COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
TDD (804) 698-4021
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

HAZARDOUS WASTE PROGRAM
OFFICE OF WASTE PERMITTING AND COMPLIANCE
DIVISION OF LAND AND PROTECTION REVITALIZATION

TEMPORARY EMERGENCY PERMIT
FOR TREATMENT OF HAZARDOUS WASTE

Permit Granted to:	NASA Langley Research Center Building1195, Mail Stop 136 Hampton, VA 23681
EPA Identification Number:	VAP000016379
Permit Issuance Date:	January 16, 2013
Permit Expiration Date:	Upon completion of action described in this Permit or by February 15, 2013, whichever occurs first.

Issued by:
Department of Environmental Quality (DEQ)
Office of Waste Permitting and Compliance
629 East Main Street
P.O. Box 1105
Richmond, Virginia 23218

Authority:
Commonwealth of Virginia Hazardous Waste Management Regulations (VHWMR), 9 VAC 20-60-270, promulgated under the authority of Chapter 14, Title 10.1, Code of Virginia (1950), as amended, and Title 40 Code of Federal Regulations (CFR) § 270.61, Emergency Permits.

Name and Address of Permit Applicant:
NASA Langley Research Center
Building1195, Mail Stop 136
Hampton, VA 23681
(757) 864-8058

Name, Address of Generator Facility, Phone Number, and EPA ID Number:
NASA Langley Research Center
Building1195, Mail Stop 136
Hampton, VA 23681
(757) 864-8058

EPA ID VA2800005033

Contact Name and Phone Number:
NASA Langley Research Center
Attn: Dave Steigerwald
Building1195, Mail Stop 136
Hampton, VA 23681
Office: (757) 864-8058
Cell: (757) 592-3326
Fax: (757) 864-2033
E-mail: david.j.steigerwald@nasa.gov

Name, Location and EPA ID Number of Facility:
NASA Langley Research Center
Building 1166
Hampton, VA 23681
EPA ID VAP000016379

Action Authorized:

NASA Langley Research Center is permitted by this Temporary Emergency Permit to operate as a facility for the treatment of the hazardous waste listed below utilizing the procedures described under the heading "Treatment Procedures."

Description of Wastes:

Waste #1 – Parlodion

1) Waste name: Parlodion strips (99% cellulose nitrate and 1% urea)
2) Manufacturer: Mallinckrodt
3) Hazardous waste codes: D003
4) Quantity: One by1-pound and one by 1-ounce, each in amber glass jars
5) Age of the material: 59 years old
6) Physical state: solid

Waste #2 – Butylmagnesium chloride

1) Waste name: n-butylmagnesium chloride 20% in tetrahydrofuran (THF)
2) Manufacturer: unknown
3) Hazardous waste codes: D001, D003
4) Quantity: One 30-ml
5) Age of the material: unknown
6) Physical state: solid (THF has evaporated; material is dry)

Attachment 4 contains the MSDS for the chemicals listed above.

Location of Waste – Description and Map:

NASA Langley Research Center
Building 1205
Hampton, VA 23681

See Attachment 1 for the map showing the storage location.

Qualifications of Individual(s) Performing the Treatment:

Reactives Management Corporation
1025 Executive Blvd., Suite 101
Chesapeake, VA 23320

Name of Technicians: George C. Walton & Cherie C. Walton

See Attachment 2 for qualifications/resumes of individuals performing the treatment.

When Treatment Is To Occur?

Treatment began at approximately 0930 on February 9, 2013 and ended several hours later.

Treatment Area – Description and Map:
Treatment occurred within the earthen berms at Building 1158 at NASA Langley Research Center.

Transportation route: See Attachment 3 for a map of the treatment area. See Attachment 1 for a map of the transportation route.

Name and Phone Number of State and Local Officials Contacted Prior to Treatment:
Department of Environmental Quality
Julia M. King-Collins
Environmental Specialist II
629 East Main Street
Richmond, VA
Phone: (804) 698-4237
E-mail: julia.king-collins@deq.virginia.gov

Virginia Department of Environmental Quality
Tidewater Regional Office
Milt Johnston, Land Program Manager
5636 Southern Boulevard, Virginia Beach, Virginia 23462
Phone: (757) 518-2151).
E-mail: Milton.Johnston@deq.virginia.gov

Local Fire Department:
Hampton Fire Department
NASA Langley Research Center Fire Department
Attn: Doug Smith, Fire Chief
Langley Boulevard, Hampton, VA 23681
Phone: Emergency – 911
Office: (757) 864-5756
Cell: (757) 876-1053

Local Police Department:
NASA Security Department contact: Mike Walther – cell: (757) 651-3920
Hampton Police Department: 911

Evacuation Route:

No evacuation was necessary.

911 would have been called in the event of personnel injury.

Please see Attachment 3 for a map of the evacuation route.

Treatment Procedures:

NOTES:

- The primary goal of Reactives Management Corporation is to protect persons, property, and the environment from the hazards posed by this hazardous waste and these procedures.
- The work was performed within the earthen berms that surround Buildings 1158 and 1158A.
- Two-way radios, cell phones, and other transmitting devices were turned off. They were NOT powered on or used within 15 feet of the firing circuit.
- A blaster's galvanometer was used to test the firing circuit and each component thereof.
- The treatment team followed all standard explosives safety practices.
- No special personal protective equipment (other than safety glasses) was required for this work.
- Explosives in the vicinity were moved to a temporary storage location.

PARLODION TREATMENT PROCEDURES:

1. A wooden pallet was be placed on the ground in the work area and covered with sand bags.
2. The hazardous waste was placed in a bomb box, covered with a bomb blanket and a fire blanket and moved from the current storage location to the work area (next to the pallet with sand bags).

3. Explosive devices consisting of shaped charges and electric detonators (blasting caps) were used to destroy the waste. The explosive devices were retrieved from Building 1159 and staged in the work area approximately 20 feet from the hazardous waste to be destroyed.

4. At the work site, the smaller container of waste was taped (using electrician's tape) to the large container. The containers were placed near the center of the sand bags.

5. The explosive devices were affixed to the containers using electrician's tape. At the discretion of the treatment team, a small container of gasoline was placed adjacent to the Parlodion containers.

6. Additional sand bags were placed all around the containers of waste to support them and to help contain glass fragments.

7. Final wiring of the shot was performed. When the area was all clear, the shot was fired. The detonation completely destroyed the waste.

8. After an appropriate waiting period (normally 5 to 10 minutes), the residue was examined. No additional explosives were used to destroy any intact Parlodion.

TREATMENT PROCEDURES FOR ALL OTHER MATERIAL

1. The work area was selected and staged.

2. The hazardous waste was placed in a bomb box, covered with a bomb blanket and a fire blanket, and then moved from the building to the work area.

3. At the work site, the waste was placed in a 5-gallon pail with some vermiculite for cushioning and stabilization.

4. The 5-gallon pail was placed in a 20- or 30-gallon drum and surrounded by vermiculite. That drum was placed in a 55-gallon drum and surrounded by vermiculite.

5. The container of waste was wired with 1 to 3 electric blasting caps. The caps were secured with electrical tape. Additional vermiculite was added.

6. A loose covering was placed on top of the drums. The covering was a bomb blanket.

7. Final wiring of the shot was performed. When the area was cleared, the shot was fired. The detonation completely destroyed the waste and any peroxides. As a result of the detonation process, the characteristics of ignitability and reactivity no longer existed. The only remaining waste left after the detonation was 1% broken glass and 99% vermiculite which was accumulated in a 55-gallon DOT-approved open head drum.

Transportation Route and Time of Transportation: if material will be transported off-site:
The waste was not transported off-site.

Permit Termination:
This Permit may be terminated by the DEQ at any time, without process, if the determination is made that termination is appropriate to protect human health and the environment.

Permit Standards with which Compliance is Required:
Effective Immediately:

> VHWMR Part III, 9 VAC 20-60-265, as adopted from 40 CFR, Part 265, Subpart Q, Chemical , Physical, and Biological Treatment, and Subpart P, Thermal Treatment, as applicable.
>
> VHWMR Part III, 9 VAC 20-60-264, as adopted from 40 CFR, Part 264, Subpart B, General Facility Standards, Subpart C, Preparedness and Prevention, and Subpart D, Contingency Plan and Emergency Procedures, Subpart X, Miscellaneous Units, as applicable.
>
> VHWMR Part III, 9 VAC 20-60-270, as adopted from 40 CFR, Part 270, EPA Administered Permit Programs: The Hazardous Waste permit Program, and
>
> VHWMR Part XII, Permit Application and Annual Fees, 9 VAC 20-60-1260, Purpose, Scope and Applicability

All residuals from the treatment will be managed in accordance with VHWMR Part III, 9 VAC 20-60-262, as adopted from 40 CFR, Part 262, Standards Applicable to Generators of Hazardous Wastes.

Reporting:
Within 30 days of permit expiration or termination, the Permittee shall submit to the Department a written Report detailing the times, pertinent events, sampling and analytical data, as applicable, and results of the permitted treatment activity, and any subsequent storage, treatment, and disposal of the remaining waste residuals. Waste manifests, as applicable, for shipment of remaining residuals to a RCRA Treatment, Storage, or Disposal (TSD) Facility, or as applicable, the documentation associated with shipment or to a RCRA Subtitle D facility, shall be included in the Report submittal. Please mail this Report to the following address:

Department of Environmental Quality
Attn: Julia M. King-Collins
Environmental Specialist II
629 East Main Street
P.O. Box 1105
Richmond, VA 23218

Reason for Issuance:
The Department of Environmental Quality has determined that, because of the circumstances and nature of the waste, expedient action to protect human health and the environment was necessary. The waste was determined to be potentially unstable and treatment on-site was deemed appropriate to be protective of human health and the environment.

A verbal approval of the Emergency Permit was issued on January 7, 2013.

This written Emergency Permit is in accordance with the Virginia Hazardous Waste Management Regulations (VHWMR), 9 VAC 20-60 and 9 VAC 20-60-270, promulgated under the authority of Chapter 14, Title 10.1, Code of Virginia (1950), as amended, and Title 40 Code of Federal Regulations (CFR) § 270.61, Emergency Permits.

Public Comment Period:
A 30-day public comment period is provided starting on January 24, 2013. The DEQ solicits written comments on the issuance of the Permit until 5:00 PM, February 25, 2013. The comments must be received at the DEQ's Richmond Office address before the end of the comment period.

Written comments are to be sent to Julia King-Collins, Virginia Department of Environmental Quality, 629 East Main Street, P.O. Box 1105, Richmond, Virginia 23218. (Phone: (804) 698-4237; e-mail: julia.king-collins@deq.virginia.gov.))

A copy of the Permit may be obtained and reviewed at the above DEQ's Richmond Office, and at the DEQ's Tidewater Regional Office (Attn: Milton Johnston), 5636 Southern Boulevard, Virginia Beach, Virginia 23462, (757) 518-2151).

The DEQ will accept written comments from the public by electronic mail (e-mail). All comments received by mail or e-mail must provide the commenter's name, address, and phone number, and an e-mail address should be provided, if available. Comments will not have an effect on the issuance of this Permit; however, comments will be reviewed and considered with regard to issuance of future emergency permits.

Emergency Occurrence:
In the event of an emergency occurrence outside the scope of this Permit, contact Ms. Leslie A. Romanchik at (804) 698-4129, Hassan Vakili at (804) 698-4155, or Julia M. King-Collins, at (804) 698-4237. Upon successful completion of the events authorized by this Permit, contact Julia M. King-Collins, at (804) 698-4237 or by e-mail at julia.king-collins@deq.virginia.gov.

Attachments
Attachment 1: Map showing the storage location and transportation route.
Attachment 2: Qualifications/resumes of individuals performing the treatment.
Attachment 3: Map of the evacuation route.
Attachment 4: MSDS for Parlodion and Butylmagnesium Chloride

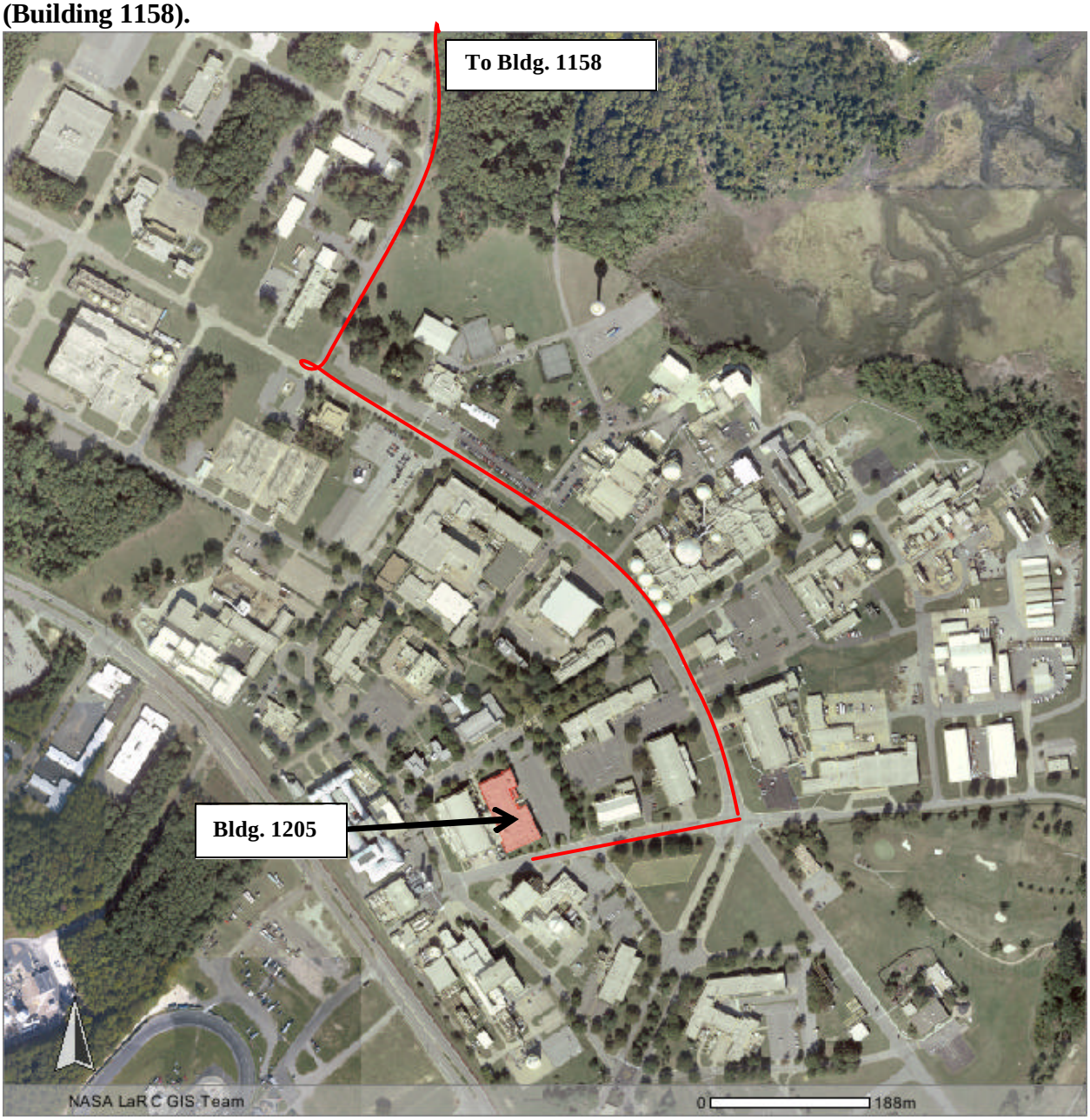
January 16, 2013

Leslie A. Romanchik

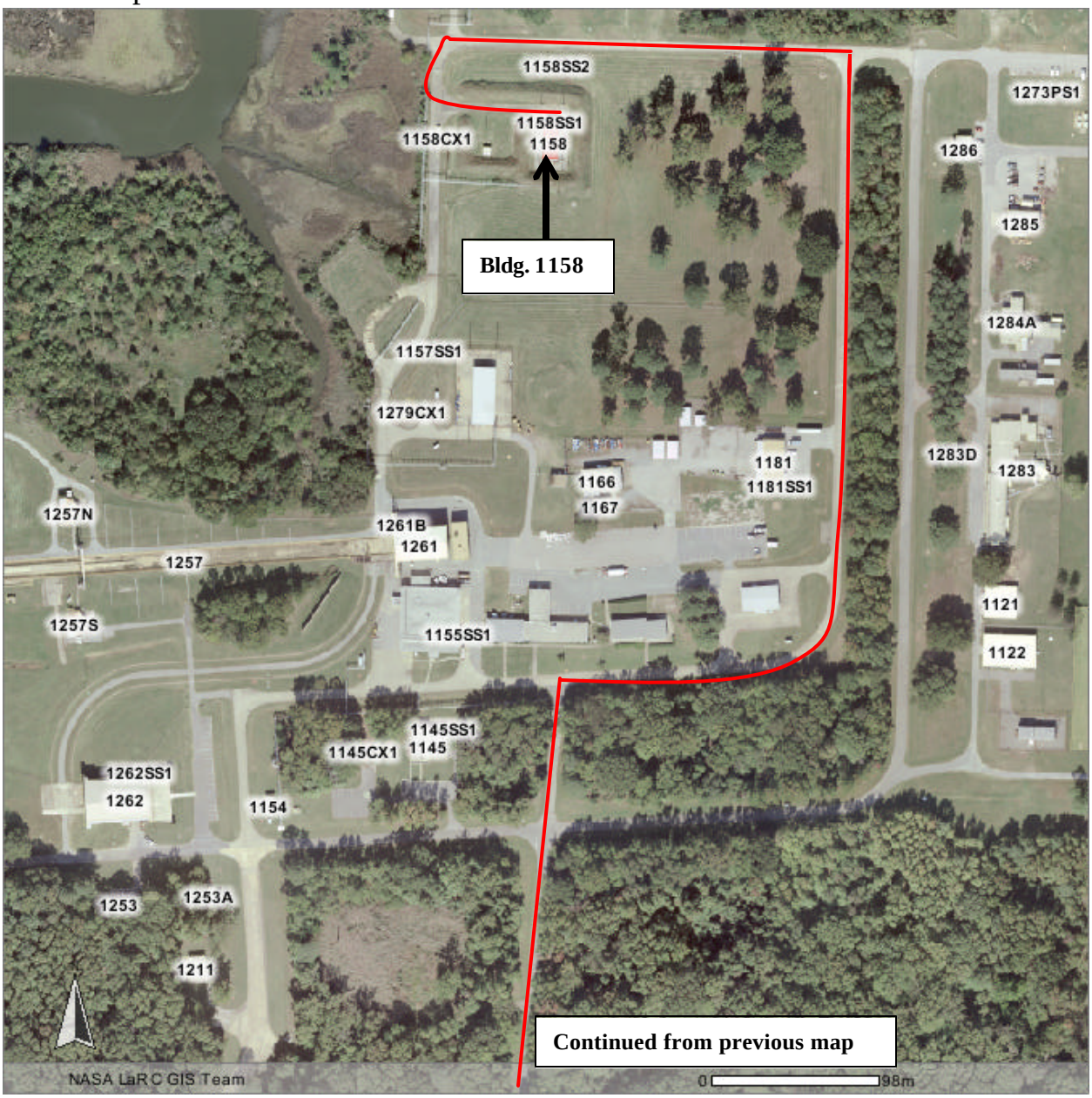
Date

Leslie A. Romanchik
Hazardous Waste Program Manager

Attachment 1 — Transportation route map from storage area (Building 1205 to work area (Building 1158).



Route Map – cont'd



Attachment 2 — Resumes

Reactives Management Corporation
Protecting Human & Environmental Resources Since 1986

CHERIE C. WALTON
Resume

CITIZENSHIP: United States

EDUCATION

- B.S. (Psychology), University of the State of New York - 1990

PRIMARY CERTIFICATIONS

- Certified Safety Professional (#17406; November 20, 2002)
- Qualified Person for Fall Protection
- Department of Transportation Hazmat Employee
- Hazardous Waste Operations & Emergency Response (HAZWOPER 40-hour) with current refresher
- HAZWOPER Supervisor
- Licensed blaster in Maryland and Virginia

PROFESSIONAL ORGANIZATIONS/COMMITTEES

- American Society of Safety Engineers
- City of Chesapeake Natural Event Mitigation Advisory Committee (Chairman)
- City of Chesapeake Groundwater Committee
- National Contract Management Association
- Restoration Advisory Board, Former Nansemond Ordnance Depot
- NASA Pyrotechnics Working Group

PUBLICATIONS

- Wilson, C. C., and Walton, G. C. "Perchloric Acid Fume Hoods and Exhaust Systems." AIPE Facilities, July/August, 1995.
- Walton, C. C. and Walton, G. C., "Hazardous Materials Spills and Response". In The Safety Professionals Handbook: Management Applications, Joel M. Haight, editor; Illinois: American Society of Safety Engineers. 2008.

EXPERIENCE

- 1993 - present: Vice President and co-owner, Reactives Management Corporation, Chesapeake, Virginia.

• 1991 - 1993: Hankison International, Newport, North Carolina. Responsible for accuracy of import/export paperwork and development of safety programs.

REPRESENTATIVE PROJECTS

General, Regulatory, and Consulting:

• Perform OSHA general industry and construction site compliance audits and health/safety inspections for a wide variety of government, commercial, industrial, academic, and private facilities.

• Develop, review, and/or update general industry and construction health and safety plans/programs, contingency plans, emergency response plans, fall protection plans (including those in accordance with EM 385-1 and NAVFAC requirements), respiratory protection programs, Activity Hazard Analyses (AHAs), Standard Operating Procedures (SOPs), and various other types of plans and programs for various commercial, government, and private clients.

• Perform site inspections/evaluations, developed Title V (air) and NPDES/VPDES (stormwater) permits, and perform annual comprehensive evaluations for an international construction company.

• Performed a facility hazard analysis in accordance with NASA-STD-8719.7 of several buildings at the Goddard Space Flight Center.

• Performed confined space hazard evaluations, monitoring, and entries for numerous types of facilities including peanut processing facilities, a waste-to-energy plant, sewer pump stations, underground pipe chases, NASA facilities, and many others.

• Developed and submitted numerous hazardous waste emergency treatment permits.

• Develop and edit/update training manuals for courses in:

? Several OSHA construction and general industry programs including the HAZWOPER series, confined space entry, fall protection, electrical safety, lockout/tagout, bloodborne pathogens, hazard communication, respiratory protection, etc.

? The transportation of hazardous materials including DOT, IATA, and IMDG regulations;

? EPA programs and regulations such as hazardous waste management, universal waste management, land disposal restrictions, etc.

? Numerous health, safety, and chemical-specific courses including compressed gas cylinder management, medical gases, medical waste management, explosives safety, hantavirus, small spills and leaks, laboratory safety, etc.

- Developed a hazardous waste storage unit closure plan for a prominent Virginia University in accordance with state and federal regulations.

- Performed a comprehensive environmental and safety audit of a manufacturing facility with emphasis on federal, state, and local regulatory compliance and ISO 14000 compliance. Reviewed written programs and developed new plans. Recommended specific training for all personnel based on job description and duties.

- Performed airport audit and inspection services including law enforcement response records audit, security training records audit, and inspection of airport incident management procedures IAW 49 CFR 1542.

- Performed third party asbestos air monitoring at government facilities in Virginia.

- Routinely package and certify hazardous materials for transportation.

- Reviewed and edited equipment technical and operations manuals for an international manufacturer of heavy, off-road mining equipment. Also reviewed, updated, and revised the corporate health and safety manual including the addition of new sections.

Hazardous Materials Projects

- Norfolk, Virginia: Chemically accelerated the reaction (polymerization reaction) of several hundred gallons MEKP with resin.

- Nationwide: Performed the hydration and repackaging of many pounds of dry picric acid.

- Various Virginia locations: Safely managed numerous vials of chloropicrin that were discovered in various safes throughout the Tidewater area. All vials were carefully removed from the door of the safe, dislodged from their protective case, and packaged for transportation and disposal.

- Nationwide: Disassembled and decontaminated numerous perchloric acid-contaminated fume hoods throughout the U.S. for organizations such as the U.S. FDA, Purdue University, Virginia Tech, Procter and Gamble, University of Kansas Medical Center, and many other public and private institutions. In several cases, pre- and/or post-decontamination wipe samples were obtained and analyzed using an ion-specific electrode.

- Atlanta, GA: Decontaminated a dioxin laboratory for the Centers for Disease Control & Prevention (CDC). The lab had been used to synthesize dioxin standards in the 1980s and was closed in the early 1990s. More than 15 yd^3 of waste and debris was removed from the lab, including chemicals such as dioxin standards, aflatoxins, flammables, and poisons; laboratory instruments; glove boxes; HEPA filters; and various other items. The lab was then thoroughly decontaminated. Twenty wipe samples and three air samples were obtained to confirm the lab was safe for re-occupancy.

- Nationwide: Completed chemical inventory for numerous National Oceanic and Atmospheric Administration (NOAA) laboratories throughout the United States. During inventories, identified hazardous materials that were aged, degraded, and/or unsafe; recommended safe handling, storage, and segregation techniques; and evaluated each laboratory for OSHA compliance. Assisted in the development of database data entry protocols.

- Havelock, NC: Provided hazardous materials technical support for an engineering study to enhance compressed gas detection and monitoring at a military facility using oxidizers, poison gases, and flammable solvents during jet engine turbine parts cleaning.

Compressed Gas Cylinders

- Silver Spring, MD: Managed six methane cylinders, each being approximately 2' wide x 23' long. The cylinders had been manifolded together, and the manifold was damaged. Torches were rigged, and the product burned off. On a separate trip to the same BRAC facility, a propane tank approximately 8' in diameter x 50' long was emptied.

- Chesapeake, VA: Was part of the team that managed approximately 1,200 compressed gas cylinders found in a scrap metal facility. An initial survey was performed to determine the types and condition of the cylinders. Laborers using heavy equipment helped distribute cylinders from the main pile and the other areas to

the staging and work areas. All cylinders were examined thoroughly and managed according to condition and contents.

- Various locations in Virginia and North Carolina: Identified and managed several thousand cylinders at several scrap metal facilities in several cities (on-going).

- Camp Peary, VA: Safely managed an old, degraded cylinder of chlorine that was found in an abandoned water treatment facility at Camp Peary.

- Groton, CT: Supervised the excavation, identification, and management of 19 buried compressed gas cylinders located on a military facility.

Explosives and Unexploded Ordnance

- Hampton, VA: Explosives Safety Officer for NASA Langley Research Center (on-going). Provide oversight and management of NASA's explosives users programs as well as technical and NASA-specific support as needed. Also inventoried, evaluated, classified, and packaged several thousand waste explosive articles, materials, and devices. Performed on-site detonation of hundreds of unstable items could not be shipped. Participate in the NASA-wide Pyrotechnic Working Group.

- Suffolk, Virginia: Performed numerous UXO surveys (including down-hole monitoring) and UXO QC work at the former Nansemond Ordnance Depot, a Formerly Utilized Defense Site (FUDS) for federal and state agencies and private engineering firms.

- Charles City, VA: Provided emergency response services for the Virginia Department of Emergency Services and Virginia Department of Environmental Quality in response to a request for assistance in managing an incident involving hundreds of pounds of fireworks and chemicals used in making fireworks. Provided identification, segregation, packaging, transportation, and disposal of hazardous and non-hazardous materials found at the scene.

- Grundy, VA: Excavated and burned approximately 5,000 pounds of degraded dynamite that had been abandoned following mining operations.

- Fort Eustis and Fort Lee, VA: Provide UXO surveys and clearance support for various construction projects at Fort Eustis and Fort Lee.

- Madison, WI, Long Island, NY, and Joliet, IL: Classified, packaged, and shipped numerous explosive materials and devices that were confiscated by ATF.

- Chesapeake, VA: Evaluated the condition of, and inventoried, approximately 3,000 pounds of illegal fireworks confiscated by the Chesapeake Fire Department.

- Fairfax, VA: Managed (evaluated, classified, packaged, and shipped) several thousand pounds of illegal fireworks and chemicals used in the manufacture of fireworks for the Fairfax Fire Department Arson Unit.

- Elkton, MD: Reviewed and revised UXO safety and work plans for work at an EPA removal action site. Provide on-going UXO quality assurance inspections to ensure compliance with the work plan and standard, accepted UXO industry practices.

Reactives Management Corporation
Protecting Human & Environmental Resources Since 1986

GEORGE C. WALTON

Resume

CITIZENSHIP: United States

EDUCATION & SPECIALIZED SCHOOLS

- M.S. (Botany) - The Pennsylvania State University, 1970
- M.S. (Biology) - The Pennsylvania State University, 1974
- U.S. Army Explosive Ordnance Disposal School, Redstone Arsenal, AL/ Indian Head, MD, 1976
- National Fire Protection Association Standard 1041 Instructor Training course, 1991

PRIMARY CERTIFICATIONS

- Certified Hazardous Materials Manager (Master Level) #00983
- Fellow, American Institute of Chemists
- Certified Safety Executive - W S O
- Senior Explosive Ordnance Disposal Technician Supervisor, 1998
- OSHA Authorized Instructor (construction industry) #318746

SELECTED PUBLICATIONS

- Wilson, C. C., and Walton, G. C. "Perchloric Acid Fume Hoods and Exhaust Systems." AIPE Facilities, July/August, 1995.
- Walton, G. C. "Disposal of Shock- and Water- Sensitive, Pyrophoric, and Explosive Materials" in American Chemical Society Handbook of Chemical Health and Safety, R. J. Alamo, editor; New York: Oxford University Press. 2001
- Walton, C. C. and Walton, G. C. (2008), "Hazardous Materials Spills and Response". In The Safety Professionals Handbook: Management Applications, Joel M. Haight, editor; Illinois: American Society of Safety Engineers. 2008.

EXPERIENCE

- 1986 - present: President and owner, Reactives Management Corporation, Chesapeake, Virginia.

REPRESENTATIVE PROJECTS

Hazardous Materials Projects

- California: Wrote proposal and developed safety plan for the decontamination and dismantling of organophosphate nerve agent test facility. Excavation contamination, run-on/ run-off control and sampling and analysis protocols coordinated with regional and state water control agencies.

- Maryland: Hazardous materials manager for insurance company investigation of costs of emergency response to and clean up at ink manufacturing facility fire. Investigation resulted in a refund of more than $50,000 in response and disposal costs.

- New York: Developed system and safety plan to remove explosive levels of organic perchlorates from laboratory fume hood system in teaching and research hospital. The main laboratory building, two blocks long and up to 17 stories tall, included over 350 separate fume hoods in seven separate exhaust systems.

- Various: Performed confined space hazard evaluations, monitoring, and entries for numerous types of facilities including peanut processing facilities, sewer pump stations, rail cars, petroleum storage tanks, underground pipe chases, and many others in Virginia and several other states.

- Virginia: Developed and implemented closure plan for RCRA hazardous waste storage facility to include sampling plan, decontamination procedures, waste disposal, and QA/QC controls.

- Nationwide: Provide chemical safety and environmental compliance information during implementation of internet-based database Chemical Inventory Management System (CIMS) at NOAA facilities from New Jersey and Florida to California and Alaska.

- Maryland: Performed airport audit and inspection services including law enforcement response records audit, security training records audit, and inspection of airport incident management procedures IAW 49 CFR 1542.

- Michigan: Developed system and wrote proposal for the installation and operation of 1MM gpd underground recovery and treatment system to remove trichloroethylene from ground water. Design and operations were coordinated with state and federal public health and environmental agencies. System met criteria for deadlines, standards and costs.

- New York: Established and operated chemical safety program for 400-man research and development division and 400-man chemical production facility.

- Kansas and Nebraska: Developed procedures, safety and work plans, and coordinated work and training with local and state agencies to download cylinders of chloropicrin grain fumigant and dispose of wastes. Field-produced videos of operations were used training by state fire marshals.

- Virginia: Developed safety plans and managed response crew in removing drums and compressed gas cylinders from debris on remote river banks after major flooding.

- Nationwide: Disassembled and decontaminated numerous perchloric acid-contaminated fume hoods throughout the U.S. for organizations such as the U.S. FDA, Purdue University, Virginia Tech, Procter and Gamble, University of Kansas Medical Center, and many other public and private institutions.

- Virginia and California: Developed safety and work plans and coordinated compliance with local/state agencies for PCB decontamination from working transformer manufacturing facilities.

- Virginia: Developed emergency response action plans and managed response to cylinder of sulfur dioxide abandoned on an interstate highway. Emergency response met local/ state standards for timeliness, effectiveness and safety.

- Virginia: Lead response team in isolating, on-site treatment of residues and decontamination of RCRA-regulated hazard waste storage building after methyl ethyl ketone peroxide (MEKP) explosion at a military facility.

- Washington, D.C.: Disposed of various compressed gases including chlorine dioxide and pentaborane at DoD research facility. Operations met or exceeded safety standards.

- Maryland: Disposed of World War II organophosphate and other insecticides at an agricultural research facility. Work included securing state permits and designing and building portable gas scrubbing system to empty and decontaminate compressed gas cylinders.

- Colorado: Designed and implemented on-site treatment system of organic peroxides in a radiation containment area at U.S. DOE Rocky Flats Environmental Test Facility.

- North Carolina: Designed and implemented system to clear elemental lithium and organo-lithium deposits from nearly 1,700 feet of pipes in commercial production facility. Work was performed in manlifts 30 feet above the floor, in argon-filled glove bags, while wearing aluminized Nomex personal protective equipment.

Explosives and Unexploded Ordnance

- South Carolina: Developed and implemented procedures to open and treat containers of air- and water-reactive materials and unknown explosive products/wastes at the Diversified Explosives (Divex) Superfund site.

- Maryland: Wrote and implemented proposal to identify, transport, and dispose of research-based explosive wastes from ordnance research and development laboratory. Operations included all phases of explosive waste management from worker safety through material identification, RCRA and DOT hazard characterization, and DoD environmental compliance strategies to disposal alternatives and specific facility/disposal process selection.

- Virginia: Provided UXO support to location and recovery of 3.5" rockets, 90 mm and 105 mm gun, 106 mm recoilless rifle casings, 40 mm grenades, and miscellaneous other items.

- South Carolina: Developed plans and led five-man team of retired EOD personnel in search of two Mk-47 depth bombs in 40 feet of water off the former Charleston Naval Shipyard. Techniques used included CHIRP sonar, magnetometry, and open water diving.

- Virginia: Provided UXO clearance at a former landfill at the Naval Surface Warfare Center, Dahlgren Division during remediation and capping.

- Virginia: Wrote safety and operations plans and provided EOD support for UXO identification and recovery from the former Nansemond Ordnance Depot, a Formerly Utilized Defense Site (FUDS). Innovative clearance procedures were developed to clear selected areas at the same quality assurance standards but more rapidly, with significantly reduced costs

- Hawaii: Wrote safety plan and provided EOD support for surface and down-hole unexploded ordnance (UXO) clearance for hydrological study of former impact areas at Schofield Barracks. EOD support included use of data quality objectives for ground water study.

- Maryland: Wrote and implemented proposal to identify, transport and dispose of research-based explosive wastes from ordnance research and development laboratory. Operations included all phases of explosive waste management from worker safety through material identification, RCRA and DOT hazard characterization, and DOD environmental compliance strategies to disposal alternatives and specific facility/disposal process selection.

- Florida: Wrote plans, developed system and supervised crew in the location and recovery of nearly 160,000 hand grenade fuzes and components. Plans included chrome and lead contaminated ground-water and soil management.

- Virginia: Performed a site assessment, then developed UXO safety and work plans to excavate and manage UXO that was found on private property in Chesapeake, VA.

- Elkton, MD: Participated in the pre- and post-award meetings with EPA. Provide on-going UXO quality assurance inspections at an EPA removal action site to ensure compliance with the work plan and standard, accepted UXO industry practices. Also performed field tests to determine the explosive and reactive characteristics of particular materials found on-site.

Training

- Virginia: Conduct monthly HAZWOPER 40-hour and HAZWOPER Refresher training programs at our facility in Chesapeake to a variety of government and commercial students. Also provide DOT HazMat Employee training, hazardous waste training, confined space entry, and others on a monthly, bi-monthly, or quarterly basis.

- Hawaii and Virginia: Developed and taught sampling theory, techniques and regulations classes. The programs were conducted for Navy, DOE, and Army personnel from New Hampshire, Virginia, Idaho, California, and Hawaii, as well as industrial customers. The program included RCRA, TSCA, CWA, and CAA sampling protocols.

- New Jersey: Prepared and presented course on explosive and reactive materials chemistry, identification and emergency destruction to emergency response personnel for U.S. EPA Region III as part of annual HAZWOPER Refresher training program.

- Continental United States: Developed and taught customized confined space entry program for over 200 U.S. Air Force Explosive Ordnance Disposal, firefighters, and fuel-handling personnel at 12 bases.

- Virginia and Georgia: Created and taught customized medical waste management, medical gas safety, and chlorine and sulfur dioxide disinfectant safety and compliance for Moody AFB

  environmental personnel, Ft. Eustis medical and dental, and various commercial construction company personnel.

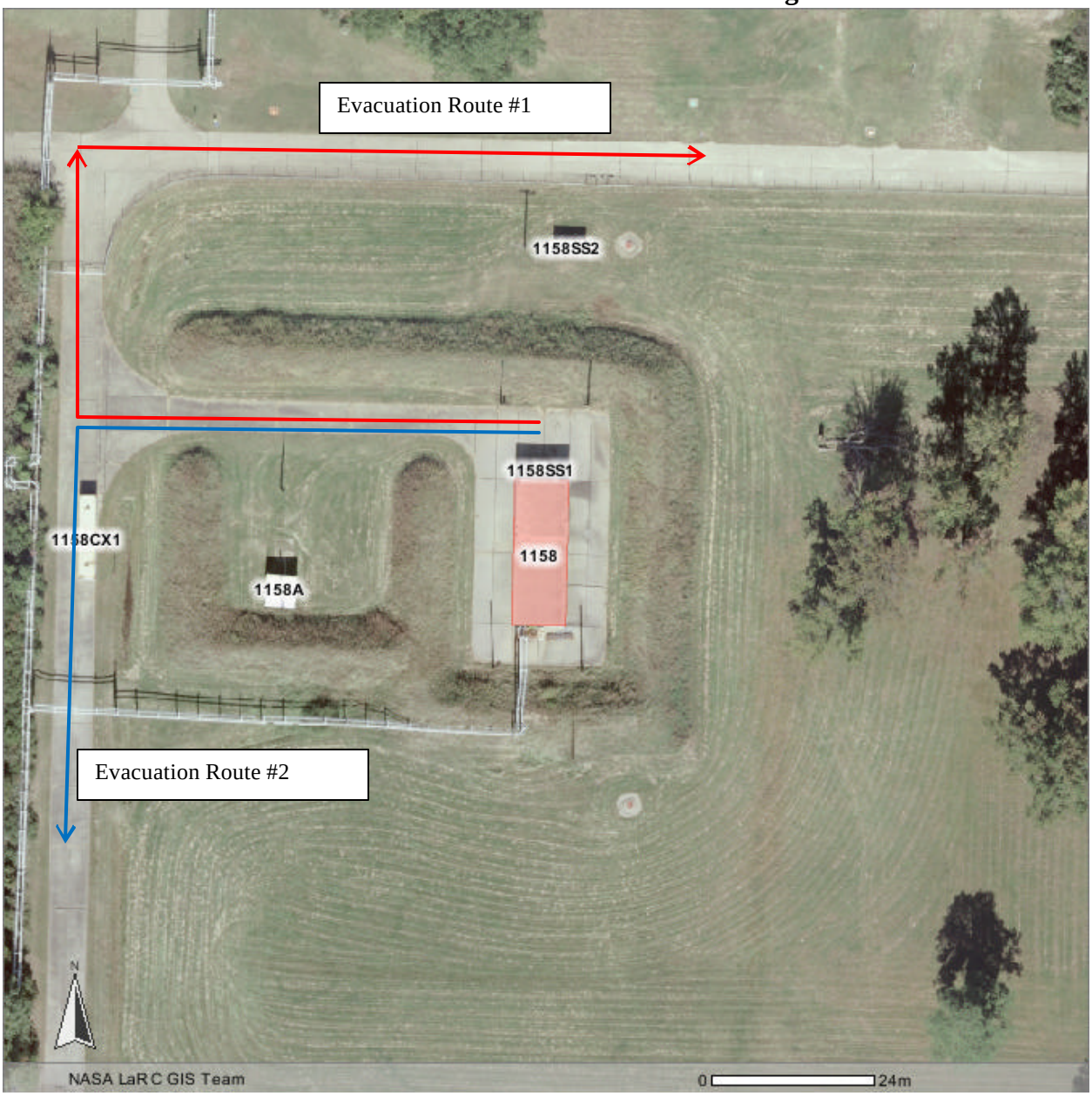
- Virginia: Developed and taught an eight-hour program on explosive recognition, explosive safety, and waste explosive management for universities in the Mid-Atlantic region.

- Washington, DC: Conduct HAZWOPER First Responder Awareness Level, Hazardous Materials Technician, and annual Refresher programs for the Government Printing Office.

- Virginia: Developed and routinely teach explosive user's course at NASA Langley Research Center.

- Maryland: Developed and taught an asbestos awareness program to UXO and other field technicians on a site that was contaminated with both UXO and asbestos.

Attachment 3 — Work Area and Evacuation Routes from Building 1158 & 1158A



Attachment 4 — MSDS for Parlodian and Butylmagnesium Chloride

PARLODION®
MSDS Number: **P0200** * * * * * *Effective Date:* ***07/06/04*** * * * * * *Supercedes:* ***02/12/04***
PARLODION®
1. Product Identification
Synonyms: Pyroxylin Purified Strips
CAS No.: 9004-70-0
Molecular Weight: 504.28
Chemical Formula: C12H16(NO3)4O6
Product Codes: 6552
2. Composition/Information on Ingredients
Ingredient CAS No Percent
Hazardous
--- --- ---

Nitrocellulose 9004-70-0 99%
Yes
Urea 57-13-6 1%
Yes
http://www.jtbaker.com/msds/englishhtml/P0200.htm (1 of 7)11/23/2005 10:33:23 AM
PARLODION®
3. Hazards Identification
Emergency Overview

WARNING! FLAMMABLE SOLID.
SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 3 - Severe (Flammable)
Reactivity Rating: 3 - Severe (Explosive)
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:
No adverse health effects via inhalation. Formation of large quantities of extremely toxic gases, notably oxides of nitrogen, hydrogen cyanide and carbon monoxide may occur upon decomposition. Effects from exposures to decomposition products are severe and life threatening.
Ingestion:
Although ingestion is highly unlikely, swallowing may result in mild stomach upset.
Skin Contact:
Not expected to be a health hazard from skin exposure. May cause mild irritation and redness.
Eye Contact:
Although eye contact is highly unlikely, it may result in severe pain.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.
4. First Aid Measures
Inhalation:
Not expected to require first aid measures. Remove to fresh air. Get medical attention for any breathing difficulty.
Ingestion:
Not expected to require first aid measures. If large amounts were swallowed, give water to drink and getmedical advice.
Skin Contact:
Not expected to require first aid measures. Wash exposed area with soap and water. Get medical advice if irritation develops.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.
http://www.jtbaker.com/msds/englishhtml/P0200.htm (2 of 7)11/23/2005 10:33:23 AM
PARLODION®
5. Fire Fighting Measures
Fire:
Flash point: 13C (55F)
Autoignition temperature: 165C (329F)
Presents an unusually severe fire hazard; when dry, ignites readily and burns explosively. Should never be kept for any appreciable time in any dry fibrous state. Unstabilized product decomposes gradually at relatively low temperature, with evolution of copious volumes of toxic and

flammable gases, and rapid heat generation. The resulting flameless decomposition is self-sustaining and accelerative, presenting the added hazard of dangerous pressures in building structures. This material contains sufficient oxygen to self-sustain burning even in oxygen deficient atmospheres.

Explosion:

For unstabilized, dry material: An explosion may be initiated by sudden shock, by high temperature or by a combination of the two. Sensitive to mechanical impact. Sensitive to static discharge.

Fire Extinguishing Media:

Water spray, dry chemical, alcohol foam, or carbon dioxide.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Use extreme caution in approaching fires. It may explode. Do not fight advanced fires, except for remote activation of installed fire extinguishing equipment and/or with unmanned fixed turrets and hose nozzles. The surrounding area should be evacuated. Fires should be approached from upwind. Use self-contained breathing apparatus. Since cellulose nitrate supplies its own oxygen, prompt cooling with a large quantity of water is essential; water applied through spray nozzles is effective if used quickly and in sufficient volume.

6. Accidental Release Measures

Dangerous material. Partially decomposed material may detonate or autoignite. Handle decomposed material as an explosive that may detonate with mild shock using explosive disposal procedures. Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use nonsparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

7. Handling and Storage

Containers should be protected against damage and not exposed to heating. Storage area should be segregated, well ventilated, and equipped with both decomposition and explosion vents, having the maximum amount of free opening. Protect against excessive heat and direct sunlight, avoid contact with electric light bulbs, steam coils, or other sources of heat; prohibit open flames or other sources of ignition. Control ignition sources. Employ grounding, bonding, venting and explosion relief provisions in accord with accepted engineering practices in any process capable of generating an explosion due to static discharge. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and
http://www.jtbaker.com/msds/englishhtml/P0200.htm (3 of 7)11/23/2005 10:33:23 AM
PARLODION®precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

None established

.
Ventilation System:
In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered. Use explosion-proof equipment.
Personal Respirators (NIOSH Approved):
Not expected to require personal respirator usage.
Skin Protection:
Wear protective gloves and clean body-covering clothing.
Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.
9. Physical and Chemical Properties
Appearance:
Thin, transparent, colorless to pale yellow strips.
Odor:
No information found.
Solubility:
Insoluble in water.
Specific Gravity:
1.66 @ 20C/4C
pH:
No information found.
% Volatiles by volume @ 21C (70F):
0
Boiling Point:
No information found.
Melting Point:
165C (329F) Ignites
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
Not applicable.
10. Stability and Reactivity

PARLODION®
Stability:
Stable at room temperature in sealed containers. For unstabilized, dry material: An explosion may be initiated by sudden shock, by high temperature or by a combination of the two. Heat and sunlight can contribute to instability.

Hazardous Decomposition Products:
Emits toxic fumes of hydrogen cyanide, nitric oxides, and carbon monoxide when heated to decomposition.
Incomplete combustion may generate toxic hydrogen cyanide fumes.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong oxidizers.
Conditions to Avoid:
Heat, flame, sources of ignition, light and incompatibles.
11. Toxicological Information
Oral rat LD50: > 5gm/kg
--------\Cancer Lists\----------
---NTP Carcinogen---
Ingredient Known Anticipated IARC Category
---------- ----- ---------- ----------
Nitrocellulose (9004-70-0) No No None
Urea (57-13-6) No No None
12. Ecological Information
Environmental Fate:
No information found.
Environmental Toxicity:
No information found.
13. Disposal Considerations
Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.
14. Transport Information
http://www.jtbaker.com/msds/englishhtml/P0200.htm (5 of 7)11/23/2005 10:33:23 AM
PARLODION®
Domestic (Land, D.O.T.)

Proper Shipping Name: NITROCELLULOSE (WITH NOT MORE THAN 12.6 PERCENT NITROGEN, BY
DRY MASS)
Hazard Class: 4.1
UN/NA: UN2557
Packing Group: II
Information reported for product/size: 500G

International (Water, I.M.O.)

Proper Shipping Name: NITROCELLULOSE (WITH NOT MORE THAN 12.6 PERCENT NITROGEN, BY
DRY MASS)
Hazard Class: 4.1
UN/NA: UN2557
Packing Group: II
Information reported for product/size: 500G
15. Regulatory Information
--------\Chemical Inventory Status - Part 1\----------
Ingredient TSCA EC Japan Australia
--- --- --- --- ---
Nitrocellulose (9004-70-0) Yes No Yes
Yes
Urea (57-13-6) Yes Yes Yes
Yes
--------\Chemical Inventory Status - Part 2\----------
--Canada--
Ingredient Korea DSL NDSL Phil.
--- --- --- --- ---
Nitrocellulose (9004-70-0) Yes Yes No Yes
Urea (57-13-6) Yes Yes No
Yes
--------\Federal, State & International Regulations - Part 1\----------
-SARA 302- ------SARA 313------
Ingredient RQ TPQ List Chemical Catg.
--- --- --- ---
Nitrocellulose (9004-70-0) No No No No
Urea (57-13-6) No No No No
--------\Federal, State & International Regulations - Part 2\----------
-RCRA- -TSCAIngredient
CERCLA 261.33 8(d)
--- --- ---
Nitrocellulose (9004-70-0) No No No
Urea (57-13-6) No No
http://www.jtbaker.com/msds/englishhtml/P0200.htm (6 of 7)11/23/2005 10:33:23 AM
PARLODION®
No
Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: No Chronic: No Fire: Yes Pressure: No

Reactivity: Yes (Mixture / Solid)
Australian Hazchem Code: 2[Y]
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.
16. Other Information
NFPA Ratings: Health: **0** Flammability: **3** Reactivity: **3**
Label Hazard Warning:
WARNING! FLAMMABLE SOLID.
Label Precautions:
Keep away from heat, sparks and flame.
Label First Aid:
Not applicable.

Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 3.
Disclaimer:
****
Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.
****
Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

Material Safety Data Sheet
tert-Butylmagnesium chloride, 20 wt% solution in THF

ACC# 99643

Section 1 - Chemical Product and Company Identification

MSDS Name: tert-Butylmagnesium chloride, 20 wt% solution in THF
Catalog Numbers: AC331670000, AC331671000
Synonyms:
Company Identification:
Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410
For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
109-99-9	Tetrahydrofuran	80	203-726-8
677-22-5	tert-Butylmagnesium chloride	20	211-638-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Not available. Flash Point: -21 deg C.
Air sensitive. Moisture sensitive.
Target Organs: None known.

Potential Health Effects

Eye: Causes eye burns.
Skin: Causes skin burns.
Ingestion: Harmful if swallowed. Causes gastrointestinal tract burns. May cause effects similar to those for inhalation exposure.

Inhalation: Causes chemical burns to the respiratory tract. May cause narcotic effects in high concentration. May cause dizziness, incoordination, and unconsciousness. May cause headache. May cause nausea, dizziness, and headache. May cause respiratory difficulty and coughing.
Chronic: Not available.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.
Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors can travel to a source of ignition and flash back. Containers may explode in the heat of a fire. Water reactive. Flammable liquid and vapor. May form explosive peroxides.
Extinguishing Media: Use dry chemical to fight fire. DO NOT USE WATER!
Flash Point: -21 deg C (-5.80 deg F)
Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.

Upper: Not available.
NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Use a spark-proof tool.

Section 7 - Handling and Storage

Handling: Use spark-proof tools and explosion proof equipment. Do not breathe dust, mist, or vapor. Do not get in eyes, on skin, or on clothing. Use only in a chemical fume hood.
Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Keep under a nitrogen blanket. Flammables-area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Tetrahydrofuran	50 ppm TWA; 100 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous r oute	200 ppm TWA; 590 mg/m3 TWA 2000 ppm IDLH (10% LEL)	200 ppm TWA; 590 mg/m3 TWA
tert-Butylmagnesium chloride	none listed	none listed	none listed

OSHA Vacated PELs: Tetrahydrofuran: 200 ppm TWA; 590 mg/m3 TWA tert-Butylmagnesium chloride: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Not available.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: Not available.
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Not available.
Specific Gravity/Density:.9310g/cm3
Molecular Formula:(CH3)3CMgCl
Molecular Weight:116.87

Section 10 - Stability and Reactivity

Chemical Stability: Not available.
Conditions to Avoid: Incompatible materials, ignition sources, exposure to air, exposure to moist air or water.
Incompatibilities with Other Materials: Oxidizing agents, acids, alcohols, potassium hydroxide, bromine, metal halides.

Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 109-99-9: LU5950000
CAS# 677-22-5 unlisted.
LD50/LC50:
CAS# 109-99-9:
Inhalation, rat: LC50 = 21000 ppm/3H;
Oral, rat: LD50 = 1650 mg/kg;
CAS# 677-22-5:

Carcinogenicity:
CAS# 109-99-9:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

CAS# 677-22-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 109-99-9: waste number U213 (Ignitable waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE	FLAMMABLE LIQUID CORROSIVE NOS (TERT.-BUTYLMAGNESIUM CHLORID)
Hazard Class:	4.3	3(8)
UN Number:	UN3399	UN2924
Packing Group:	I	II

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 109-99-9 is listed on the TSCA inventory.
CAS# 677-22-5 is not listed on the TSCA inventory. It is for research and development use only.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules
CAS# 109-99-9: 40 CFR 799.5000; 40 CFR 799.5115
Section 12b
CAS# 109-99-9: Section 4, 1 % de minimus concentration
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 109-99-9: 1000 lb final RQ; 454 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 109-99-9: immediate, fire, reactive.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants

This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 109-99-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 677-22-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:
F C
Risk Phrases:
R 11 Highly flammable.

R 14 Reacts violently with water.
R 19 May form explosive peroxides.
R 34 Causes burns.

Safety Phrases:
S 16 Keep away from sources of ignition - No smoking.
S 29 Do not empty into drains.
S 33 Take precautionary measures against static discharges.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

WGK (Water Danger/Protection)
CAS# 109-99-9: 1
CAS# 677-22-5: No information available.

Canada - DSL/NDSL
CAS# 109-99-9 is listed on Canada's DSL List.

Canada - WHMIS
This product has a WHMIS classification of B2, E.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List
CAS# 109-99-9 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 7/01/1998
Revision #5 Date: 11/20/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.