopened	100%	7/5/95				
ether, isopropyl	132	FL	1	pint	glass	unopened	100%	7/11/95				
ether, petroleum, ACS	119	FL	1	gallon	metal	opened	50%	7/11/95				
ethyl acetate	20	FL	1	gallon	glass	opened	100%	7/5/95				
ethyl acetate	30	FL	1	gallon	glass	opened	25%	7/5/95				
ethyl acetate	31	FL	1	gallon	glass	opened	25%	7/5/95				
ethyl acetate	47	FL	1	quart	glass	unopened	100%	7/5/95				
ethylene glycol	206	POIS	1	gallon	glass	opened	100%	7/12/95				
ethylene glycol	207	POIS	1	gallon	glass	opened	100%	7/12/95				
ethylene glycol	208	POIS	1	gallon	glass	opened	100%	7/12/95				
ethylene glycol	209	POIS	1	gallon	glass	opened	100%	7/12/95				
ethylene glycol	210	POIS	1	gallon	glass	opened	100%	7/12/95				
formaldehyde, (methanol free) E.M. grade	244	POIS	1	quart	bottle in can	unopened	100%	7/12/95				
formaldehyde, (methanol free) E.M. grade	245	POIS	1	quart	bottle in can	unopened	100%	7/12/95				
formaldehyde, (methanol free) E.M. grade	246	POIS	1	quart	bottle in can	unopened	100%	7/12/95				
formalin, 10% buffered neutral	247	POIS	1	gallon	glass	unopened	100%	7/12/95				
formalin, 10% buffered neutral	248	POIS	1	gallon	glass	unopened	100%	7/12/95				
glycerin, USP	252	POIS	1	pint	glass	opened	25%	7/12/95				
glycerol, 99%	253	POIS	1	gallon	poly	opened	90%	7/12/95				
hepes	232	POIS	100	grams	poly	unopened	100%	7/12/95				
hepes	233	POIS	250	grams	poly	unopened	100%	7/12/95				
hydrochloric acid, 0.968 N	158	ACID	1	liter	poly in box	unopened	100%	7/11/95				
hydrochloric acid, 0.968 N	159	ACID	1	pint	poly in box	unopened	100%	[illegible]				
hydrochloric acid, 0.968 N	160	ACID	1	pint	poly in box	unopened	[illegible]	[illegible]				
hydrochloric acid, 1 N	161	ACID	1	quart	glass	[illegible]	[illegible]	[illegible]/95				
hydrochloric acid, 37%	134	ACID	1	gallon	glass	[illegible]	[illegible]	7/11/95				
hydrochloric acid, 37%	135	ACID	1	gallon	[illegible]	[illegible]	[illegible]00%	7/11/95				
hydrochloric acid, 37%	136	ACID	1	gal[illegible]	[illegible]	[illegible]ened	100%	7/11/95				
hydrochloric acid, 37%	137	ACID	1	gallon	glass	unopened	100%	7/11/95				
hydrochloric acid, 37%	138	ACID	1	gallon	glass	unopened	100%	7/11/95				
hydrochloric acid, 37%	139	ACID	1	gallon	glass	unopened	100%	7/11/95				
hydrochloric acid, 37%	140	ACID	1	gallon	glass	unopened	100%	7/11/95				
hydrochloric acid, 37%	141	ACID	1	gallon	glass	unopened	100%	7/11/95				
hydrochloric acid, 37%	157	ACID	1	pint	glass	opened	100%	7/11/95				
hydrochloric acid, 37%	163	ACID	1	pint	glass	unopened	100%	7/11/95				
hydrochloric acid, 37%	164	ACID	1	pint	glass	unopened	100%	7/11/95				
hydrochloric acid, 37%	165	ACID	1	pint	glass	unopened	100%	7/11/95				
hydrochloric acid, 37%	166	ACID	1	gallon	bottle in box	unopened	100%	7/11/95				
hydrochloric acid, analytical conc., 1 N (makes 1L)	196	ACID	36.4	grams	vial in box	unopened	100%	7/11/95				
iodine-povidone, U.S.P. (Acudyne Prep. Sol.)	238	POIS	1	gallon	poly	unopened	100%	7/12/95				
iodine-povidone, U.S.P. (Acudyne Prep. Sol.)	239	POIS	1	gallon	poly	unopened	100%	7/12/95				
lithium carbonate	243	POIS	1	lb.	glass	opened	50%	7/12/95				
magnesium acetate, tetrahydrate	268	POIS	100	grams	poly	opened	30%	7/12/95				
magnesium chloride, anhydrous, 98%	261	POIS	100	grams	glass	unopened	100%	7/12/95				
magnesium chloride, anhydrous, 98%	262	POIS	100	grams	glass	unopened	100%	7/12/95				
magnesium chloride, anhydrous, 98%	263	POIS	100	grams	glass	unopened	100%	7/12/95				

SAMPLE

ATTACHMENT B

FORM RC

AMES CHEMICAL EXCHANGE (ACE) CHEMICAL REQUEST FORM
NASA Ames Research Center

Mail to: ACE Coordinator, M/S 19-21 **Phone: 4-3532**

Requester Name:_____ Phone:_____ Org. Code/Company_____

Date:_____ Alternate Contact Name:_____ Alternate Phone:_____

Please deliver the following items listed on the ACE Inventory *(allow 2 to 4 days for delivery)*:

CHEMICAL NAME	ACE ID#	CELL (e.g. FL)	CONTAINER SIZE (e.g. 1 pint)

TOTAL NUMBER OF ITEMS REQUESTED:_____

Deliver to: Bldg.:_____ Room:_____ Requester's Signature_____

SAIC/LAIDLAW USE ONLY: **Date request received:**_____ **Received by:**_____
Date items delivered:_____ **Delivered by:**_____

ATTACHMENT C

FORM A

Mail to: LAIDLAW, M/S 19-21
Phone #: 415-407-4606

Chemical Material/Waste Pick-up and Container Delivery Request Form
NASA Ames Research Center

Revision: 10
Date: 15 March 1995

Primary Contact Name:_____ Phone:_____ Org. Code/Company:_____ Building/Room No:_____ Date:_____

Pick-up/Delivery Location:_____ Restricted Access? Y/N:____ Alternate Contact Name:_____ Phone:_____

Directions: Please complete form as accurately as possible. Refer to reverse side for further instructions.

→ ☐ PICK UP THE FOLLOWING CONTAINERS:

Item No.	☐ Satellite† ☐ 90-day 1st Date of Accumulation	No. / Size / Type of Container (e.g., 1gal/metal can)	Waste Component (s) and Percent(s) (e.g., acetone 80%, water 20%)	Physical State & Hazardous Properties (e.g., Liquid - Flammable)	Handling Instructions (e.g., Waste OR Reuse*)	LAIDLAW USE ONLY: Waste Stream #	Container #	ACE # / Cell #
	/ /				☐ Waste ☐ Reuse* or			/
	/ /				☐ Waste ☐ Reuse* or			/
	/ /				☐ Waste ☐ Reuse* or			/
	/ /				☐ Waste ☐ Reuse* or			/
	/ /				☐ Waste ☐ Reuse* or			/
	/ /				☐ Waste ☐ Reuse* or			/
	/ /				☐ Waste ☐ Reuse* or			/
	/ /				☐ Waste ☐ Reuse* or			/

† As of 1/1/95, all satellite accumulation areas must have DQH written approval/permit. Contact SAIC at Ext. 4-6295 to obtain this approval.
*Reuse specifies uncontaminated, usable, or "off-spec" product you want to donate for reuse through Ames Chemical Exchange (ACE). Contact SAIC at Ext. 4-3532

I certify that this information is true and accurate to the best of my knowledge. _____ Requester's Signature _____ Today's Date

→ ☐ DELIVER THE FOLLOWING CONTAINERS††: Number:_____ (e.g., 1) Size:_____ (e.g., 55 gal) Type:_____ (e.g., steel open top drum)

††Refer to reverse side for sizes and types of containers available from LAIDLAW.

LAIDLAW USE ONLY: Date Request Received:_____ By: _____ Date Containers Picked Up/Delivered: _____ By: _____

OVER

NOTE: Complete one Form A per collection area (90 day or Satellite Accumulation Area).

1. General Information

Please complete this information as clearly and accurately as possible.

2. Container Pick-up Information

- √ - Check the box marked "PICK UP THE FOLLOWING CONTAINERS"
- Number each container as a line item
- Check Either "Satellite" for satellite accumulation area or "90-day" for 90-day accumulation area. If you do not know which type of storage area applies (i.e. Satellite or 90-day) call SAIC at 4-6295 and ask for assistance or refer to Chapter 2 of the Ames Environmental Handbook.
- Enter the "1st Date of Accumulation" for each item. The "1st Date of Accumulation" is the date that waste is first placed in the waste container or declared waste or if the material is available for reuse, the date when material is no longer needed or becomes "off-spec". Note: Satellite accumulation allows up to 270 days storage for no more than 55-gallons of hazardous waste or 1 quart of acutely or extremely hazardous waste. However, as soon as container becomes full, it must be moved to a 90-day storage area within 3 days. Contact SAIC at 4-6295 for more information.
- Number (No.) / Size / Type of Container: Indicate the size and type of the container containing the waste (e.g., 1 quart poly bottle, 55 gallon steel open top drum, etc.).
- Waste Component(s) and Percent(s): Indicate the individual components making up the waste and the relative percent of each (e.g., acetone 10-15%, water 85-90%).
- Physical State and Hazardous Properties: Indicate the physical state of the waste (e.g., liquid, solid, or gas) and the hazardous properties of the waste (e.g. toxic, flammable, corrosive, reactive, etc.).
- Handling Instructions: Indicate whether chemical is a waste or a material to be donated to the Ames Chemical Exchange (ACE) (e.g., virgin chemical product usually in original container - Questions? - Call SAIC at 4-3532.)

FORM A EXAMPLE: You have a 90-day accumulation area with a drum of oily rags, two nicad batteries, a drum of oil contaminated clay absorbent and 3 bottles of unused hydrochloric acid. You would complete the section as follows:

→ [√] PICK UP THE FOLLOWING CONTAINERS:

Item No.	[ ] Satellite† [√] 90-day 1st Date of Accumulation	Size / Type of Container (e.g.1gal/metal can)	Waste Component(s) and Percent(s) (e.g. acetone 80%, water 20%)	Physical State & Hazardous Properties (e.g. Liquid - Flammable)	Handling Instructions (e.g. Waste OR Reuse*)
1	1/9/99	1 x 55-gallon drum	petroleum based oil 5-10%, cotton rags 90-95%	solid/toxic	[√] Waste [ ] Reuse* or
2	1/2/99	2 x 2lb battery	nicad batteries 100%	solid/toxic	[√] Waste [ ] Reuse* or
3	1/15/99	1 x 55-gallon drum	clay sorbent 99-100%, petroleum based oil 0-1%	solid/toxic	[√] Waste [ ] Reuse* or
4	1/9/99	3 x 1-liter glass bottles	hydrochloric acid 100%	liquid/corrosive	[ ] Waste [√] Reuse* or
	/ /				[ ] Waste [ ] Reuse* or
	/ /				[ ] Waste [ ] Reuse* or
	/ /				[ ] Waste [ ] Reuse* or
	/ /				[ ] Waste [ ] Reuse* or

- Please sign and date the certification statement.

3. Container Delivery Information:

Complete this section if you need empty containers for hazardous waste collection. Refer to table below for available containers. For example, you need two (2) each 55-gallon open top steel drums to collect solid material. You would complete the section as follows:

Number 2 *Size* 55 *Type* *steel open top*

Container Information- Containers available through Laidlaw

SIZES	TYPE AND USES
SMALL •	•500-ml plastic bottle (for liquids) •1- gallon plastic bottle (for liquids and solids)
MEDIUM ••	••5-gallon plastic bucket (for solids) ••5-gallon plastic carboy (for liquids) ••30-gallon steel open top drum (for solids)
LARGE •••	•••55-gallon steel closed top drum (for liquids) •••55-gallon steel open top drum (for solids) •••55-gallon poly open top drum (for solids) •••55-gallon poly closed top drum (for liquids)
X-LARGE ••••	••••85-gallon poly overpack drum*

*The 85-gallon poly overpack drum is for overpacking leaking drums or for secondary containment.

ATTACHMENT D

Chemical	ACE ID	Cell	Size	Unit	Type	Condition	Volume Remain.	Date Added	Date Removed	Removed For	Expir. Date	Estimated Value
acetaldehyde	none	FL	1	gram					5/1/95	Alka		$50
acetone	none	FL	1	gallon					5/1/95	Alka		$30
alcohol, anhydrous	none	FL	1	gallon		opened			3/15/95	May Wang		$35
benzene	none	FL	500	ml		unopened			5/1/95	Alka		$18
benzene	none	FL	500	ml		unopened						$18
butyl alcohol	none	FL	1	gallon		opened			3/15/95	May Wang		$33
citric acid monohydrate	none	POIS	500	grams		unopened		1/24/94	4/12/94	Arthur Webber		$9
dichloromethane	none	POIS	1	gallon		unopened			6/9/95	Samual Akapo		$7
dimethyl sulfoxide	none	POIS	500	ml		unopened		1/24/94	4/12/95	Arthur Webber		$27
ethanol, 200 proof	none	FL	1	pint		unopened			4/25/95	Babak Alizadeh		$10
ethanol, 200 proof	none	FL	1	pint		unopened			4/25/95	Babak Alizadeh		$10
ethanol, 200 proof	none	FL	1	pint		unopened			4/25/95	Babak Alizadeh		$10
ethanol, 200 proof	none	FL	1	pint		nopened			4/25/95	Babak Alizadeh		$10
ethanol, 200 proof	none	FL	1	pint		pened			4/25/95	Babak Alizadeh		$10
ethanol, 200 proof	none	FL	1	pint		ened			4/25/95	Babak Alizadeh		$10
formaldehyde solution	none	POIS	1	pint					5/5/95	Anne Thorpe		$10
formaldehyde solution	none	POIS	1	pint					5/5/95	Anne Thorpe		$10
hexane	none	FL	1	gallon					8/24/94			$65
hydrochloric acid, 37%	none	ACID	1	gallon					6/12/95	George Cooper		$50
hydrochloric acid, 37%	none	ACID	1	gallon		u			5/4/95	K. Kasser		$50
methanol	none	FL	1	gallon					4/27/95	Alka		$25
methanol	none	FL	1	gallon		unop			4/25/95	Babak Alizadeh		$25
methanol	none	FL	1	gallon		unopen			4/25/95	Babak Alizadeh		$25
methylene chloride	none	POIS	1	gallon					4/27/95	Alka		$40
nitric acid, 70%	none	ACID	1	pint					5/4/95	K. Kasser		$40
pentane	none	FL	1	gallon		opened		5/5/95	6/12/95	George Cooper		$60
phosphate buffered saline tabs	249	POIS	50	tablets	poly	unopened	100%	7/12/95	7/13/95	Darrel Bowles		$20
Propanol, 1-	none	FL	1	gallon		unopened			3/15/95	May Wang		$20
scintilation fluid (Econofluor)	none	FL	1	gallon					4/25/95	Babak Alizadeh		$20
scintilation fluid (Econofluor)	none	FL	1	gallon					4/25/95	Babak Alizadeh		$20
sulfuric acid	154	ACID	1	gallon	glass	opened	60%	7/11/95	7/14/95	K. Kasser		$33
toluene	none	FL	1	gallon		opened			6/9/95	Samuel Akapo		$31
Total Estimated Value												$831

TOTAL POUNDS AND COSTS SAVED (excluding labor)	No.	Unit	lbs.	$/lb.	Disposal Cost
solvents/solutions	15.4	gallons	123	$0.44	$54.12
acids	3.13	gallons	40.6	$0.65	$26.41
solids	600	grams	1.32	$0.40	$0.53
TOTALS			165		$81.05

SAMPLE

ATTACHMENT E

AMES CHEMICAL EXCHANGE
(ACE)

If you are or will be considering a chemical purchase, Ames currently has an inventory of chemical materials *FREE* for the taking. Chemical materials are stored in the Central Chemical Storage Facility (CCSF) located at the northeast corner of N239A, facing N210. Macintosh users need only check the ACE Inventory by accessing the share folder as follows:

(1)	Under "apple" menu select	**Chooser**
(2)	Select	**AppleShare**
(3)	Click on AppleTalk Zone	**DQ/N19**
(4)	Select File Server	**Ames Chemical Exchange**
(4)	Connect to File Server as	**Guest**
(5)	Select share item	**ACE**
(6)	Exit the Chooser - the ACE folder will appear on your desktop.	
(7)	Open folder on your desktop and open file named "ACE Inventory." Copy the file to your hard drive and drag file server icon to Trash.	
	You will need Excel 4.0 (or later version) to open. The inventory is in Read-Only format. You can trash the file when you've finished reviewing the inventory as it gets updated frequently.	

COMING SOON: LOOK FOR THE ACE INVENTORY ON THE WWW - ON THE AMES DQH HOMEPAGE AT http://snowhite.arc.nasa.gov.

NOTE: the ACE Inventory is in the process of a complete overhaul. As such, many chemicals that are available may not yet be listed.

If you have any questions or would like to get an item, contact:

Mark Lacy at extension 4-3532

Ames Chemical Exchange (ACE) Program

Description

The Ames Chemical Exchange (ACE) is a chemical redistribution program operated and maintained by the NASA Ames Research Center, Office of Safety, Health and Environmental Services, Code DQH. The ACE program promotes the use of surplus chemicals. By using the ACE, individuals/organizations will save $$ by eliminating purchase of new chemicals and eliminating disposal costs. The ACE inventory lists materials alphabetically by chemical name and shows quantities, container size, volume remaining in container, and whether the container has been opened.

Availability

Materials listed on the inventory are available to Ames resident staff and NASA installations.

Accessing the ACE Inventory

Ames resident Macintosh users can access the inventory on the ACE share folder as described on the other side.

Requesting a Chemical

(1) Scan the inventory and note which item(s) you want on Form RC - the chemical request form. (Call the ACE coordinator at ext. 4-3532 for a copy of Form RC). Once the inventory is on the WWW Ames DQH Home Page, requests can be made electronically.

(2) Send completed forms to the ACE Coordinator at M/S 19-21. Allow 3 to 5 working days for delivery (at Ames only). Non-Ames resident staff must pay for shipping to their location.

Donating a Chemical

(1) Use Form A - the Hazardous Material Pickup Request form - and check the box labeled "Reuse" under the column heading "Handling Instructions."

(2) Submit completed forms to USPCI/LAIDLAW at M/S 19-21. The items will be picked up and placed into the ACE inventory. The ACE coordinator will update the inventory according to the information submitted.

Materials to Donate

Most chemicals with the following characteristics may be donated to ACE:

- unopened containers
- original intact, sealable containers
- solid materials are pourable and not clumpy
- liquids are not solidified or do not exhibit phase separations
- liquids that should be clear are clear
- liquids do not show signs of crystallization or crusting

Questions? Contact the ACE Coordinator at extension 4-3532

ATTACHMENT G

ACE Inventory Goes On-Line

A stock of chemical materials, free for the taking, is available at Ames for any resident chemical or laboratory users who currently are using chemicals or who are considering a chemical purchase.

To find out what chemicals are available, the Ames Chemical Exchange (ACE) inventory can now be conveniently accessed electronically through a share folder. Once this has been done, users go to the location indicated and pick up the item(s) listed. Users then call Ext. 4-3532 so the inventory can be updated accordingly.

For instructions on how to access the ACE inventory, or for more general information, call Mark Lacy at Ext. 4-3532.

ATTACHMENT F

From: Administrator (3/9/95) Darryl Gaines (3/9/95) Teresa Alvarado (3/8/95)
To: Evelyn Aguon, Patricia Berritto, Ron Blaylock, Steven Brisbin, John Brodt, Scott Brown, Margaret
CC:
BCC:
Priority: Important Date sent: 3/9/95 7:51 AM

Eco-Notes

3/8/95

DQH Phone: 604-5602

FWD>>Eco-Notes: ACE Update

Update to Eco-Notes issue # 5

ATTENTION ALL RESIDENT CHEMICAL/LABORATORY USERS:

If you are or will be considering a chemical

- more -

purchase, Ames currently has a stock of chemical materials *free* for the taking. You need only check the Ames Chemical Exchange (ACE) Inventory - and you can do so without leaving your office!

The ACE Inventory can now be accessed electronically through a share folder. Just follow the simple steps below.

(1) Go into Chooser (under the Apple menu) and select AppleShare;

(2) Click on AppleTalk Zone DQ/N19;

(3) Select File Server Ames Chemical Exchange and hit "ok";

(4) Connect to the File Server as a "Guest";

(5) Select ACE as the item you want to use;

(6) Exit the Chooser - the ACE folder (with snake logo) should appear on your desktop;

(7) Click on (snake) folder on your desktop and open the file named ACE Inventory. You will need Excel 4.0 (or later version) to open. The inventory is in Read-Only format. You can trash the folder when you've finished reviewing the inventory as it gets updated frequently.

To actually get an item that is listed, either:

• Contact Mark Lacy at 4-3235 if you need access to the Central Chemical Storage Facility (CCSF); or

- more -

From: Administrator (3/9/95) Darryl Gaines (3/9/95) Teresa Alvarado (3/8/95)
To: Evelyn Aguon, Patricia Berritto, Ron Blaylock, Steven Brisbin, John Brodt, Scott Brown, Margaret
CC:
BCC:
Priority: Important Date sent: 3/9/95 7:51 AM

- Contact the chemical owners for chemicals located in laboratories to arrange for pick-up.

In either case, after getting the material please inform Mark Lacy so that he can update the inventory accordingly. Note that a standardized procedure for using the Ames Chemical Exchange is forthcoming. Until then, if you have any questions regarding the ACE, please call Mark Lacy at 604-3532.

Thanks and happy chemical swapping!

APPENDIX D

Matrix 1 - Source Reduction Evaluation

Site Name: NASA Ames Research Center		1. Change in Hazardous Waste Quantity		2. Technical Feasibility		3. Economic Feasibility		4. Effects on Product Quality		5. Effects on Employee Safety		6. Effects on Law Compliance		7. Releases and Discharges		TOTAL SCORE
Year: 1994		W=9		W=6		W=8		W=10		W=10		W=10		W=9		
CWC: 541, Calfran Sludge		S	W x S	S	W x S	S	W x S	S	W x S	S	W x S	S	W x S	S	W x S	
APPROACHES	MEASURES															
Input Changes	switch to pre-hardened film	1	9	5	30	10	80	5	50	6	60	6	60	6	54	**382**
Operational Improvements																
Production Process Changes	replace RA-4 process with digital prints	1	9	8	48	1	8	3	30	6	60	5	50	6	54	**289**
" "	limited use of digital camera	1	9	8	48	4	32	3	30	6	60	5	50	6	60	**322**
Product Reformulation																
Administrative Steps																
W = weight factor																
S = score																

Matrix 2 - Source Reduction Evaluation

Site Name: NASA Ames Research Center

Year: 1994		1. Change in Hazardous Waste Quantity W=9		2. Technical Feasibility W=6		3. Economic Feasibility W=8		4. Effects on Product Quality W=10		5. Effects on Employee Safety W=10		6. Effects on Law Compliance W=10		7. Releases and Discharges W=9		TOTAL SCORE
CWC: 352, Oil Spill Cleanup Debris		S	W x S	S	W x S	S	W x S	S	W x S	S	W x S	S	W x S	S	W x S	
APPROACHES	MEASURES															
Input Changes	change to incinerable absorbent	3	27	10	60	1	8	5	50	6	60	5	50	5	45	**335**
Operational Improvements	segregate and reuse absorbent	5	45	10	60	10	80	5	50	5	50	5	50	10	90	**475**
Production Process Changes																
Product Reformulation																
Administrative Steps																
W = weight factor																
S = score																

Matrix 3 - Source Reduction Evaluation

Site Name: NASA Ames Research Center		1. Change in Hazardous Waste Quantity		2. Technical Feasibility		3. Economic Feasibility		4. Effects on Product Quality		5. Effects on Employee Safety		6. Effects on Law Compliance		7. Releases and Discharges		TOTAL SCORE
Year: 1994		W=9		W=6		W=8		W=10		W=10		W=10		W=9		
CWC: 352, Contaminated Soil		S	W x S	S	W x S	S	W x S	S	W x S	S	W x S	S	W x S	S	W x S	
APPROACHES	MEASURES															
Input Changes																
Operational Improvements	cleaning of storm drain catch basins	1	9	10	60	8	64	8	80	5	50	5	50	8	72	430
Production Process Changes	introduce metal absorbing plants	5	45	10	60	8	64	8	80	5	50	5	50	6	54	450
Product Reformulation																
Administrative Steps																
W = weight factor																
S = score																

Matrix 4 - Source Reduction Evaluation

Site Name: NASA Ames Research Center		1. Change in Hazardous Waste Quantity		2. Technical Feasibility		3. Economic Feasibility		4. Effects on Product Quality		5. Effects on Employee Safety		6. Effects on Law Compliance		7. Releases and Discharges		TOTAL SCORE
Year: 1994		W=9		W=5		W=8		W=10		W=10		W=10		W=9		
CWC: 352, Oil w/o Halogen. Solvents		S	W x S	S	W x S	S	W x S	S	W x S	S	W x S	S	W x S	S	W x S	
APPROACHES	MEASURES															
Input Changes																
Operational Improvements																
Production Process Changes	refurbish Unitary facility	1	9	10	60	5	40	5	50	6	60	5	50	6	54	361
Product Reformulation																
Administrative Steps	reduce frequency of oil changes	1	9	1	6	6	48	1	10	5	50	5	50	5	45	242
W = weight factor																
S = score																

SOURCE REDUCTION EVALUATION REVIEW AND PLAN

SUMMARY

FOR NASA AMES RESEARCH CENTER

SEPTEMBER 1, 1995

Prepared to fulfill the requirements of Title 22 CCR Section 67100.4
promulgated under the Hazardous Waste Source Reduction and
Management Review Act of 1989
Senate Bill 14

Prepared by:

SAIC
NASA Ames Research Center
M/S 19-21
Moffett Field, CA 94035-1000

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This plan summary has been prepared pursuant to Title 22 of the California Code of Regulations Section 67100.6.

1.0 NAME AND LOCATION OF SITE

NASA-Ames Research Center (ARC)
Moffett Field, California 94035-1000

2.0 SIC CODE

All operations and activities at ARC are included in SIC code 9661 - Space Research and Technology

3.0 BRIEF OVERVIEW OF PLAN

Seven major routinely generated hazardous waste streams, which accounted for 273,000 lbs. (73%) of ARC's total 376,288 lbs. of routinely generated wastes, and two major routinely generated extremely hazardous waste streams are identified in the 1995 source reduction evaluation review and plan. These major waste steams are:

Hazardous Wastes

Calfran Sludge	CWC 541	(Waste ID 6)
Oil Spill Cleanup Debris	CWC 352	(Waste ID 11)
Oil without Halogenated Solvents	CWC 221	(Waste ID 22)
Soil, Contaminated	CWC 352	(Waste ID 7565)
Oil Contaminated Rags	CWC 352	(Waste ID 5)
JP-5 Fuel	CWC 331	(Waste ID 3153)
Labpacks	CWC 551	

Extremely Hazardous Wastes

Hydrochloric Acid Solutions	CWC 791	(Waste ID 8100)
Labpacks (laboratory chemicals)	CWC 551	

Ten of the 14 reduction measures evaluated in the plan were recommended for implementation. The estimated overall reduction to be achieved from implementing the recommended measures over the next four years is 23%.

4.0 SUMMARY OF EVALUATION FACTORS

Where two or more source reduction measures were identified for an individual waste stream, each reduction measure was evaluated against the other measure(s) based on the criteria specified in Section 67100.5(k), namely:

1) expected change in the amount of hazardous waste generated;
2) technical feasibility;
3) economic evaluation;
4) effects on product quality;
5) employee health and safety implications;
6) permits, variances, compliance schedules or applicable state local and federal agencies;
7) releases and discharges;

To simplify incorporating these criteria into the evaluation process, overall evaluations were scored quantitatively by assigning weight factors to each of the seven criterion. The weight factors for each criterion were chosen based on relative importance to the NASA mission and policy and current budget constraints.

In all cases, the reduction measure scoring the highest was recommended for implementation. In general, reduction measures that scored below 350 were not recommended for implementation, although this score was not used to determine whether or not to implement a measure. For example, in one case, the source reduction measure of using a digital camera for limited applications to reduce Calfran sludge waste was recommended even though the overall evaluation score was below 350. Use of a digital camera in limited applications was recommended in part because of its minor economic impact.

5.0 SUMMARY OF SELECTED MEASURES

Reduction measures selected for implementation in the Plan and the rationale for selecting each are summarized in this section. A listing of the selected reduction measures is shown in Table 1 at the end of this section. Each measure has been categorized as one of the following: input change, operational improvement, production process change, or administrative steps. No product reformulation measures were identified.

5.1 Input Change

The N203 Photolab developing process was the only waste generating process for which a favorable material substitution or input change was identified. This option called for replacing standard film with a pre-hardened film that eliminates the need for neutralizers and pre-hardeners in the Kodak EA-5

developing process. The only drawback to this option is the uncertainty of when the product will be available from the manufacturer.

From a cost and waste reduction standpoint, this option will have substantial savings because 1) less chemicals will be purchased, 2) less chemicals will be stored and inventoried resulting in reduced safety/compliance liability, and 3) less product sludge from the treatment of developing chemicals will require disposal.

5.2 *Operational Improvements*

Changes in operational procedures and practices that will reduce the amount of individual waste streams generated include the following options.

5.2.1 Segregate and Reuse Spill Absorbents

When possible, clay absorbents used to clean up routine oil and chemical spills will be kept on-hand and reused. Absorbents can often be used more than once before exceeding their effectiveness. Generators would need to be instructed and trained to: 1) separate cleanup debris from the absorbent material during the cleanup operation, 2) containerize each (debris and absorbent) separately and dispose of debris, 3) label containers with absorbent to preclude identification as waste. Decreased costs in absorbent purchases and disposal. Minor cost impact to train generators.

5.2.2 Periodically Clean Storm Drain Catch Basins

This option involves a scheduled cleaning of individual catch basins and inlets throughout MFA to reduce the amount of hazardous sediment waste removed from the basin by preventing contaminants from entering the collection basin during a storm event.

Plant Engineering Branch has implemented a procedure to hydro-flush and vacuum out catch basins and inlets on a yearly basis during the dry season to remove contaminated debris from the storm collection system. Although the debris removed may require disposal as hazardous waste, the amount of basin sediments contaminated is reduced. The sediments that accumulate in the basin are also disposed of annually.

5.2.3 Reuse JP-5 in Ground Support Equipment

This measure utilizes JP-5 removed from aircraft as fuel to supply the aircraft ground support equipment (AGE). Most of the AGE vehicles, approximately 40 vehicles within the Flight Support Division, are equipped to run on JP-5. The fuel consumption rate of the AGE vehicles is 200 to 400 gallons per month. In order to implement this option, a system for ensuring fuel loads

removed from aircraft tanks were clean and free of water would need to be developed. The fuel would also need to be stored in a dedicated tank.

The system would include a fuel filter to remove particulates after a water content verification using a fuel sample jar. The filtered fuel would then be stored in a clean, labeled mobile tank or bowser from which maintenance crew members could fill the AGE vehicles. When not in use, the tank would be stored in a secondary containment structure and included in the weekly inspection currently performed by the users. The increased costs for implementing a fuel reuse system, including capital costs for equipment and tank purchases and added labor costs, would be offset by the fuel disposal and purchase savings.

5.3 Production Process Changes

5.3.1 Introduce Metal Absorbing Plants into Storm Water Settling Basin

This option also targets the reduction of contaminated sediments removed from the storm water settling basin and disposed as hazardous waste. Plant Engineering Branch is considering a test project to plant a species of metal absorbing plants in the settling basin. Some plants, such as Water Hyacinth, have been shown to reduce metals suspended in the water column by absorbing micro-nutrients (e.g. metals) through the plant root system. Using the plants to remove metals from the incoming water will reduce the metals deposited in the settling basin sediments and thus reduce the amount of sediments disposed as hazardous waste.

At the time of this report, the exact plant type, cost, and hazardous waste reduction amount was not known. However, a small decrease in lead concentrations in the water may significantly reduce the quantity of hazardous sediment waste because the lead levels which contributed to the hazardous characteristic of the sediments in past years were borderline.

5.3.2 Refurbish Unitary Facility

Installation of new equipment (i.e. vacuum pumps, air compressors, etc.) as a result of refurbishing the Unitary Wind Tunnel Complex is expected to reduce the amount of waste oil generated from equipment leaks, and operations and maintenance functions.

5.3.3 Use Digital Camera for Limited Photographic Applications

The photolab recently purchased a 35 mm digital camera which uses a CCD array to acquire an image instead of film. Prior to purchasing the camera, all photographs and digital images were produced from a film negative. With the digital camera, images can be transferred electronically directly to the

printer thereby eliminating the chemicals used to develop the film and process the prints. The camera will be used to shoot some of the assignments currently using film.

There is no estimate for the amount of film the digital camera will replace, therefore the amount of waste reduced is not known. The cost of using the digital imaging on a limited basis is acceptable, while completely replacing standard film with the digital imaging process is cost prohibitive at present.

5.4 *Administrative Steps*

5.4.1 Institute a Chemical Redistribution Program

This option was implemented as a formal program, known as the Ames Chemical Exchange (ACE), in July 1995. The program promotes the use of surplus chemicals by providing a centralized inventory of available chemicals to potential laboratory users. By reusing the surplus chemicals, the Center saves disposal costs of unwanted chemicals (i.e. reduces labpack wastes) and purchase costs of new chemicals.

5.4.2 Train Generators to Segregate Out Non-Hazardous Laboratory Chemicals

Under this option, laboratory users will be trained to identify non-hazardous chemical wastes at the point of generation and to remove these from their hazardous waste pickup requests. NASA-ARC is developing an interactive multimedia training program for laboratory users that will include a module on identifying the hazard category of a waste. A Non-Hazardous Waste List will be the generators' primary reference tool for identifying non-hazardous wastes.

5.4.3 Employ a Rag Laundering Service

A rag laundry service allows for the reuse of most contaminated cloth rags thereby saving disposal costs and purchase costs of new cloth or paper wipes. Rags are typically laundered and reused 8 to 11 times before being replaced. The laundry service does not eliminate waste rags but reduces the amount of rags requiring disposal by approximately 90%. Rags soaked with solvents or contaminated with metals or asbestos cannot be laundered. The cost to launder the rags is offset by the savings in disposal and rag purchase costs.

TABLE 1

SUMMARY OF SELECTED WASTE REDUCTION MEASURES

Waste	CWC	Reduction Measure	Current Waste Quantity (lbs.)	Estimated Reduction Quantity (lbs.)
Calfran Sludge	541	switch to pre-hardened film; limited use of digital camera	76,160	5,000 no est.
Oil Spill Cleanup Debris	352	segregate and reuse absorbent	38,261	20,000
Contaminated Soil (settling basin sediments)	352	introduce metal absorbing plants in basin; cleaning of storm drain catch Basins	33,383	3,300 3,300
Oil Contaminated Rags	352	rag laundry service	32,107	18,000
Oil w/o Halogenated Solvents	221	refurbish Unitary facility	35,497	2,000
JP-5	331	fuel reuse program	20,310	16,000
Labpacks	551	chemical redistribution program; non-hazardous waste list	37,360	no est. 1,800
TOTALS			278,178	64,300
% REDUCTION				23%

6.0 SUMMARY OF REJECTED MEASURES

Measures evaluated and rejected and rationale for rejection are summarized in this section. The rejected measures fall into the following categories: input change, operational improvement, production process change, or administrative steps.

6.1 Input Change

Waste: Oil spill cleanup debris

Changing from clay absorbent to an incinerable organic absorbent to reduce the landfilling of spill cleanup debris was rejected because the cost incinerate the waste would increase the current disposal cost by $14,000 per year.

6.2 Operational Improvements

Waste: Calfran sludge

Replacing the current RA-4 film developing process with digital print technology eliminates the use of chemicals required for conventional film and print development. This measure was rejected because 1) digital imaging would increase the overall production cost by $59,460/year, and 2) digital image resolution does not currently meet requirements for aerial photographs which account for 75% of the photolab's production.

6.3 Production Process Change

Waste: Hydrochloric acid solutions

An acid distillation system called the Waste Acid Detoxification and Reclamation (WADR) process was identified to reclaim spent acids on-site for re-use. This distillation process was rejected because the system could not be implemented cost-effectively for the limited amount of waste acids generated at ARC. The manufacturer recommends a generation rate of at least 10 gallons/hour.

6.4 Administrative Step

Waste: Oil without halogenated solvents

Reducing the frequency of oil changes during routine preventative maintenance of equipment associated with the Unitary Wind Tunnel Complex was not a justifiable option. Maintaining the current oil change schedule is critical to the safe continued operation of the compressors.

7.0 ABSTRACTS OF REDUCTION MEASURES

An abstract of each reduction measure identified is given in the following pages. Abstracts contain information as required in 22 CCR 67100.6(f).

7.1 Switch to Pre-hardened Film

Quantity of waste:	76,160 lbs.	
Process generating waste:	treatment of spent photographic processing solutions	
Reduction approach:	change film used in processes (input change)	
Description of measure:	the film manufacturer (Kodak) is expected to release a new film product that would eliminate the need for using pre-hardeners and neutralizers in the film processing unit.	
Economic overview:	purchase costs avoided:	$28,965/year
	disposal costs avoided:	$6,973/year
	total annual savings:	$35,938
	cost to implement:	none
	payback period:	N/A
Estimated reduction:	5,090 lbs. (7%)	
Barriers/obstacles:	availability of product from manufacturer	
Identification of impacts:	possibly reduce air impacts reduce impacts to water no anticipated land impacts	

7.2 *Limited Use of Digital Camera*

Quantity of waste:	76,160 lbs.
Process generating waste:	treatment of spent photographic processing solutions
Reduction approach:	use digital camera to produce photographic images (production process change)
Description of measure:	A digital 35 mm camera can transfer an image directly to the printer without standard film developing chemicals. This camera may be used in a limited capacity because of cost to produce digital prints and technological limitations on the quality of digital images.
Economic overview:	purchase costs avoided: unknown disposal costs avoided: unknown total annual savings: unknown cost to implement: $10,000 payback period: unknown
Estimated reduction:	no estimate
Barriers/obstacles:	limited to non-aerial applications which accounts for 25% of the photolab's production, print production is expensive relative to standard film processing (~1000% more expensive).
Identification of impacts:	possibly reduce air impacts reduce impacts to water no anticipated land impacts

7.3 *Segregating and Reusing Absorbent*

Quantity of waste:	38,261 lbs.
Process generating waste:	routine facilities and flight operations maintenance activities
Reduction approach:	operational improvement
Description of measure:	Store used absorbent at the point of generation for subsequent reuse. The absorbent clay can be used several times prior to disposal.
Economic overview:	purchase costs avoided: $1,833 disposal costs avoided: $9,589 total annual savings: $11,422 cost to implement: negligible payback period: N/A
Estimated reduction:	20,266 lbs. (53%)
Barriers/obstacles:	modifying current practice and habits
Identification of impacts:	no significant air impacts no significant impacts to water reduce land impacts

7.4 *Introduce Metal Absorbing Plants in Settling Basin*

Quantity of waste:	33,383 lbs.
Process generating waste:	treatment of storm water through the settling basin
Reduction approach:	production process change
Description of measure:	Place specialized plants directly into the settling basin to enable uptake of heavy metals from the water. Less metals will be available for depositing into the sediment which is removed annually for disposal.
Economic overview:	purchase costs avoided: N/A disposal costs avoided: 10% of current total annual savings: 10% cost to implement: negligible payback period: N/A
Estimated reduction:	3,300 lbs. (10%)
Barriers/obstacles:	N/A
Identification of impacts:	no air impacts reduce impacts to water possibly reduce land impacts

7.5 *Cleaning of Storm Drain Catch Basins and Inlets*

Quantity of waste:	33,383 lbs.
Process generating waste:	treatment of storm water through the settling basin
Reduction approach:	operational improvement
Description of measure:	Periodically clean out catch basins to prevent heavy metals and other contaminants from accumulating and contaminating sediments in the settling basin.
Economic overview:	purchase costs avoided: N/A disposal costs avoided: 10-20% of current total annual savings: 10-20% of current cost to implement: none payback period: N/A
Estimated reduction:	3,300 lbs. (10%)
Barriers/obstacles:	N/A
Identification of impacts:	no air impacts possibly reduce impacts to water possible reduce land impacts

7.6 *Rag Laundry Service*

Quantity of waste:	32,107 lbs.
Process generating waste:	equipment maintenance and spill cleanup
Reduction approach:	administrative change
Description of measure:	Employ a rag laundry service to clean and reuse oily shop rags to replace rag disposal.
Economic overview:	purchase costs avoided: $1,140 disposal costs avoided: $14,595 total annual savings: $15,735 cost to implement: none payback period: N/A
Estimated reduction:	18,000 lbs. (89%)
Barriers/obstacles:	N/A
Identification of impacts:	no significant air impacts increase impacts to water reduce land impacts

7.7 *Refurbish Unitary Facility*

Quantity of waste:	35,497 lbs.
Process generating waste:	wind tunnel air compressor and equipment leaks and maintenance
Reduction approach:	production process change
Description of measure:	equipment replacement
Economic overview:	purchase costs avoided: N/A*
	disposal costs avoided: 6% of current
	total annual savings: 6%
	cost to implement: N/A*
	payback period: N/A

*cost impact is inconsequential because the equipment will be replaced as a result of the Unitary wind tunnel modernization project already underway

Estimated reduction:	2,000 lbs. (6%)
Barriers/obstacles:	N/A
Identification of impacts:	no significant air impacts no significant impacts to water no significant land impacts

7.8 *Reuse Jet Fuel in Aircraft Ground Equipment (AGE) Vehicles*

Quantity of waste:	20,310 lbs.	
Process generating waste:	aircraft defueling operations	
Reduction approach:	Operational Improvement	
Description of measure:	Store and reuse fuel removed from aircraft to operate aircraft ground support equipment (AGE).	
Economic overview:	purchase costs avoided:	$4,680
	disposal costs avoided:	$8,800
	total annual savings:	$11,124
	cost to implement:	$9,860
	payback period:	8 months
Estimated reduction:	16,000 lbs. (80%)	
Barriers/obstacles:	N/A	
Identification of impacts:	no significant air impacts increase impacts to water reduce land impacts	

7.9 *Implement Chemical Redistribution Program*

Quantity of waste:	37,360 lbs.	
Process generating waste:	laboratory research and development	
Reduction approach:	administrative change	
Description of measure:	A chemical redistribution program enables researchers select chemicals from a centralized inventory of surplus items prior to purchasing new chemicals.	
Economic overview:	purchase costs avoided:	$100 - $800/month (variable)
	disposal costs avoided:	<$50/month
	total annual savings:	$15,735
	cost to implement:	none
	payback period:	N/A
Estimated reduction:	no estimate	
Barriers/obstacles:	staff awareness of program	
Identification of impacts:	no significant air impacts no significant impacts to water possibly reduce land impacts	

7.10 *Implement Procedure for Source Segregation of Non-Hazardous Laboratory Chemicals*

Quantity of waste:	37,360 lbs.
Process generating waste:	laboratory research and development
Reduction approach:	administrative change
Description of measure:	Establish a written procedure that enables laboratory users to determine which waste chemicals are non-hazardous. Use of the procedure would reduce the amount of waste turned in for disposal as hazardous waste.
Economic overview:	purchase costs avoided: N/A disposal costs avoided: 5% of current total annual savings: 5% cost to implement: none payback period: N/A
Estimated reduction:	1,800 lbs. (5%)
Barriers/obstacles:	N/A
Identification of impacts:	no significant air impacts no significant impacts to water reduce land impacts

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

FOR NASA AMES RESEARCH CENTER

SEPTEMBER 1, 1995

Prepared in accordance with Title 22 CCR Section 67100.8
promulgated under the Hazardous Waste Source Reduction and
Management Review Act of 1989
Senate Bill 14

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TABLE 1 Hazardous Waste Generation Quantities for NASA ARC and Moffett Federal Airfield

APPENDIX A Hazardous Waste Management Report Table and Explanations Sheet

1.0 NAME AND LOCATION OF SITE

NASA-Ames Research Center (ARC)
Moffett Field, California 94035-1000

2.0 SIC CODE

All operations and activities at NASA-ARC are included in SIC code 9661 - Space Research and Technology

3.0 WASTE STREAM QUANTITIES GENERATED

Estimates of the hazardous waste quantities generated, including exempt, non-exempt, routine, and non-routine wastes, and the method of management for each waste at NASA Ames Research Center and Moffett Federal Airfield for reporting year 1994 and baseline year 1990 are summarized in Appendix A. Waste totals for baseline year and current year as well as percent decrease, if applicable, is also shown. Totals for each management approach are given at the bottom of each column within the current and baseline year headings. An "NA" appears in the "% Reduction" column for each waste that is specified in 1994 but not in 1990.

Overall, the waste totals for 1990 and 1994 are virtually unchanged. While the overall decrease was negligible (2%), individual wastes quantities for some wastes varied dramatically between the current and baseline years. Some of the changes are discussed in Section 5.6.

4.0 HAZARDOUS WASTE MANAGEMENT APPROACHES

The hazardous waste management approaches used by Ames are source reduction, recycling, and treatment. A description of the approaches implemented since baseline year are discussed below. Continuing waste reduction approaches are also described in the following section.

4.1 Approaches Implemented Since Baseline Year

4.1.1 Source Reduction

Project/Activity: 40' x 80' Wind Tunnel Protective Coatings Project
Approach: Containment and Reuse of Steel Grit Paint Blast Media

The 40' x 80' Wind Tunnel is undergoing a five year project, scheduled for completion December 1995, to repaint approximately 1,000,000 square feet of metal surface area. The project uses an abrasive steel grit media to remove the lead based paint from the exterior steel members and surface of the wind tunnel structure. Blasting operations are contained within a tarped area or zone approximately 15 feet deep by 30 feet wide by 120 feet tall. The containment allows for the collection of fine lead bearing paint dust using 3,600 CFM dust collectors and for the reuse of the steel grit media. Three to four 55-gallon drums of dust is collected within each zone. Since the start of the project, 50 to 60 containment zones have been set up and dismantled.

As compared to conventional sand blast media, the steel grit is reusable 50 to 100 times and is more abrasive than sand. As a result, the blast media waste is reduced dramatically. The industry standard sand requirement for sand blasting is 24 lbs./square foot of steel surface. Although steel grit is four times heavier than sand, its increased abrasiveness and ability to reuse results in a usage rate of approximately 0.5 lb./square foot of steel surface. The estimated reduction achieved over the duration of the 5 year project by containing the blasting operations and using steel grit abrasive is shown below.

Assumptions

total surface area = 1,000,000 square feet
sand usage rate = 24 lbs./square foot
steel usage rate = 0.5 lbs./square foot

Waste volume reduced = (24 lbs./sq.ft. - 0.5lbs./sq.ft.) x 1,000,000 sq.ft.
= 23.5 million lbs. over five years (or 2,350 tons/year)

Adequate containment also prevents lead dust from contaminating soils and entering the on-site storm collection system, resulting in minimized soil contamination and minimized disposal of sediments from the storm water collection basin as hazardous waste. Sediments are tested and removed from the basin for disposal annually.

4.1.2 Recycling

Project/Activity: **Model Machining and Contract Fabrication Shop**
Approach: **Metal Working Coolant Recycling**

In 1994, the Model Machining and Contract Fabrication Shop at N220 procured a coolant recycling unit to replace the micro-filtration treatment unit formerly used to filter out contaminants from spent coolant/water mixtures. The treated water was then discharged in batches manually to the sanitary sewer. The new recycling unit removes particulates and way oil from the spent coolant and collects the clean coolant into a drum for reuse in the machining equipment. The way oil and contaminant residue are accumulated and disposed as hazardous waste. Approximately 80 gallons of coolant is recycled per month.

Net Reduction = 960 gallons/year

4.1.3 Treatment

Project/Activity: **Excavation and Construction Projects**
Approach: **On-site Bioremediation of Fuel Contaminated Soils**

In 1993, the Plant Engineering Branch, Organization Code JFP, began to mitigate fuel (e.g. TPH-diesel) contaminated soils on-site using naturally occurring microbes enhanced by common composting techniques. The contaminated soils are removed and stockpiled during restoration, remediation, and construction activities involving underground storage tank removal and excavation projects. Soils that are successfully remediated are available for re-use on-site as fill material rather than shipping the contaminated soil off-site for disposal or treatment.

Initially, the operation used imported mushroom compost, but as of December 1994, JFP purchased a large chipper enabling workers to grind landscape maintenance waste into compost material. Yard waste that formerly was collected in two 40 cu yd. bins and picked up approximately twice per month by the refuse contractor is now taken to Building N267 where the larger tree and shrub parts are ground into wood chips. The wood chips and green clippings are then rotor tilled into the soil on the remediation pad once per week to maintain temperature and moisture levels.

Temperature is monitored with a continuous recording temperature probe to maintain optimum conditions for remediation.

Results of the bioremediation/composting program are as follows:

1. Composting of all landscaping waste saves approximately 160 cubic yards of landscape waste per month which accounts for approximately $25,000/year in removal costs.

2. Sampling and analysis of the soils to monitor fuel concentrations has shown a decrease in TPH levels to below the cleanup levels for re-use of the soils on-site (see below).

Sample Location	Post Compost 1* TPH-diesel (mg/kg) 8-10-94	Post Compost 2* TPH-diesel (mg/kg) 10-3-94	Reuse Cleanup Level (mg/kg)
R4-3-3	519	66	400
R4-9-3	510	85	400

*Soils are screened in the field with a PID prior to taking the soil to the remediation pad. PID readings of 100 ppm (concentration of volatile hydrocarbons in air) are roughly correlated to a soil concentration of 1,000 mg/kg (concentration of hydrocarbons in soil). Based on the PID readings, soils with petroleum contamination of 1,000 mg/kg or less are taken to the pad for treatment. At the pad, soils are sampled after subsequent periods of treatment and analyzed by a certified laboratory. "Post Compost 1" indicates the first sampling event at the pad. "Post Compost 2" indicates the second sample collected at a later date from the same location. Soils with greater than 1,000 mg/kg petroleum hydrocarbons may be considered hazardous and thus are not treated at the pad. These soils are hauled off site and disposed of appropriately.

3. As of the first quarter of 1995, approximately 3,700 cubic yards of soil have been remediated. Costs avoided by not landfilling the 3,700 cubic yards of contaminated soil is approximately $587,000, based on the following:

soil volume	3,700 cu. yds.
soil weight	1 ton/cu. yd.
bin size	40 cu. yds.
transportation	$2,000/bin
landfill disposal	$100/ton
container drop-off/pick-up fee	$275/bin
container liner fee	$60/bin

transportation cost	= 3,700 cu. yds.(1 bin/40 cu. yds.)($2,000/bin)
	= $186,000
landfill cost	= 3,700 cu. yds.(1 ton/cu. yd.)($100/ton)
	= $370,000
container drop-off/ pick-up fee	= 3,700 cu. yds. x (1 bin/40 cu. yds.)($275/bin)
	= $25,438
container liner fee	= 3,700 cu. yds. x (1 bin/40 cu. yds.)($60/bin)
	= $5,550
Total Savings	**= $586,988**
Net Reduction	**= 3,700 cu. yds. of contaminated soils**
	= 1,920 cu. yds. of landscape waste

4. The wood chips are also used in planting areas to promote water retention in soil, to enhance aesthetics, and to provide weed control thereby reducing herbicide and water use.

4.2 *Continuing Waste Reduction Approaches*

4.2.1 Recycling

A. Project/Activity: Photodevelopment laboratory
Approach: On-site Recycling of Photoprocessing Rinsewaters, Regeneration of Bleach, and electrolytic silver recovery

Pacex 15

Rinsewater from non-EA5 processes is treated through a Pacex 15 ion-exchange treatment system and recirculates back to the machines for re-use. The system holds 600 gallons. An equivalent of 387,100 gallons of rinsewater was recirculated through the system in 1994 (i.e. 387,100 gallons of water was saved). The system recycles 60% to 65% of the water used by the photolab.

Photographic bleach is regenerated and reused by converting the ferrocyanide to ferricyanide. The savings from this system are as follows:

	Mixes	Gallons
quarterly regeneration	39	2,145
yearly regeneration	156	8,580
cost of bleach per gallon	$9.31	
cost of bleach per unit	$246.75	
number of units saved per year	312	
net savings per year	**$76,986**	
net waste reduction	**8,580 gallons**	

Net Reduction = 8,580 gallons/year
Net Savings = $76,986

Electrolytic Silver Recovery

Four electrolytic recovery units are used by the photolab to remove metallic silver from developers and fixers. An average of 850 troy ounces of silver are recovered annually and returned to surplus (US Treasury). Total Revenue = 850 x $5.20/troy ounce = **$4,420**

Net Reduction = 850 troy ounces

B. Other Materials Sent Off-site for Recycling

A listing of wastes sent off-site for recycling, energy recovery, or other processing qualified to receive recycling credits is as follows:

Material	CWC	Qty. (lbs.)	Facility
ethylene glycol	133	1,917	CWMI (OSCO)
oil filters, drained	181	2,800	Evergreen Environ. Services
solder dross	181	172	ECS Refining
batteries, Ni-Cad	181	1,257	Inmetco
batteries, silver-zinc	181	185	Inmetco
freon/freon and water	211	841	CWMI (OSCO)
1,1,1-TCA	211	405	CWMI (OSCO)
ethanol	212	243	CWMI (OSCO)
paint thinner	213	5,437	CWMI (OSCO)
solvents	214	13,090	CWMI (OSCO)
oil	221	53,842	Evergreen Environ. Services
water w/oil	221	247,208	Evergreen Environ. Services
coolant, oil	223	8,840	CWMI (OSCO)
water w/fuel	241	38,000	Evergreen Environ. Services, Gibson Environmental
JP-5	331	20,310	CWMI (OSCO)
diesel fuel	331	2,295	CWMI (OSCO)
activated carbon	352	3,500	Westates Carbon
batteries, acid	352	6,531	Kinsbursky Brothers
empty tanks	512	7,950	Erickson, Inc.
empty drums	512	16,393	Container Management Services
compressed gas cylinders	513	23	Matheson Gas Co.
photographic solutions	541	4,254	Photo Waste Recycling Co.
Pace resin beads	541	800	Pace International
mercury and items containing mercury	725	402	Bethlehem Apparatus
oil w/halogenated solvents	221, 741	7,425	CWMI (OSCO)

CWMI - Chemical Waste Management, Inc.

4.2.2 Treatment

A. Project/Activity: Photodevelopment Laboratory
Approach: On-site Treatment of Photoprocessing Rinsewaters and Developing Chemicals

Rinsewaters from the Kodak EA-5 process are treated through a Pace-Scrubber ion-exchange unit and spent photochemistry (fixers, developers, pre-hardeners, neutralizers, replenishers) are treated through two Calfran treatment units. The treatment system components and savings achieved from each are described below:

<u>Calfran</u>

Spent photochemistry solutions drain through one of two distillation units which concentrates the metal and organic contaminants by evaporating the water. The water is then treated and discharged or discharged directly to the sanitary sewer, depending on contaminant levels. The concentrated waste sludge requires disposal by incineration. The system reduces the waste volume requiring disposal by 80-90%. A comparison of cost to treat on-site versus off-site disposal is shown below:

Off-Site Disposal

quantity generated/year = 39,346 gallons (1994 data) or 787 drums
disposal cost = $220/drum (assuming wastewater could be sent for stabilization)
transportation cost = $45/drum
drum cost = $25/drum
labor = 500 hrs./year x $35/hr = $17,500
total cost = $245,730

On-Site Treatment

quantity of CALFRAN sludge generated/year = 6,800 gallons or 136 drums
disposal cost = $750/drum (incineration)
transportation cost = $85/drum
drum cost = $25/drum
labor = 90 hrs./year x $35/hr = $3,150
analytical cost = $6,250 (40 samples/year)
resin media cost = 1,000/cartridge x 4 cartridges/year = $4,000
total cost = $130,360

Net Reduction (Calfran) = 39,346 gal. - 6,800 gal. = **32,546 gallons**
Net Savings (Calfran) = $245,730 - $130,360 = **$115,370**

Pace Scrubber

EA5 process rinse water is treated by an ion exchange system which removes silver and cyanide contaminants enabling the water to be discharged to the sewer. Without treatment, the rinsewater would have to be collected and shipped off-site for treatment and/or disposal. The costs savings for treating the rinsewater is shown below:

Off-Site Disposal

quantity discharged = 224,000 gallons
disposal cost = $0.95/gallon (assuming wastewater could be sent to recycler)
total cost = $212,000

On-Site Treatment

quantity discharged = 224,000 gallons
discharge cost = negligible
labor = 90 hrs/year x $35/hr = $3,150
analytical cost = $4,460 (approx. 50 samples/year)
resin media cost = $1,000/cartridge x 4 cartridges/year = $4,000
total cost = $11,610

Net Waste Reduction (Pace) = **224,000 gallons**
Net Savings (Pace) = **$200,390**

Total Net Reduction (Pace and Calfran) = 256,546 gallons
Total Net Savings (Pace and Calfran) = $315,760

B. Project/Activity: Oily Wastewater from Large Air Compressors
Approach: On-site Treatment of Oily Wastewater

Condensate contaminated with oil from the air compressors at N229A is treated through an oil separating band-filter unit to remove oil prior to discharging the water to the sanitary sewer. The unit has been permitted to treat oily wastewater on-site since the condensate has been shown to meet California hazardous waste criteria for toxicity from analytical testing. Without treatment, the oily water would have to be hauled off-site as hazardous waste. A cost comparison between treatment and disposal is given below:

On-Site Treatment

condensate quantity = 31,500 gallons/year (based on 1994 records)
spent filters disposal cost = negligible (dry filters disposed as non-hazardous)
sewer disposal cost = $1.67/1,000 gal
labor, operations and maintenance (60 hours/year) = $3,000/year

Total Cost = 31,500 gal. x ($1.67/1000 gal) + $3,000 = $3,053/year

Off-Site Disposal

Total Cost = 31,500 gal. x ($0.95/gal.) = $29,925/year

Net Reduction = 31,500 gallons/year
Net Savings = $29,925 - $3,053 = $26,872

C. Project/Activity: Annual Boiler and Chiller Blowdown
Approach: On-Site Filtration of Metal Bearing Wastewater

As part of the HVAC maintenance cycle, facilities maintenance personnel drain and clean boiler and chiller systems at least once each year to control the chemical composition of the water. The wastewater removed from the HVAC systems generally contain some trace metals in concentrations above the allowable sewer discharge limit. As a result, the water must be treated or managed off-site as hazardous waste.

To manage the wastewater cost effectively, Plant Engineering has been using a Resin Filtration Unit to treat the wastewater on-site. The unit is composed of a 75 micron pre-filter and six de-ionization columns (three cation and three anion exchange columns). Non-sewerable, non-hazardous wastewater from boilers and chillers is collected into tanks, treated through a Resin Filtration Unit to remove metal contaminants, and discharged to the sanitary sewer. Wastewater containing metal levels above the hazardous waste Soluble Threshold Limit Concentration (STLC) are not treated on site.

Without on-site treatment, non-sewerable wastewater would need to be sent off-site for treatment and disposal at a significantly higher cost. On average, an estimated 50,000 gallons/year of water is treated through the filtration unit. Spent pre-filters, resin, and sludge residue are disposed as hazardous waste.

5.0 ASSESSMENT OF CHANGES SINCE BASELINE YEAR

5.1 Paint Booth Debris (CWC 181)

In the 1990 Plan, paint booth debris from the model shop was identified as the third largest routinely generated hazardous waste stream totaling 35,760 lbs. A review of the 1990 waste stream report and manifest file shows that the total consists of 6,600 lbs. of paint booth cleanup material (11 drums) and 18 cubic yards (or 29,160 lbs. using a conversion rate of 1,620 lbs./cu. yd.) of paint booth equipment. The 18 cubic yard figure was a single shipment on July 5, 1990, of paint booth equipment and contaminated debris removed from one of the paint shops. The removal of this equipment is a one-time renovation activity and as such does not contribute to the total 1990 routinely generated waste quantity.

The purchase and use of high volume low pressure (HVLP) painting equipment was the recommended source reduction measure for reducing paint booth debris from the model shops. The 1990 plan indicated that one HVLP paint gun with a 2-gallon reservoir had already been in use in the Model Shop and that another gun or smaller paint reservoir for the existing gun should be purchased for smaller projects.

To date, NASA-ARC has five paint booths (2 booths in N211, 2 booths in N212, and 1 booth in N243). HVLP equipment is used at all locations. The paint booth waste quantity for 1994 (6,023 lbs.) is very similar to the 1990 estimate of 6,600 lbs.. Depending on how much the paint booth activity has changed since 1990, the effectiveness of the HVLP equipment in reducing the waste stream is not known. Since the number of booths in use have increased from two in 1990 to five at present, and the waste quantity is largely unchanged, then the HVLP equipment may have been effective in reducing the waste per paint booth or "per unit" quantity.

Assuming the two paint booths in use in 1990 contributed equally to the 6,600 lbs. of cleanup material generated, the "per unit" waste generation rate in 1990 was 3,300 lbs./paint booth A "per unit" waste rate for 1994 and comparison with 1990 is as follows:

paint booth cleanup material	= 6,023 lbs.
paint booths in use	= 5 booths
waste generation rate	= 6,023 lbs./5 paint booths
	= 1,205 lbs./paint booth
net reduction (per booth)	= 3,300 lbs./booth - 1,205 lbs./booth
	= 2,095 lbs./booth
	= 63% reduction

5.2 *Oil with Halogenated Solvents (CWC 221/741)*

The amount of oil contaminated with halogenated solvents that was shipped off-site for recycling decreased 89% (62,535 lbs.) from the quantity reported for 1990. Improved employee training and increased employee awareness of the importance of not mixing solvents and brake fluids with used oil has contributed significantly to the reduction. As would be expected, this decrease is accompanied by an increase (46,479 lbs.) in the amount of uncontaminated used oil shipped off-site for recycling. The overall increase in spent oil generated is approximately 16,000 lbs., 12,000 lbs. of which were generated by resident agencies.

5.3 *Gas Cylinders and Empty Containers (CWC 513)*

Approximately 21,000 lbs. of empty containers were disposed of in 1990. In 1994, the quantity shipped off-site decreased by 25% (5,109 lbs.). Since 1990, the hazardous waste management group has been segregating non-hazardous wastes (including empty containers) from hazardous wastes and limiting the amount of non-hazardous waste shipped to hazardous waste disposal facilities.

5.4 *Labpacks (CWC 551)*

The laboratory chemical or labpack waste stream has declined 37% (21,784 lbs.) since 1990. Some of the factors that may have contributed to the reduction are as follows:

- Fewer laboratories are hoarding accumulated chemicals: As researchers retire, laboratories are cleared of aged chemicals that have accumulated from years of laboratory occupation.

- Research budgets are tighter: With budgets diminishing, researchers are buying fewer new chemicals and are more inclined to locate and use another researcher's excess materials. The end result is reduced chemical wastes and purchase costs. The Ames Chemical Exchange is the primary mechanism used for redistributing excess materials.

- Improved Segregation: As in the case of the empty containers mentioned above, a small portion of the wastes picked up by the hazardous waste management group is non-hazardous. The non-hazardous waste received (e.g. protein solutions, saline solutions, agars, sugars, salts) is removed from the hazardous waste stream and disposed of in the regular trash.

- Improved Waste Tracking and Management Procedures: As mentioned in Section 5.5, many wastes that were included in labpacks in 1990 can now be identified as individual waste streams apart from labpacks. Many of the labpacked wastes are now shipped to recycling or other facilities under specific waste profiles (e.g. Ni-Cad batteries).

5.5 *Changes in Waste Tracking Method*

In 1994, ARC began tracking each waste container received from generators using a customized 4D database program. From the database, waste type, quantity, pickup location, generator organization name, and other parameters can be obtained from the database for any period of time after January 1, 1994. Waste generation/disposal data prior to 1994 is not in the database. Specific waste stream information can be retrieved from the database for 1994 that cannot be specifically determined for 1990 waste data. As a result, direct waste by waste or code by code comparisons between 1990 and 1994 are difficult because some wastes that are specified in the 1994 container file database (e.g. batteries, paints, and aerosol spray cans) are not similarly identified as discrete waste streams in 1990. Many of the wastes for which the database can provide quantities generated in 1994 are typically part of the "labpack" waste stream in 1990. Some examples are described below:

Batteries: Alkaline, Ni-Cad, mercury, and lithium batteries were generated in 1990, but shipped off under various "labpack" waste profiles for land disposal or incineration. In this case, the battery waste quantities are included in the "labpack" quantity figure. Based on the 1994 database figures, these batteries accounted for 3,211 lbs.

Photographic Solutions: Non-silver bearing photographic solutions that were shipped as "labpacks" under the shipping name "Waste Alkaline Liquid, n.o.s." included 179 gallons of developers, 34 gallons of fixers, and 19 gallons of activator solutions. As a result, a total of 232 gallons (or 1,856 lbs.) of photographic solutions are included in the 59,144 lb. quantity reported for "labpacks" in 1990.

Caustic Solutions and Cleaners: Approximately 29 gallons of sodium hydroxide solutions, 31 gallons of ammonium hydroxide solutions, 22 gallons of potassium hydroxide solutions, and 10 gallons of caustic cleaners and wax removers were disposed in "labpack" drums in 1990. The total, 92 gallons (or 1,472 lbs. using a conversion factor of 16 lbs./gallon), is included in the 1990 "labpack" quantity.

Paint Related Materials: Containers of paints and paint related materials including enamels primers, adhesives, epoxies, hardeners, and multi-part paint components ranging in size from 5-gallon to 1-quart were shipped in 55-gallon labpacks for incineration and landfill. Approximately 454 gallons (or 3,632 lbs.) of paint related materials are included in the 1990 "labpack" quantity.

5.6 *Other Changes*

Contaminated soils shipped to hazardous waste disposal facilities from site cleanup/remediation projects declined from roughly 400,000 lbs. to less than 3,500 lbs in 1994. Much of this difference is attributable to the remediation of soils on-site. In 1993, NASA-ARC began stockpiling and treating fuel contaminated soils with up to 1,000 ppm petroleum hydrocarbons (see Section 4.1.3).

Prior to 1993, soils contaminated with fuel in the hundreds to thousands parts per million (ppm) range were shipped off-site to permitted disposal facilities as non-RCRA hazardous or special wastes. Although fuel contaminated soils generally do not exhibit characteristics of hazardous waste (i.e. ignitability), these soils will not be accepted at municipal sanitary landfills.

Overall, off-site disposal has decreased 27%.

More materials and larger quantities were shipped in 1994 to recycling and recovery facilities than in 1990. Materials that were recycled in 1994 but not in 1990 include:

ethylene glycol	spent activated carbon
various batteries	solder dross
Pace ion-exchange resin	drained oil filters

Materials that have been recovered/recycled at a higher rate in 1994 include:

empty drums	JP5
photographic solutions	uncontaminated oil
water contaminated with fuel	solvents
water contaminated with oil	

The overall off-site recycling rate has increased 57% since 1990. See Appendix A for disposal and recycling comparisons of individual waste streams.

6.0 FACTORS AFFECTING HAZARDOUS WASTE QUANTITIES

In July 1994, Naval Air Station Moffett Field was officially closed and stewardship of the airfield and adjoining property was transferred to ARC. ARC now leases most of the facilities formerly occupied by the US Navy to other resident agencies (RAs). A listing of the RAs that submitted waste to NASA in 1994 is provided below.

RA Code	Description	Location(s)
1	California Air National Guard (CANG)	Hangar 3
2A	Naval Air Reserve (VP-91)	Hangar 3
2B	Naval Air Reserve (MMF-ALFA/AIMD)	Hangar 3
2C	Naval Air Reserve (VR-55)	Hangar 1
2D	Naval Air Reserve (Hazardous Materials Warehouse)	Bldg. 45
2E	Naval Air Reserve	Bldg. 6
3A	Army Reserve (12th SF)	Bldgs. 111, 50
3B	Army Reserve (ASF)	Hangar 2
4A	Army (TRW/ASG)	Hangar 2
5A	Navy Exchange	NEX Building
6A	DoD, Defense Fuel Supply Point (DFSP) Fuel Farm	Bldg. 545

The resident agencies now contribute to NASA's overall hazardous waste volume because RA hazardous waste is managed by NASA-ARC. Routinely generated hazardous wastes, not exempted under Section 67100.2(c)(2) of Title 22 California Code of Regulations, for both NASA-ARC and the RAs are summarized in Table 1. Total RA waste quantities are listed under the column heading MFA (Moffett Federal Airfield).

Since July 1, 1994, RA routinely generated hazardous waste represents approximately 15% of the total waste quantity, or 54,728 lbs. of a total 376,288 lbs. Waste generation quantity comparisons between NASA-ARC and the RAs for 1994 is as follows:

Waste	TOTAL (lbs.)	ARC (lbs.)	RAs (lbs.)	NASA %	RAs %
Total Generated (managed by CWMI* only)	566,768	438,797	127,971	77	23
Total Routinely Generated, Non-Exempt	376,288	321,560	54,728	85	15
Major (≥5% of total) Routinely Generated, Non-Exempt	273,078	244,784	28,294	90	10

*Chemical Waste Management, Inc.

7.0 CHANGES IN CWC ASSIGNMENTS

Based on a review of California Waste Codes (CWCs) assigned to wastes in the 1990 Plan and Report, some of the wastes have been assigned different codes. The codes are not being changed because of a change in the characteristics of the wastes generated, but because other codes may be applied to more accurately describe the waste.

Waste	Old CWC (1990)	New CWC (1994)
spent abrasives (sand blast and steel grit media)	172	181
water with oil	221	134
1,1,1-trichloroethane	213	211
ethylene glycol (spent coolant)	331	133

133 aqueous solution with total organic residues 10% or more
134 aqueous solution with total organic residues less than 10%
172 metal dust and machining waste
181 other inorganic solid waste
211 halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
213 hydrocarbon solvents (benzene, hexane, Stoddard, etc.)
221 waste oil and mixed oil
331 off-specification, aged, or surplus organics

TABLE 1

WASTE GENERATION QUANTITIES FOR NASA AMES RESEARCH CENTER (ARC) AND MOFFETT FEDERAL AIRFIELD (MFA) 1994									
					ARC	MFA	TOTAL		
Waste Stream	Waste No.	CWC	Waste Type	Frequency	lbs.	lbs.	lbs.	%	TOTAL BY CWC
caustic solutions/cleaners	8537	122	H	R	2,097	917	3,014	1%	3,014
electrolyte solution	1	132	H	R	4,400	0	4,400	1%	4,400
PD 680	7571	134	H	R	0	2,718	2,718	1%	2,718
batteries, Ni-Cad	8516	181	H	R	777	480	1,257	0%	
batteries, mercury	8498	181	H	R	9	904	913	0%	
batteries, alkaline	8515	181	H	R	260	536	796	0%	
batteries, lithium	9059	181	H	R	21	224	245	0%	
batteries, silver-zinc	8530	181	H	R	185	0	185	0%	3,396
1,1,1-TCA	6062	211	H	R	405	0	405	0%	
freon/freon water	28	211	H	R	648	2	650	0%	1,055
ethanol	3104	212	H	R	243	0	243	0%	243
paint thinner	3086	213	H	R	4,099	1,338	5,437	1%	5,437
paint, flammable	3087	214	H	R	3,039	4,318	7,357	2%	7,357
oil, w/o halogenated solvents	**22**	**221**	**H**	**R**	**30,540**	**4,957**	**35,497**	**9%**	
oil, hydraulic	20	221	H	R	6,269	7,193	13,462	4%	48,959
coolant, oil	none	223	H	R	8,240	600	8,840	2%	8,840
JP-5 fuel	**3153**	**331**	**H**	**R**	**5,240**	**15,070**	**20,310**	**5%**	
solvents	3102	331	H	R	10,763	2,327	13,090	3%	
diesel fuel	3012	331	H	R	895	1,400	2,295	1%	35,695
oil spill cleanup debris	**11**	**352**	**H**	**R**	**32,666**	**5,595**	**38,261**	**10%**	
oil contaminated rags	**5**	**352**	**H**	**R**	**29,435**	**2,672**	**32,107**	**9%**	
spent activated carbon	none	352	H	R	3,500	0	3,500	1%	
grease	7100	352	H	R	1,066	1,309	2,375	1%	76,243
cooling tower sludge	9071	491	H	R	840	0	840	0%	840
empty crushed containers	7	513	H	R	15,744	47	15,791	4%	
compressed gas cylinders	none	513	H	R	119	0	119	0%	15,910
Calfran sludge	**6**	**541**	**H**	**R**	**76,160**	**0**	**76,160**	**20%**	
Pace resin	7280	541	H	R	800	0	800	0%	
photographic solutions	various	541	H	R	3,914	636	4,550	1%	81,510
labpacks	**none**	**551**	**H**	**R**	**37,360**	**0**	**37,360**	**10%**	**37,360**
Calla 505	none	561	H	R	400	0	400	0%	
soil, contaminated	**7565**	**611**	**H**	**R**	**33,383**	**0**	**33,383**	**9%**	**33,383**
H=hazardous waste									
E=extremely hazardous waste									
W=non-hazardous waste									
R=routinely generated wastes									
N=non-routinely generated wastes									
X=wastes exempted by 22CCR 67100.2(c)									

TABLE 1

WASTE GENERATION QUANTITIES FOR NASA AMES RESEARCH CENTER (ARC) AND MOFFETT FEDERAL AIRFIELD (MFA) 1994									
					ARC	MFA	TOTAL		
Waste Stream	Waste No.	CWC	Waste Type	Frequency	lbs.	lbs.	lbs.	%	TOTAL BY CWC
oil, w/halogenated solvents	21	741	H	R	7,209	216	7,425	2%	
aerosol spray cans, flammable	2508	741	H	R	733	984	1,717	0%	
aerosol spray cans, non-flamm.	2000	741	H	R	101	285	386	0%	9,528
TOTALS					321,560	54,728	376,288	100%	
H=hazardous waste									
E=extremely hazardous waste									
W=non-hazardous waste									
R=routinely generated wastes									
N=non-routinely generated wastes									
X=wastes exempted by 22CCR 67100.2(c)									

TABLE 1

WASTE GENERATION QUANTITIES FOR NASA AMES RESEARCH CENTER (ARC) AND MOFFETT FEDERAL AIRFIELD (MFA) 1994									
					ARC	MFA	TOTAL		
Waste Stream	Waste No.	CWC	Waste Type	Frequency	lbs.	lbs.	lbs.	%	TOTAL BY CWC
EXTREMELY HAZARDOUS WASTES									
labpacks*	**none**	**551**	**E**	**R**	**174**	**0**	**174**	**10%**	**174**
hydrochloric acid solutions	**8100**	**791**	**E**	**R**	**1,460**	**40**	**1,500**	**90%**	**1,500**
TOTALS							1,674	100%	
*includes: sodium cyanide 2.1 lbs, calcium hypochlorite 4 lbs., sodium cacodylate 0.355 lbs., hydrofluoric acid 167 lbs., arsenic compounds 0.875 lbs.									
EXEMPT AND NON-ROUTINELY GENERATED WASTES									
ethylene glycol	7106	133	H	X	662	1,255	1,917	0%	
water contaminated w/oil	12	134	H	N	230,996	16,212	247,208	23%	
well water, clean	7210	134	W	X	2,000	0	2,000	0%	
asbestos containing material	9055	151	H	X	394,975	0	394,975	37%	
sand blast grit	none	181	H	X			230,400	21%	
steel grit abrasive	none	181	H	X	35,396	0	35,396	3%	
water w/fuel	7211	241	H	X	37,992	8	38,000	4%	
PCB oil	9070	261	E	X	4,275	0	4,275	0%	
PCB light ballasts	2	261	E	X	4,865	91	4,956	0%	
PCB capacitors	9, 10	261	E	X	460	0	460	0%	
PCB contaminated solid	9060	261	E	X	264	0	264	0%	
detergent	7073	331	W	R	234	1,963	2,197	0%	
gasoline	3044	331	H	X	780	1,315	2,095	0%	
latex paint	7076	331	W	R	1,002	746	1,748	0%	
cooling tower debris	26	352	H	R	15,000	0	15,000	1%	
lead paint solids	9054	352	H	N	65123	900	66023	6%	
batteries, lead acid	8128	352	H	X	2,896	3,635	6,531	1%	
JP5 filters	7128	352	H	X	1,750	22	1,772	0%	
oil filters, drained	7182	352	H	X	1,280	3,066	4,346	0%	
empty drums for recycling	77	512	W	R	15,155	1,238	16,393	2%	
mercury	8500	725	E	X	23	0	23	0%	
mercury filled items	8499	725	E	X	379	0	379	0%	
TOTALS					815,507	30,451	1,076,358	100%	
H=hazardous waste									
E=extremely hazardous waste									
W=non-hazardous waste									
R=routinely generated wastes									
N=non-routinely generated wastes									
X=wastes exempted by 22CCR 67100.2(c)									

APPENDIX A

				BASELINE YEAR, 1990 (lbs.)								CURRENT YEAR, 1994 (lbs.)							
Waste	Explanations	Ames Waste ID Nos.	CWC	onsite recycling	onsite treatment	onsite disposal	discharge to POTW	offsite recycling	offsite treatment	offsite disposal	air emissions	onsite recycling	onsite treatment	onsite disposal	discharge to POTW	offsite recycling	offsite treatment	offsite disposal	air emissions
caustic solutions, cleaners	10	8528, 8537	122														3,014		
steam cleaner		none	122							445									
electrolyte solution		1	132							11,680							4,400		
ethylene glycol		7106	133							1,600						1,917			
hangar wash		none	134							7,480									
PD 680	13	7571	134						NG								2,718		
waste water		none	134							3,960									
water w/oil	7	12	134		208,000			117,544					252,000			247,208			
aluminum sulfate		none	141							400									
asbestos containing material	3, 19	9055	151							356,030								394,975	
metal shavings		none	172							1,600									
batteries, acid	10	8128	181													6,531			
batteries, alkaline	10	8515	181															796	
batteries, lithium	10	9059	181														245		
batteries, mercury	10	8498	181													913			
batteries, Ni-Cad	10	8516	181													1,257			
batteries, silver-zinc	10	8530	181													185			
fire extinguish. chemical		none	181							400									
oil filters, drained, uncrushed	10	7182	181													2,800		4,346	
lead paint solids/cleanup debris		9054	181							6600								6,023	
paint booth and equipment	19	none	181							29,160								60,000	
soda ash		none	181							400									
solder dross		none	181													172			

				BASELINE YEAR, 1990 (lbs.)								CURRENT YEAR, 1994 (lbs.)							
Waste	Explanations	Ames Waste ID Nos.	CWC	onsite recycling	onsite treatment	onsite disposal	discharge to POTW	offsite recycling	offsite treatment	offsite disposal	air emissions	onsite recycling	onsite treatment	onsite disposal	discharge to POTW	offsite recycling	offsite treatment	offsite disposal	air emissions
abrasive grit	8, 11, 19	none	181							33,000								276,100	
1,1,1-TCA		6062	211					440								405			
freon/freon water		28	211					880								650			
ethanol		3104	212					440								243			
paint thinner		3086	213					440								5,437			
solvents	16	3102	214					4,720	2,570							13,090			
paint, flammable	10	3087	214														7,357		
oil	2, 15	21, 22	221					2,480								48,959			
oil w/halogenated solvents	15	21	221/ 741					69,960								7,425			
coolant, oil	7	none	223					13,040								8,840			
water w/fuel	7	7211	241					22,320		13,680						38,000			
PCB ballasts	19	2	261							3,200								4,956	
PCB contaminated solids	19	9060	261							155,920								264	
PCB oil	19	9069, 9070	261							87,841							4,275		
PCB transformers	1	none	261							39,349								11,045	
PCB capacitors	19	9, 10	261							2,000								469	
phenolic resin		none	272							400									
diesel fuel	2	3012	331													2,295			
Dow Corning 200		none	331					440											
JP-5	2, 17	3153	331					680								20,310			
cooling tower debris	19	26	352							NG								15,000	

				BASELINE YEAR, 1990 (lbs.)								CURRENT YEAR, 1994 (lbs.)							
Waste	Explanations	Ames Waste ID Nos.	CWC	onsite recycling	onsite treatment	onsite disposal	discharge to POTW	offsite recycling	offsite treatment	offsite disposal	air emissions	onsite recycling	onsite treatment	onsite disposal	discharge to POTW	offsite recycling	offsite treatment	offsite disposal	air emissions
oil contaminated rags	14	5	352							8,900								32,107	
spent activated carbon	18	none	352					NG								3,500			
spill cleanup debris	14	11	352							15,200								38,261	
cooling tower sludge		9071	491							1,200								840	
vault sludge		none	491							2,440									
empty drums	5	77	512					16,544								22,490			
empty tanks		none	512					32,250								7,950			
compressed gas cylinders		none	513							200						80	39		
empty containers		7	513							20,900								15,791	
Calfran sludge	6, 12	6	541						NG								76,160		
Pace resin w/silver	12	7280	541						NG							800			
photographic solutions	7, 20	var.	541					2,680		445						4,550			
labpacks		none	551						59,144								37,360		
Oakite 61N		none	561							400									
spent Oakite		none	561							445									
Calla 505		none	561							400							400		
soil, contaminated	8, 18	7565	611							393,000								33,383	
mercury and mercury contaminated material		none	725					300		4,550						402			
aerosol spray cans	10	2508, 2000	741														2,103		
hydrochloric acid solutions	9	8100	791						1,020								1,500		
TOTALS				**0**	**208,000**	**0**	**0**	**285,158**	**62,734**	**1,203,225**	**0**	**0**	**252,000**	**0**	**0**	**446,409**	**139,571**	**894,356**	**0**

Waste	Explanations	Ames Waste ID Nos.	CWC	1990 (BASELINE) TOTALS	1994 (CURRENT) TOTALS	NET REDUCTION SINCE 1990	% REDUCTION	1990 CWC TOTALS	1994 CWC TOTALS	% REDUCTION BY CWC
caustic solutions, cleaners	10	8528, 8537	122	0	3,014	NA	NA			
steam cleaner		none	122	445	0	445	100%	445	3,014	NA
electrolyte solution		1	132	11,680	4,400	7,280	62%	11,680	4,400	62%
ethylene glycol		7106	133	1,600	1,917	NR	NR	1,600	1,917	NR
hangar wash		none	134	7,480	0	7,480	100%			
PD 680	13	7571	134	0	2,718	NA	NA			
waste water		none	134	3,960	0	3,960	100%			
water w/oil	7	12	134	325,544	499,208	NR	NR	336,984	501,926	NR
aluminum sulfate		none	141	400	0	400	100%	400	0	100%
asbestos containing material	3, 19	9055	151	356,030	394,975	NR	NR	356,030	394,975	NR
metal shavings		none	172	1,600	0	1,600	100%	1,600	0	100%
batteries, acid	10	8128	181	NA	6,531	NA	NA			
batteries, alkaline	10	8515	181	NA	796	NA	NA			
batteries, lithium	10	9059	181	NA	245	NA	NA			
batteries, mercury	10	8498	181	NA	913	NA	NA			
batteries, Ni-Cad	10	8516	181	NA	1,257	NA	NA			
batteries, silver-zinc	10	8530	181	NA	185	NA	NA			
fire extinguish. chemical		none	181	400	0	400	100%			
oil filters, drained, uncrushed	10	7182	181	0	7,146	NA	NA			
lead paint solids/cleanup debris		9054	181	6,600	6,023	577	NA			
paint booth and equipment	19	none	181	29,160	60,000	NR	NR			
soda ash		none	181	400	0	400	100%			
solder dross		none	181	0	172	NA	NA			

Waste	Explanations	Ames Waste ID Nos.	CWC	1990 (BASELINE) TOTALS	1994 (CURRENT) TOTALS	NET REDUCTION SINCE 1990	% REDUCTION	1990 CWC TOTALS	1994 CWC TOTALS	% REDUCTION BY CWC
abrasive grit	8, 11, 19	none	181	33,000	276,100	NR	NR	69,560	359,368	NR
1,1,1-TCA		6062	211	440	405	35	8%			
freon/freon water		28	211	880	650	230	26%	1,320	1,055	20%
ethanol		3104	212	440	243	197	45%	440	243	45%
paint thinner		3086	213	440	5,437	NR	NR	440	5,437	NR
solvents	16	3102	214	7,290	13,090	NR	NR			
paint, flammable	10	3087	214	0	7,357	NA	NA	7,290	20,447	NA
oil	2, 15	21, 22	221	2,480	48,959	NR	NR			
oil w/halogenated solvents	15	21	221/ 741	69,960	7,425	16,056	23%	72,440	56,384	22%
coolant, oil	7	none	223	13,040	8,840	4,200	32%	13,040	8,840	32%
water w/fuel	7	7211	241	36,000	38,000	NR	NR	36,000	38,000	NR
PCB ballasts	19	2	261	3,200	4,956	NR	NR			
PCB contaminated solids	19	9060	261	155,920	264	155,656	100%			
PCB oil	19	9069, 9070	261	87,841	4,275	83,566	95%			
PCB transformers	1	none	261	39,349	11,045	28,304	72%			
PCB capacitors	19	9, 10	261	2,000	469	1,531	77%	288,310	21,009	93%
phenolic resin		none	272	400	0	400	100%	400	0	100%
diesel fuel	2	3012	331	0	2,295	NA	NA			
Dow Corning 200		none	331	440	0	440	100%			
JP-5	2, 17	3153	331	680	20,310	NR	NR	1,120	22,605	NR
cooling tower debris	19	26	352	0	15,000	NA	NA			

Waste	Explanations	Ames Waste ID Nos.	CWC	1990 (BASELINE) TOTALS	1994 (CURRENT) TOTALS	NET REDUCTION SINCE 1990	% REDUCTION	1990 CWC TOTALS	1994 CWC TOTALS	% REDUCTION BY CWC
oil contaminated rags	14	5	352	8,900	32,107	NR	NR			
spent activated carbon	18	none	352	0	3,500	NA	NA			
spill cleanup debris	14	11	352	15,200	38,261	NR	NR	24,100	88,868	NR
cooling tower sludge		9071	491	1,200	840	360	30%			
vault sludge		none	491	2,440	0	2,440	100%	3,640	840	77%
empty drums	5	77	512	16,544	22,490	NR	NR			
empty tanks		none	512	32,250	7,950	24,300	75%	48,794	30,440	38%
compressed gas cylinders		none	513	200	119	81	41%			
empty containers		7	513	20,900	15,791	5,109	24%	21,100	15,910	25%
Calfran sludge	6, 12	6	541	NA	76,160	NA	NA			
Pace resin w/silver	12	7280	541	NA	800	NA	NA			
photographic solutions	7, 20	var.	541	3,125	4,550	NR	NR	3,125	81,510	NR
labpacks		none	551	59,144	37,360	21,784	NA	59,144	37,360	37%
Oakite 61N		none	561	400	0	400	100%			
spent Oakite		none	561	445	0	445	100%			
Calla 505		none	561	400	400	0	0%	1,245	400	68%
soil, contaminated	8, 18	7565	611	393,000	33,383	359,617	92%	393,000	33,383	92%
mercury and mercury contaminated material		none	725	4,850	402	4,448	92%	4,850	402	92%
aerosol spray cans	10	2508, 2000	741	NA	2,103	N/A	N/A			N/A
hydrochloric acid solutions	9	8100	791	1,020	1,500	NR	NR	1,020	1,500	NR
TOTALS				1,759,117	1,732,336	26,781	2%			

EXPLANATIONS SHEET
TO
HAZARDOUS WASTE MANAGEMENT TABLE

1	converted to pounds using 2.205 lbs./kg.
2	converted to pounds using 7.5 lbs./gallon
3	converted to pounds using an average weight of 1,032 lbs./cubic yard
4	converted to pounds using 7 lbs./gallon
5	converted to pounds using 44 lbs./drum
6	converted to pounds using 11.2 lbs./gallon
7	converted to pounds using 8 lbs./gallon
8	converted to pounds using 1,500 lbs./cubic yard
9	converted to pounds using 12 lbs./gallon. 85 gallons of hydrochloric acid solutions were disposed of in 1990. The 1990 figure of 680 lbs. has been revised to reflect the conversion rate of 12 lbs./gallon to be consistent with the 1994 figure.
10	In 1990, these wastes were included in the "labpack" waste stream and were not identified as discrete wastes. See explanation in Section 5.5.
11	Increase due to large abatement/repainting project, "40 ft. x 80 ft. Protective Coatings Project," that started in May 1990. See Section 4.1.1.
12	The first Calfran Unit (PTU-50) was installed Feb. 14, 1991. The Pace Scrubber was installed in June 1990. No Calfran product sludge was generated prior to installation and no Pace resin was disposed of in 1990.
13	PD 680 is a mineral spirit based degreaser used by the Naval Air Reserves and California Air National Guard. Prior to 1994, NASA-ARC did not generate this waste. The US Navy is phasing out use of PD 680 for replacement with an environmentally preferable product.
14	Increase in oily rags and spill cleanup material is attributable to several factors: a) more generators are aware of proper disposal practices for contaminated materials in 1994 than in 1990 (i.e. contaminated wastes are not thrown in the regular trash), b) resident agencies contributed to the increase, 13% to oily rags and 24% to spill cleanup.
15	The quantity of solvent contaminated oil has decreased 89% since 1990. Conversely, the uncontaminated oil quantity has increased. See Section 5.2. The overall oil waste has decreased 22%.
16	40% of the 5,800 lb. increase in solvent waste was generated by resident agencies.
17	70% of the 21,485 lb. increase in JP5 waste was generated by resident agencies.
18	Waste stream is result of remedial activity.
19	Waste stream is result of demolition/renovation of facilities.
20	A total of 232 gallons of photographic developers, fixers, and activator solutions were disposed of in "labpack" drums in addition to the figures shown in the table. The weight associated with these solutions is included in the "labpacks" waste quantity. See Section 5.5.
NA	Not applicable - no comparison can be made because the waste stream was not identified or generated in baseline year (1990)
NG	Waste not generated in 1990.
NR	No reduction.

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

SUMMARY

FOR NASA AMES RESEARCH CENTER

SEPTEMBER 1, 1995

Prepared in accordance with Title 22 CCR Section 67100.8
promulgated under the Hazardous Waste Source Reduction and
Management Review Act of 1989
Senate Bill 14

Prepared by:

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TABLE 1 Hazardous Waste Generation Quantities for NASA ARC and Moffett Federal Airfield

APPENDIX A Hazardous Waste Management Report Table and Explanations Sheet

1.0 NAME AND LOCATION OF SITE

NASA-Ames Research Center (ARC)
Moffett Field, California 94035-1000

2.0 SIC CODE

All operations and activities at NASA-ARC are included in SIC code 9661 - Space Research and Technology

3.0 SUMMARY OF HAZARDOUS WASTE MANAGEMENT APPROACHES

The hazardous waste management approaches used by Ames are source reduction, recycling, and treatment. Estimates of the hazardous waste quantities generated, including exempt, non-exempt, routine, and non-routine wastes, and the management approach for each waste for reporting year 1994 and baseline year 1990 are summarized in the table in Appendix A. Waste totals for baseline year and current year as well as percent decrease, if applicable, is also shown.

Abstracts of the approaches implemented since baseline year as well as continuing approaches are summarized in the following sections.

4.0 ABSTRACTS OF APPROACHES IMPLEMENTED SINCE BASELINE YEAR

4.1 Source Reduction

Project/Activity: 40' x 80' Wind Tunnel Protective Coatings Project

Approach: Containment and Reuse of Steel Grit Paint Blast Media

Description: The 40' x 80' Wind Tunnel 5-year repainting project uses an abrasive steel grit media to remove the lead based paint from the wind tunnel structure. The media is contained and collected for the reuse. As compared to conventional sand blast media, the steel grit is reusable 50 to 100 times.

Waste Reduction: 23.5 million lbs. over five years (or 2,350 tons/year)

<u>Assumptions</u>

total surface area = 1,000,000 square feet
sand usage rate = 24 lbs./square foot
steel usage rate = 0.5 lbs./square foot

4.2 *Recycling*

Project/Activity: Model Machining and Contract Fabrication Shop

Approach: Metal Working Coolant Recycling

Description: The Model Machining and Contract Fabrication Shop at N220 uses a coolant recycling unit to remove particulates and way oil from spent coolant and collect the clean coolant into a drum for reuse in the machining equipment. The way oil and contaminant residue are accumulated and disposed as hazardous waste. Approximately 80 gallons of coolant is recycled per month.

Waste Reduction: 960 gallons/year

4.3 *Treatment*

Project/Activity: Excavation and Construction Projects

Approach: On-site Bioremediation of Fuel Contaminated Soils

Description: The Plant Engineering Branch, Organization Code JFP, began to mitigate fuel (e.g. TPH-diesel) contaminated soils from excavation projects on-site using naturally occurring microbes enhanced by common composting techniques. Soils that are successfully remediated are available for re-use on-site as fill material rather than shipping the contaminated soil off-site for disposal or treatment.

In December 1994, JFP purchased a large chipper enabling workers to grind landscape maintenance waste into compost material. The yard waste is mixed in with the contaminated soils to enhance bioremediation.

Soil monitoring has shown a decrease in TPH levels to below the cleanup levels for on-site re-use (see following table).

Post Compost 1* TPH-diesel (mg/kg) 8-10-94	Post Compost 2* TPH-diesel (mg/kg) 10-3-94	Reuse Cleanup Level (mg/kg)
519	66	400
510	85	400

*At the pad, soils are sampled after subsequent periods of treatment and analyzed by a certified laboratory. "Post Compost 1" indicates the first sampling event at the pad. "Post Compost 2" indicates the second sample collected at a later date from the same location. Soils with greater than 1,000 mg/kg petroleum hydrocarbons may be considered hazardous and thus are not treated at the pad.

Waste Reduction: 3,700 cu. yds. of contaminated soils and $587,000 in disposal costs.

Assumptions

soil volume	3,700 cu. yds.
soil weight	1 ton/cu. yd.
bin size	40 cu. yds.
transportation	$2,000/bin
landfill disposal	$100/ton
container drop-off/pick-up fee	$275/bin
container liner fee	$60/bin

5.0 ABSTRACTS OF CONTINUING APPROACHES

5.1 Recycling

Project/Activity: N203 Photodevelopment laboratory

Approach: On-site Recycling of Photoprocessing Rinsewaters, Regeneration of Bleach, and electrolytic silver recovery.

Description: Photodevelopment rinsewater from is treated through a Pacex 15 ion-exchange treatment system and continuously recirculates back to the machines for re-use. The system holds 600 gallons. An equivalent of rinsewater was recirculated through the system in 1994 (i.e. 387,100 gallons of water was saved)..

Photographic bleach is regenerated and reused by converting the ferrocyanide to ferricyanide. Bleach regeneration saves $76,986 in material purchase costs.

The photolab also uses four electrolytic recovery units to remove metallic silver (flake) from developers and fixers.

Waste Reduction: Photographic rinsewaters: 387,100 gallons/year. The system recycles 60% to 65% of the water used by the photolab.
Photographic bleach fix: 8,580 gallons/year and.
Silver: an average of 850 troy ounces of silver are recovered annually.

Project/Activity: Management of Hazardous Wastes

Approach: Off-site Recycling

Description: A listing of wastes sent off-site for recycling, energy recovery, or other processing qualified to receive recycling credits is as follows:

Material	CWC	Qty. (lbs.)	Facility
ethylene glycol	133	1,917	CWMI (OSCO)
oil filters, drained	181	2,800	Evergreen Environ. Services
solder dross	181	172	ECS Refining
batteries, Ni-Cad	181	1,257	Inmetco
batteries, silver-zinc	181	185	Inmetco
freon/freon and water	211	841	CWMI (OSCO)
1,1,1-TCA	211	405	CWMI (OSCO)
ethanol	212	243	CWMI (OSCO)
paint thinner	213	5,437	CWMI (OSCO)
solvents	214	13,090	CWMI (OSCO)
oil	221	53,842	Evergreen Environ. Services
water w/oil	221	247,208	Evergreen Environ. Services
coolant, oil	223	8,840	CWMI (OSCO)
water w/fuel	241	38,000	Evergreen Environ. Services, Gibson Environmental
JP-5	331	20,310	CWMI (OSCO)
diesel fuel	331	2,295	CWMI (OSCO)
activated carbon	352	3,500	Westates Carbon
batteries, acid	352	6,531	Kinsbursky Brothers
empty tanks	512	7,950	Erickson, Inc.
empty drums	512	16,393	Container Management Services
compressed gas cylinders	513	23	Matheson Gas Co.
photographic solutions	541	4,254	Photo Waste Recycling Co.
Pace resin beads	541	800	Pace International
mercury and items containing mercury	725	402	Bethlehem Apparatus
oil w/halogenated solvents	221, 741	7,425	CWMI (OSCO)

CWMI - Chemical Waste Management, Inc.

5.2 *Treatment*

Project/Activity: Photodevelopment Laboratory

Approach: On-site Treatment of Photoprocessing Rinsewaters and Developing Chemicals

Description: FeCN Scrubber

Rinsewaters from the Kodak EA-5 process are treated through an FeCN scrubber ion-exchange unit and spent photochemistry (de-silvered fixers, developers, pre-hardeners, neutralizers, replenishers) is treated through two Calfran evaporation units. The savings achieved from each are described below:

Calfran

Spent photochemistry solutions drain through one of two distillation units which concentrates the metal and organic contaminants by evaporating the water. The water is then treated and discharged or discharged directly to the sanitary sewer, depending on contaminant levels. The concentrated waste sludge requires disposal by incineration. The system reduces the waste volume requiring off-site disposal by 80-90%.

FeCN Scrubber

EA5 process rinse water is treated by an ion exchange system which removes silver and cyanide contaminants enabling the water to be discharged to the sewer. Without treatment, the rinsewater would have to be collected and shipped off-site for treatment and/or disposal.

Waste Reduction: Calfran: 32,546 gallons and $115,370
FeCN Scrubber: 224,000 gallons and $200,390

Calfran Assumptions

Off-Site Disposal

quantity generated/year = 39,346 gallons (1994 data)
disposal cost = $220/drum
wastewater is be sent for stabilization
transportation cost = $45/drum
drum cost = $25/drum
labor = 500 hrs./year x $35/hr = $17,500
total cost = $245,730

On-Site Treatment

quantity of sludge generated/year = 6,800 gallons
disposal cost = $750/drum (incineration)
transportation cost = $85/drum
drum cost = $25/drum
labor = 90 hrs./year x $35/hr = $3,150
analytical cost = $6,250 (40 samples/year)
resin media cost = 1,000/cartridge x 4 cartridges/year = $4,000
total cost = $130,360

FeCN Scrubber Assumptions

Off-Site Disposal

quantity discharged = 224,000 gallons
disposal cost = $0.95/gallon (assuming wastewater could be sent to recycler)
total cost = $212,000

On-Site Treatment

quantity discharged = 224,000 gallons
discharge cost = negligible
labor = 90 hrs/year x $35/hr = $3,150
analytical cost = $4,460 (approx. 50 samples/year)
resin media cost = $1,000/cartridge x 4 cartridges/year = $4,000
total cost = $11,610

Project/Activity: Oily Wastewater from Large Air Compressors

Approach: On-site Treatment of Oily Wastewater

Description: Condensate contaminated with oil from the air compressors at N229A is treated through an oil separating band-filter unit to remove oil prior to discharging the water to the sanitary sewer. The unit has been permitted to treat oily wastewater on-site since the condensate has been shown to meet California hazardous waste criteria for toxicity from analytical testing. Without treatment, the oily water would have to be hauled off-site as hazardous waste.

Waste Reduction: 31,500 gallons/year and $26,872

<u>Assumptions</u>

On-Site Treatment

condensate quantity = 31,500 gallons/year (1994)
spent filters disposal cost = negligible (dry filters disposed as non-hazardous)
sewer disposal cost = $1.67/1,000 gal
labor, O&M (60 hours/year) = $3,000/year
Total Cost = 31,500 gal. x ($1.67/1000 gal) + $3,000 = $3,053/year

Off-Site Disposal

Total Cost = 31,500 gal. x ($0.95/gal.) = $29,925/year

Project/Activity: Annual Boiler and Chiller Blowdown

Approach: On-Site Filtration of Metal Bearing Wastewater

Description: Plant Engineering personnel drain and clean boiler and chiller systems at least once each year to control the chemical composition of the water. The wastewater removed from the HVAC systems generally contain some trace metals in concentrations above the allowable sewer discharge limit. As a result, the water must be treated or managed off-site as hazardous waste.

To manage the wastewater cost effectively, Plant Engineering has been using a Resin Filtration Unit to treat the wastewater on-site. The unit is composed of a pre-filter and six de-ionization columns (three cation and three anion exchange columns). Non-sewerable, non-hazardous wastewater from boilers and chillers is collected into tanks, treated through a Resin Filtration Unit to remove metal contaminants, and discharged to the sanitary sewer.

Waste Reduction: An estimated 50,000 gallons/year of water is treated through the filtration unit.

6.0 ASSESSMENT OF CHANGES SINCE BASELINE YEAR

The following sections describe the changes in wastestreams identified for reduction in the 1990 Plan and the factors which have affected the waste quantities produced in 1994.

6.1 Paint Booth Debris (CWC 181)

In the 1990 Plan, paint booth debris from the model shop was identified as the third largest routinely generated hazardous waste stream totaling 35,760 lbs. A review of the 1990 waste stream report and manifest file shows that the majority of the waste quantity was from a one-time renovation project. The total consists of 6,600 lbs. of paint booth cleanup material (11 drums) and 18 cubic yards (or 29,160 lbs. using a conversion rate of 1,620 lbs./cu. yd.) of paint booth equipment. The 18 cubic yard figure was a single shipment on July 5, 1990, of paint booth equipment and contaminated debris removed from one of the paint shops. As such, this waste stream does not contribute to the total 1990 routinely generated waste quantity.

The 1990 plan indicated that one high volume low pressure (HVLP) paint gun with a 2-gallon reservoir had already been in use in the Model Shop and that another gun or smaller paint reservoir for the existing gun was recommended for purchase for smaller projects.

To date, NASA-ARC has five paint booths with HVLP equipment: 2 booths in N211, 2 booths in N212, and 1 booth in N243. The paint booth waste quantity for 1994 (6,023 lbs.) is very similar to the 1990 estimate of 6,600 lbs.. The effectiveness of the HVLP equipment in reducing the waste stream is not known. Since the number of booths in use have increased from two in 1990 to five at present, and the waste quantity is largely unchanged, then the HVLP equipment may have been effective in reducing the waste per paint booth or "per unit" quantity.

Assuming the two paint booths in use in 1990 contributed equally to the 6,600 lbs. of cleanup material generated, the "per unit" waste generation rate in 1990 was 3,300 lbs./paint booth A "per unit" waste rate comparison for 1994 and 1990 is as follows:

paint booth cleanup material	= 6,023 lbs.
paint booths in use	= 5 booths
waste generation rate	= 6,023 lbs./5 paint booths
	= 1,205 lbs./paint booth
net reduction (per booth)	= 3,300 lbs./booth - 1,205 lbs./booth
	= 2,095 lbs./booth
	= 63% reduction

6.2 *Oil with Halogenated Solvents (CWC 221/741)*

The amount of oil contaminated with halogenated solvents that was shipped off-site for recycling decreased 89% (62,535 lbs.) from the quantity reported for 1990. Improved employee training and increased employee awareness of the importance of not mixing solvents and brake fluids with used oil has contributed significantly to the reduction. As would be expected, this decrease is accompanied by an increase (46,479 lbs.) in the amount of uncontaminated used oil shipped off-site for recycling. The overall increase in spent oil generated is approximately 16,000 lbs., 12,000 lbs. (75%) of which were generated by resident agencies.

6.3 *Gas Cylinders and Empty Containers (CWC 513)*

Approximately 21,000 lbs. of empty containers were disposed of in 1990. In 1994, the quantity shipped off-site decreased by 25% (5,109 lbs.). Since 1990, the hazardous waste management group has been segregating non-hazardous wastes (including empty containers) from hazardous wastes and limiting the amount of non-hazardous waste shipped to hazardous waste disposal facilities.

6.4 *Labpacks (CWC 551)*

Factors that may have contributed 37% (21,784 lbs.) reduction in labpack wastes since 1990 are as follows:

- Fewer laboratories are hoarding accumulated chemicals: As researchers retire, laboratories are cleared of aged chemicals that have accumulated from years of laboratory occupation.

- Research budgets are tighter: Researchers are buying fewer new chemicals and are more inclined to locate and use another researcher's excess materials. The result is reduced chemical wastes and purchase costs.

- Improved Segregation: The non-hazardous wastes received for disposal (e.g. protein solutions, saline solutions, agars, sugars, salts) are removed from the hazardous waste stream and disposed of in the regular trash.

- Improved Waste Tracking and Management Procedures: Many wastes that were included in labpacks in 1990 can now be identified as individual waste streams apart from labpacks. Many of the labpacked wastes are now shipped to recycling or other facilities under specific waste profiles (e.g. Ni-Cad batteries).

6.5 *Changes in Waste Tracking Method*

In 1994, ARC began tracking each waste container received from generators using a customized 4D database program. From the database, waste type, quantity, pickup location, generator organization name, and other parameters can be obtained from the database for any period of time after January 1, 1994. Waste generation/disposal data prior to 1994 is not in the database. Specific waste stream information can be retrieved from the database for 1994 that cannot be specifically determined for 1990 waste data. As a result, direct waste by waste or code by code comparisons between 1990 and 1994 are difficult because some wastes that are specified in the 1994 container file database (e.g. batteries, paints, and aerosol spray cans) are not similarly identified as discrete waste streams in 1990. Many of the wastes for which the database can provide quantities generated in 1994 were typically included in the "labpack" waste stream in 1990. Some examples are described below:

Batteries: Alkaline, Ni-Cad, mercury, and lithium batteries were generated in 1990, but shipped off under various "labpack" waste profiles for land disposal or incineration.

Photographic Solutions: Non-silver bearing photographic solutions that were shipped as "labpacks" under the shipping name "Waste Alkaline Liquid, n.o.s." included 179 gallons of developers, 34 gallons of fixers, and 19 gallons of activator solutions. As a result, a total of 232 gallons (or 1,856 lbs.) of photographic solutions are included in the 59,144 lb. quantity reported for "labpacks" in 1990.

Caustic Solutions and Cleaners: Approximately 29 gallons of sodium hydroxide solutions, 31 gallons of ammonium hydroxide solutions, 22 gallons of potassium hydroxide solutions, and 10 gallons of caustic cleaners and wax removers were disposed in "labpack" drums in 1990. The total, 92 gallons (or 1,472 lbs. using a conversion factor of 16 lbs./gallon), is included in the 1990 "labpack" quantity.

Paint Related Materials: Containers of paints and paint related materials including enamels primers, adhesives, epoxies, hardeners, and multi-part paint components ranging in size from 5-gallon to 1-quart were shipped in 55-gallon labpacks for incineration and landfill. Approximately 454 gallons (or 3,632 lbs.) of paint related materials are included in the 1990 "labpack" quantity.

6.6 *Other Changes*

Contaminated soils shipped to hazardous waste disposal facilities from site cleanup/remediation projects declined from roughly 400,000 lbs. to less than 3,500 lbs in 1994. Much of this difference is attributable to the remediation of soils on-site which began in 1993.

Overall, off-site disposal in 1994 has decreased 27% since the baseline year.

More materials and larger quantities of materials were shipped to recycling and recovery facilities in 1994 than in 1990. Materials that were recycled in 1994 but not in 1990 include ethylene glycol, spent activated carbon, various batteries, solder dross, ion-exchange resin, and drained oil filters.

Materials that have been recovered/recycled at a higher rate in 1994 include empty drums, JP5, photographic solutions, uncontaminated oil, water contaminated with fuel, solvents, and water contaminated with oil.

The overall off-site recycling rate has increased 57% since 1990. See Appendix A for disposal and recycling comparisons of individual waste streams.

6.7 *Changes in CWC Assignments*

Based on a review of California Waste Codes (CWCs) assigned to wastes in the 1990 Plan and Report, some of the wastes have been assigned different codes. The codes are not being changed because of a change in the characteristics of the wastes generated, but because other codes may be applied to more accurately describe the waste.

Waste	Old CWC (1990)	New CWC (1994)
spent abrasives (sand blast and steel grit media)	172	181
water with oil	221	134
1,1,1-trichloroethane	213	211
ethylene glycol (spent coolant)	331	133

133 aqueous solution with total organic residues 10% or more
134 aqueous solution with total organic residues less than 10%
172 metal dust and machining waste
181 other inorganic solid waste
211 halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
213 hydrocarbon solvents (benzene, hexane, Stoddard, etc.)
221 waste oil and mixed oil
331 off-specification, aged, or surplus organics

7.0 FACTORS AFFECTING HAZARDOUS WASTE QUANTITIES

In July 1994, Naval Air Station Moffett Field was officially closed and stewardship of the airfield and adjoining property was transferred to ARC. ARC now leases most of the facilities formerly occupied by the US Navy to other resident agencies (RAs). ARC now manages RA hazardous waste. In 1994, the following RAs submitted waste to ARC:

RA Code	Description	Location(s)
1	California Air National Guard (CANG)	Hangar 3
2A	Naval Air Reserve (VP-91)	Hangar 3
2B	Naval Air Reserve (MMF-ALFA/AIMD)	Hangar 3
2C	Naval Air Reserve (VR-55)	Hangar 1
2D	Naval Air Reserve (Hazardous Materials Warehouse)	Bldg. 45
2E	Naval Air Reserve	Bldg. 6
3A	Army Reserve (12th SF)	Bldgs. 111, 50
3B	Army Reserve (ASF)	Hangar 2
4A	Army (TRW/ASG)	Hangar 2
5A	Navy Exchange	NEX Building
6A	DoD, Defense Fuel Supply Point (DFSP) Fuel Farm	Bldg. 545

Routinely generated hazardous wastes, not exempted under Section 67100.2(c)(2) of Title 22 California Code of Regulations, for both NASA-ARC and the RAs are summarized in Table 1. Total RA waste quantities are listed under the column heading MFA (Moffett Federal Airfield).

Since July 1, 1994, RA routinely generated hazardous waste represents approximately 15% of the total waste quantity, or 54,728 lbs. of a total 376,288 lbs. A comparison of waste quantities for NASA-ARC and the RAs is as follows:

Waste	TOTAL (lbs.)	ARC (lbs.)	RAs (lbs.)	NASA %	RAs %
Total Generated (managed by CWMI* only)	566,768	438,797	127,971	77	23
Total Routinely Generated, Non-Exempt	376,288	321,560	54,728	85	15
Major (≥5% of total) Routinely Generated, Non-Exempt	273,078	244,784	28,294	90	10

*Chemical Waste Management, Inc.

TABLE 1

WASTE GENERATION QUANTITIES FOR NASA AMES RESEARCH CENTER (ARC) AND MOFFETT FEDERAL AIRFIELD (MFA) 1994									
					ARC	MFA	TOTAL		
Waste Stream	Waste No.	CWC	Waste Type	Frequency	lbs.	lbs.	lbs.	%	TOTAL BY CWC
caustic solutions/cleaners	8537	122	H	R	2,097	917	3,014	1%	3,014
electrolyte solution	1	132	H	R	4,400	0	4,400	1%	4,400
PD 680	7571	134	H	R	0	2,718	2,718	1%	2,718
batteries, Ni-Cad	8516	181	H	R	777	480	1,257	0%	
batteries, mercury	8498	181	H	R	9	904	913	0%	
batteries, alkaline	8515	181	H	R	260	536	796	0%	
batteries, lithium	9059	181	H	R	21	224	245	0%	
batteries, silver-zinc	8530	181	H	R	185	0	185	0%	3,396
1,1,1-TCA	6062	211	H	R	405	0	405	0%	
freon/freon water	28	211	H	R	648	2	650	0%	1,055
ethanol	3104	212	H	R	243	0	243	0%	243
paint thinner	3086	213	H	R	4,099	1,338	5,437	1%	5,437
paint, flammable	3087	214	H	R	3,039	4,318	7,357	2%	7,357
oil, w/o halogenated solvents	**22**	**221**	**H**	**R**	**30,540**	**4,957**	**35,497**	**9%**	
oil, hydraulic	20	221	H	R	6,269	7,193	13,462	4%	48,959
coolant, oil	none	223	H	R	8,240	600	8,840	2%	8,840
JP-5 fuel	**3153**	**331**	**H**	**R**	**5,240**	**15,070**	**20,310**	**5%**	
solvents	3102	331	H	R	10,763	2,327	13,090	3%	
diesel fuel	3012	331	H	R	895	1,400	2,295	1%	35,695
oil spill cleanup debris	**11**	**352**	**H**	**R**	**32,666**	**5,595**	**38,261**	**10%**	
oil contaminated rags	**5**	**352**	**H**	**R**	**29,435**	**2,672**	**32,107**	**9%**	
spent activated carbon	none	352	H	R	3,500	0	3,500	1%	
grease	7100	352	H	R	1,066	1,309	2,375	1%	76,243
cooling tower sludge	9071	491	H	R	840	0	840	0%	840
empty crushed containers	7	513	H	R	15,744	47	15,791	4%	
compressed gas cylinders	none	513	H	R	119	0	119	0%	15,910
Calfran sludge	**6**	**541**	**H**	**R**	**76,160**	**0**	**76,160**	**20%**	
Pace resin	7280	541	H	R	800	0	800	0%	
photographic solutions	various	541	H	R	3,914	636	4,550	1%	81,510
labpacks	**none**	**551**	**H**	**R**	**37,360**	**0**	**37,360**	**10%**	**37,360**
Calla 505	none	561	H	R	400	0	400	0%	
soil, contaminated	**7565**	**611**	**H**	**R**	**33,383**	**0**	**33,383**	**9%**	**33,383**
H=hazardous waste									
E=extremely hazardous waste									
W=non-hazardous waste									
R=routinely generated wastes									
N=non-routinely generated wastes									
X=wastes exempted by 22CCR 67100.2(c)									

TABLE 1

WASTE GENERATION QUANTITIES FOR NASA AMES RESEARCH CENTER (ARC) AND MOFFETT FEDERAL AIRFIELD (MFA) 1994									
					ARC	MFA	TOTAL		
Waste Stream	Waste No.	CWC	Waste Type	Frequ ency	lbs.	lbs.	lbs.	%	TOTAL BY CWC
oil, w/halogenated solvents	21	741	H	R	7,209	216	7,425	2%	
aerosol spray cans, flammable	2508	741	H	R	733	984	1,717	0%	
aerosol spray cans, non-flamm.	2000	741	H	R	101	285	386	0%	9,528
TOTALS					321,560	54,728	376,288	100%	
H=hazardous waste									
E=extremely hazardous waste									
W=non-hazardous waste									
R=routinely generated wastes									
N=non-routinely generated wastes									
X=wastes exempted by 22CCR 67100.2(c)									

TABLE 1

WASTE GENERATION QUANTITIES FOR NASA AMES RESEARCH CENTER (ARC) AND MOFFETT FEDERAL AIRFIELD (MFA) 1994									
					ARC	MFA	TOTAL		
Waste Stream	Waste No.	CWC	Waste Type	Frequency	lbs.	lbs.	lbs.	%	TOTAL BY CWC
EXTREMELY HAZARDOUS WASTES									
labpacks*	**none**	**551**	**E**	**R**	**174**	**0**	**174**	**10%**	**174**
hydrochloric acid solutions	**8100**	**791**	**E**	**R**	**1,460**	**40**	**1,500**	**90%**	**1,500**
TOTALS							1,674	100%	
*includes: sodium cyanide 2.1 lbs, calcium hypochlorite 4 lbs., sodium cacodylate 0.355 lbs., hydrofluoric acid 167 lbs., arsenic compounds 0.875 lbs.									
EXEMPT AND NON-ROUTINELY GENERATED WASTES									
ethylene glycol	7106	133	H	X	662	1,255	1,917	0%	
water contaminated w/oil	12	134	H	N	230,996	16,212	247,208	23%	
well water, clean	7210	134	W	X	2,000	0	2,000	0%	
asbestos containing material	9055	151	H	X	394,975	0	394,975	37%	
sand blast grit	none	181	H	X			230,400	21%	
steel grit abrasive	none	181	H	X	35,396	0	35,396	3%	
water w/fuel	7211	241	H	X	37,992	8	38,000	4%	
PCB oil	9070	261	E	X	4,275	0	4,275	0%	
PCB light ballasts	2	261	E	X	4,865	91	4,956	0%	
PCB capacitors	9, 10	261	E	X	460	0	460	0%	
PCB contaminated solid	9060	261	E	X	264	0	264	0%	
detergent	7073	331	W	R	234	1,963	2,197	0%	
gasoline	3044	331	H	X	780	1,315	2,095	0%	
latex paint	7076	331	W	R	1,002	746	1,748	0%	
cooling tower debris	26	352	H	R	15,000	0	15,000	1%	
lead paint solids	9054	352	H	N	65123	900	66023	6%	
batteries, lead acid	8128	352	H	X	2,896	3,635	6,531	1%	
JP5 filters	7128	352	H	X	1,750	22	1,772	0%	
oil filters, drained	7182	352	H	X	1,280	3,066	4,346	0%	
empty drums for recycling	77	512	W	R	15,155	1,238	16,393	2%	
mercury	8500	725	E	X	23	0	23	0%	
mercury filled items	8499	725	E	X	379	0	379	0%	
TOTALS					815,507	30,451	1,076,358	100%	
H=hazardous waste									
E=extremely hazardous waste									
W=non-hazardous waste									
R=routinely generated wastes									
N=non-routinely generated wastes									
X=wastes exempted by 22CCR 67100.2(c)									

APPENDIX A

				BASELINE YEAR, 1990 (lbs.)								CURRENT YEAR, 1994 (lbs.)							
Waste	Explanations	Ames Waste ID Nos.	CWC	onsite recycling	onsite treatment	onsite disposal	discharge to POTW	offsite recycling	offsite treatment	offsite disposal	air emissions	onsite recycling	onsite treatment	onsite disposal	discharge to POTW	offsite recycling	offsite treatment	offsite disposal	air emissions
caustic solutions, cleaners	10	8528, 8537	122														3,014		
steam cleaner		none	122							445									
electrolyte solution		1	132							11,680							4,400		
ethylene glycol		7106	133							1,600						1,917			
hangar wash		none	134							7,480									
PD 680	13	7571	134						NG								2,718		
waste water		none	134							3,960									
water w/oil	7	12	134		208,000			117,544					252,000			247,208			
aluminum sulfate		none	141							400									
asbestos containing material	3, 19	9055	151							356,030								394,975	
metal shavings		none	172							1,600									
batteries, acid	10	8128	181													6,531			
batteries, alkaline	10	8515	181															796	
batteries, lithium	10	9059	181														245		
batteries, mercury	10	8498	181													913			
batteries, Ni-Cad	10	8516	181													1,257			
batteries, silver-zinc	10	8530	181													185			
fire extinguish. chemical		none	181							400									
oil filters, drained, uncrushed	10	7182	181													2,800		4,346	
lead paint solids/cleanup debris		9054	181							6600								6,023	
paint booth and equipment	19	none	181							29,160								60,000	
soda ash		none	181							400									
solder dross		none	181													172			

				BASELINE YEAR, 1990 (lbs.)								CURRENT YEAR, 1994 (lbs.)							
Waste	Explanations	Ames Waste ID Nos.	CWC	onsite recycling	onsite treatment	onsite disposal	discharge to POTW	offsite recycling	offsite treatment	offsite disposal	air emissions	onsite recycling	onsite treatment	onsite disposal	discharge to POTW	offsite recycling	offsite treatment	offsite disposal	air emissions
abrasive grit	8, 11, 19	none	181							33,000								276,100	
1,1,1-TCA		6062	211					440								405			
freon/freon water		28	211					880								650			
ethanol		3104	212					440								243			
paint thinner		3086	213					440								5,437			
solvents	16	3102	214					4,720	2,570							13,090			
paint, flammable	10	3087	214														7,357		
oil	2, 15	21, 22	221					2,480								48,959			
oil w/halogenated solvents	15	21	221/ 741					69,960								7,425			
coolant, oil	7	none	223					13,040								8,840			
water w/fuel	7	7211	241					22,320		13,680						38,000			
PCB ballasts	19	2	261							3,200								4,956	
PCB contaminated solids	19	9060	261							155,920								264	
PCB oil	19	9069, 9070	261							87,841							4,275		
PCB transformers	1	none	261							39,349								11,045	
PCB capacitors	19	9, 10	261							2,000								469	
phenolic resin		none	272							400									
diesel fuel	2	3012	331													2,295			
Dow Corning 200		none	331					440											
JP-5	2, 17	3153	331					680								20,310			
cooling tower debris	19	26	352							NG								15,000	

				BASELINE YEAR, 1990 (lbs.)								CURRENT YEAR, 1994 (lbs.)							
Waste	Explanations	Ames Waste ID Nos.	CWC	onsite recycling	onsite treatment	onsite disposal	discharge to POTW	offsite recycling	offsite treatment	offsite disposal	air emissions	onsite recycling	onsite treatment	onsite disposal	discharge to POTW	offsite recycling	offsite treatment	offsite disposal	air emissions
oil contaminated rags	14	5	352							8,900								32,107	
spent activated carbon	18	none	352					NG								3,500			
spill cleanup debris	14	11	352							15,200								38,261	
cooling tower sludge		9071	491							1,200								840	
vault sludge		none	491							2,440									
empty drums	5	77	512					16,544								22,490			
empty tanks		none	512					32,250								7,950			
compressed gas cylinders		none	513							200						80	39		
empty containers		7	513							20,900								15,791	
Calfran sludge	6, 12	6	541						NG								76,160		
Pace resin w/silver	12	7280	541						NG							800			
photographic solutions	7, 20	var.	541					2,680		445						4,550			
labpacks		none	551						59,144								37,360		
Oakite 61N		none	561							400									
spent Oakite		none	561							445									
Calla 505		none	561							400							400		
soil, contaminated	8, 18	7565	611							393,000								33,383	
mercury and mercury contaminated material		none	725					300		4,550						402			
aerosol spray cans	10	2508, 2000	741														2,103		
hydrochloric acid solutions	9	8100	791						1,020								1,500		
TOTALS				0	208,000	0	0	285,158	62,734	1,203,225	0	0	252,000	0	0	446,409	139,571	894,356	0

Waste	Explanations	Ames Waste ID Nos.	CWC	1990 (BASELINE) TOTALS	1994 (CURRENT) TOTALS	NET REDUCTION SINCE 1990	% REDUCTION	1990 CWC TOTALS	1994 CWC TOTALS	% REDUCTION BY CWC
caustic solutions, cleaners	10	8528, 8537	122	0	3,014	NA	NA			
steam cleaner		none	122	445	0	445	100%	445	3,014	NA
electrolyte solution		1	132	11,680	4,400	7,280	62%	11,680	4,400	62%
ethylene glycol		7106	133	1,600	1,917	NR	NR	1,600	1,917	NR
hangar wash		none	134	7,480	0	7,480	100%			
PD 680	13	7571	134	0	2,718	NA	NA			
waste water		none	134	3,960	0	3,960	100%			
water w/oil	7	12	134	325,544	499,208	NR	NR	336,984	501,926	NR
aluminum sulfate		none	141	400	0	400	100%	400	0	100%
asbestos containing material	3, 19	9055	151	356,030	394,975	NR	NR	356,030	394,975	NR
metal shavings		none	172	1,600	0	1,600	100%	1,600	0	100%
batteries, acid	10	8128	181	NA	6,531	NA	NA			
batteries, alkaline	10	8515	181	NA	796	NA	NA			
batteries, lithium	10	9059	181	NA	245	NA	NA			
batteries, mercury	10	8498	181	NA	913	NA	NA			
batteries, Ni-Cad	10	8516	181	NA	1,257	NA	NA			
batteries, silver-zinc	10	8530	181	NA	185	NA	NA			
fire extinguish. chemical		none	181	400	0	400	100%			
oil filters, drained, uncrushed	10	7182	181	0	7,146	NA	NA			
lead paint solids/cleanup debris		9054	181	6,600	6,023	577	NA			
paint booth and equipment	19	none	181	29,160	60,000	NR	NR			
soda ash		none	181	400	0	400	100%			
solder dross		none	181	0	172	NA	NA			

Waste	Explanations	Ames Waste ID Nos.	CWC	1990 (BASELINE) TOTALS	1994 (CURRENT) TOTALS	NET REDUCTION SINCE 1990	% REDUCTION	1990 CWC TOTALS	1994 CWC TOTALS	% REDUCTION BY CWC
abrasive grit	8, 11, 19	none	181	33,000	276,100	NR	NR	69,560	359,368	NR
1,1,1-TCA		6062	211	440	405	35	8%			
freon/freon water		28	211	880	650	230	26%	1,320	1,055	20%
ethanol		3104	212	440	243	197	45%	440	243	45%
paint thinner		3086	213	440	5,437	NR	NR	440	5,437	NR
solvents	16	3102	214	7,290	13,090	NR	NR			
paint, flammable	10	3087	214	0	7,357	NA	NA	7,290	20,447	NA
oil	2, 15	21, 22	221	2,480	48,959	NR	NR			
oil w/halogenated solvents	15	21	221/ 741	69,960	7,425	16,056	23%	72,440	56,384	22%
coolant, oil	7	none	223	13,040	8,840	4,200	32%	13,040	8,840	32%
water w/fuel	7	7211	241	36,000	38,000	NR	NR	36,000	38,000	NR
PCB ballasts	19	2	261	3,200	4,956	NR	NR			
PCB contaminated solids	19	9060	261	155,920	264	155,656	100%			
PCB oil	19	9069, 9070	261	87,841	4,275	83,566	95%			
PCB transformers	1	none	261	39,349	11,045	28,304	72%			
PCB capacitors	19	9, 10	261	2,000	469	1,531	77%	288,310	21,009	93%
phenolic resin		none	272	400	0	400	100%	400	0	100%
diesel fuel	2	3012	331	0	2,295	NA	NA			
Dow Corning 200		none	331	440	0	440	100%			
JP-5	2, 17	3153	331	680	20,310	NR	NR	1,120	22,605	NR
cooling tower debris	19	26	352	0	15,000	NA	NA			

Waste	Explanations	Ames Waste ID Nos.	CWC	1990 (BASELINE) TOTALS	1994 (CURRENT) TOTALS	NET REDUCTION SINCE 1990	% REDUCTION	1990 CWC TOTALS	1994 CWC TOTALS	% REDUCTION BY CWC
oil contaminated rags	14	5	352	8,900	32,107	NR	NR			
spent activated carbon	18	none	352	0	3,500	NA	NA			
spill cleanup debris	14	11	352	15,200	38,261	NR	NR	24,100	88,868	NR
cooling tower sludge		9071	491	1,200	840	360	30%			
vault sludge		none	491	2,440	0	2,440	100%	3,640	840	77%
empty drums	5	77	512	16,544	22,490	NR	NR			
empty tanks		none	512	32,250	7,950	24,300	75%	48,794	30,440	38%
compressed gas cylinders		none	513	200	119	81	41%			
empty containers		7	513	20,900	15,791	5,109	24%	21,100	15,910	25%
Calfran sludge	6, 12	6	541	NA	76,160	NA	NA			
Pace resin w/silver	12	7280	541	NA	800	NA	NA			
photographic solutions	7, 20	var.	541	3,125	4,550	NR	NR	3,125	81,510	NR
labpacks		none	551	59,144	37,360	21,784	NA	59,144	37,360	37%
Oakite 61N		none	561	400	0	400	100%			
spent Oakite		none	561	445	0	445	100%			
Calla 505		none	561	400	400	0	0%	1,245	400	68%
soil, contaminated	8, 18	7565	611	393,000	33,383	359,617	92%	393,000	33,383	92%
mercury and mercury contaminated material		none	725	4,850	402	4,448	92%	4,850	402	92%
aerosol spray cans	10	2508, 2000	741	NA	2,103	N/A	N/A			N/A
hydrochloric acid solutions	9	8100	791	1,020	1,500	NR	NR	1,020	1,500	NR
TOTALS				1,759,117	1,732,336	26,781	2%			

EXPLANATIONS SHEET
TO
HAZARDOUS WASTE MANAGEMENT TABLE

1	converted to pounds using 2.205 lbs./kg.
2	converted to pounds using 7.5 lbs./gallon
3	converted to pounds using an average weight of 1,032 lbs./cubic yard
4	converted to pounds using 7 lbs./gallon
5	converted to pounds using 44 lbs./drum
6	converted to pounds using 11.2 lbs./gallon
7	converted to pounds using 8 lbs./gallon
8	converted to pounds using 1,500 lbs./cubic yard
9	converted to pounds using 12 lbs./gallon. 85 gallons of hydrochloric acid solutions were disposed of in 1990. The 1990 figure of 680 lbs. has been revised to reflect the conversion rate of 12 lbs./gallon to be consistent with the 1994 figure.
10	In 1990, these wastes were included in the "labpack" waste stream and were not identified as discrete wastes. See explanation in Section 5.5.
11	Increase due to large abatement/repainting project, "40 ft. x 80 ft. Protective Coatings Project," that started in May 1990. See Section 4.1.1.
12	The first Calfran Unit (PTU-50) was installed Feb. 14, 1991. The Pace Scrubber was installed in June 1990. No Calfran product sludge was generated prior to installation and no Pace resin was disposed of in 1990.
13	PD 680 is a mineral spirit based degreaser used by the Naval Air Reserves and California Air National Guard. Prior to 1994, NASA-ARC did not generate this waste. The US Navy is phasing out use of PD 680 for replacement with an environmentally preferable product.
14	Increase in oily rags and spill cleanup material is attributable to several factors: a) more generators are aware of proper disposal practices for contaminated materials in 1994 than in 1990 (i.e. contaminated wastes are not thrown in the regular trash), b) resident agencies contributed to the increase, 13% to oily rags and 24% to spill cleanup.
15	The quantity of solvent contaminated oil has decreased 89% since 1990. Conversely, the uncontaminated oil quantity has increased. See Section 5.2. The overall oil waste has decreased 22%.
16	40% of the 5,800 lb. increase in solvent waste was generated by resident agencies.
17	70% of the 21,485 lb. increase in JP5 waste was generated by resident agencies.
18	Waste stream is result of remedial activity.
19	Waste stream is result of demolition/renovation of facilities.
20	A total of 232 gallons of photographic developers, fixers, and activator solutions were disposed of in "labpack" drums in addition to the figures shown in the table. The weight associated with these solutions is included in the "labpacks" waste quantity. See Section 5.5.
NA	Not applicable - no comparison can be made because the waste stream was not identified or generated in baseline year (1990)
NG	Waste not generated in 1990.
NR	No reduction.