Hydrazine Fire Response

Lake, MS

Waste Management Plan

Version 1.0

Prepared On Behalf Of:

UNITED STATES ENVIRONMENTAL SERVICES
Industrial | Response & Remediation | Maritime

Prepared By:

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December 16, 2014

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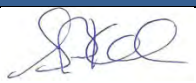
Prepared by:	Waste Mgt. / Scott Kluska		12/16/14
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1.0 INTRODUCTION

The purpose of this document is to describe the plan for management of waste streams generated as a result of site mitigation for the Hydrazine Fire response. Center for Toxicology & Environmental Health (CTEH®) has been retained to provide services which include but not limited to assisting with management of identifying and mitigation of any and all potential environmental impacts; community air monitoring; identify, characterize and disposal of all waste generated as a result of the roadside event in Lake, MS which occurred on December 15, 2014.

This site-specific Waste Management Plan (WMP) describes the specific work tasks that are associated with the management of the waste listed at the site for the duration of this project. The plan outlines the basic tasks and establishes engineering controls that will be implemented to minimize risk to field personnel, the general public and the environment.

A separate Health & Safety Plan (HASP) will be amended, as necessary, if additional project tasks or hazards are identified during the scope of this project. CTEH® has developed this WMP in accordance with the regulations presented in the United States Environmental Protection Agency (USEPA), United States Department of Transportation, (USDOT) and Mississippi Department of Environmental Quality regulations.

2.0 SITE DESCRIPTION

The Hydrazine Fire project site is located at approximately MM 95 on Interstate 20 eastbound in Lake, MS, 39092.

On Monday, December 15, 2014, a fire occurred at the roadside location listed above. Onsite and possibly offsite areas were impacted by the fire and product / firefighting liquids/foam runoff and will result in collection of materials for disposal.

A site diagram, which shows the location of the release, is attached.

3.0 WASTE MANAGEMENT PLAN

3.1 GENERAL WASTE MANAGEMENT BEST PRACTICES

The following best practices must be followed in the management of wastes generated in a spill response effort:

A. Dispose or manage wastes and recoverable materials in permitted or otherwise authorized locations and facilities only. Unauthorized disposal or management will not be tolerated.
B. Reduce waste generation whenever practical. This is known as waste minimization or pollution prevention.
C. Reuse or recycle materials whenever practical. This not only lowers consumption of raw materials; it also eliminates the need for waste disposal. Recycling and reuse of recovered oil and oily water is the preferred option.
D. Avoid co-mingling wastes of different classifications. For example, never place non-hazardous wastes in the same container as hazardous waste. In addition, keep recyclable material separate from non-recyclable waste. It may be difficult or impossible to separate wastes after they are co-mingled.
E. Maintain good housekeeping practices. Employees and contractors should maintain neat, clean work areas to reduce the need for additional clean up and the associated waste.
F. Properly store wastes, especially hazardous wastes, to avoid releases to soil, water, or air, until they can be appropriately managed.
G. Clearly identify waste containers. Use a label or other means to clearly identify the contents of containers of hazardous, non-hazardous and inert wastes.
H. Document quantities and disposition of all hazardous and non-hazardous wastes as instructed in this plan. Waste tracking can help to manage costs and is required for all hazardous wastes. This information will be included in the final report developed at the conclusion of response activities.
I. Recovered liquids (oil, water, sludge) should be collected and stored in as large a container as possible (USDOT approved drum, tote tank, tanker truck, barge, etc.) to maximize decanting potential, facilitate uninterrupted recovery, and to minimize equipment decontamination requirements.
J. Communicate your ideas for waste minimization or waste management improvements to supervisors and fellow employees in different areas.
K. Maintain security at all sites where waste is held.

WASTE ANALYSIS & PROFILING:

All waste must be evaluated, characterized, profiled, and approved prior to being shipped off-site; this requirement applies to both RCRA Hazardous and RCRA non-hazardous waste. Currently, Hydrazine and Platinum "AR AFFF 3%-6%" alcohol resistant firefighting foam are the primary source of contamination for this project. The Incident Command Structure (ICS) group will advise the project management staff, first responders, hazardous materials technicians, operators, and ancillary personnel as to the specific hazards associated with the materials that may have to be managed as well as provide handling instructions of material being managed, specifically, as waste.

All materials may be evaluated utilizing generator knowledge, visual inspection, field test strips and laboratory analyses as required. Upon review of this information, waste management/ remedial personnel will begin to sort and separate the material into the appropriate category, according to USEPA 40 CFR 261 if it be hazardous waste, non-hazardous waste, or off-spec and/or unused product. At this point the material will be containerized as is necessary and practical. Once separated and containerized, the formal waste characterization process will begin. Based on the advisement of the generator, technical staff, and onsite personnel, the appropriate disposal facility will be chosen and their respective waste analysis and sampling requirements will be followed.

ANTIPICATED WASTE TYPES:

At this time, the following are the anticipated waste streams from the Hydrazine Fire site based on information from the generator and emergency response personnel. This list shall not be considered inclusive and is subject to change as onsite personnel analyze the true extent of impact and remedial requirements:

1. Solids (debris from trailer contents, soil, PPE, vegetation, etc.) mitigation

3.2 WASTE STREAM IDENTIFICATION AND COLLECTION

The Incident Management Team (IMT) will have personnel on site at the generation point tracking all waste streams accumulated and transported to the designated final disposal site for the specific waste type. The IMT will implement a tracking system and method for onsite crews to properly segregate waste streams at the point of generation prior to removal. The subject methods include using designated minimum 6mm bags or sheeting as needed for segregated waste. IMT personnel onsite at the generation point will provide waste tracking logs to Waste Management personnel so that proper space is made available on the receiving waste transport for acceptance of the waste generated.

DECONTAMINATION LIQUID WASTE

Liquid decontamination waste (equipment cleaning water, etc.) recovery from the relevant operations will be solidified in with the soil and other solid wastes and managed with the solid wastes.

SOLID WASTE

Solid waste (ground deposited solid materials, solidified liquids and semi-solids, etc.) generated from response efforts will be addressed in the following method:

DIRECT LOAD-OUT IN THE FIELD

A. All roll-off containers used are to be lined with impermeable sheeting prior to loading.
B. Field personnel will load bulk solids directly into lined roll-off containers at point of generation.
C. Roll-off containers will be transferred to the onsite staging area to await offsite disposal.
D. All roll-off containers will be covered with tarps during storage and transportation.

All approved waste containers will be labeled in accordance with state and federal transport regulations.

3.3 WASTE TRACKING AND DOCUMENTATION

The generation and tracking of the waste will be documented by several means as needed:

1. Waste Tracking Sheet – a waste tracking sheet will be utilized to track the quantity, location and disposition of the various waste streams generated.
2. Hazardous Waste Manifests – a hazardous waste manifest will be utilized for the off-site shipment of any hazardous waste generated.
3. Bill of Lading / Non-Hazardous Waste Manifest – a Bill of Lading or Non-Hazardous Manifest will be used for off-site shipment of non-hazardous or non-regulated waste generated.

3.4 ANALYTICAL/APPROVAL PROCESS

A representative sample will be taken and sent to the disposal facility for waste profile approval. Based on Generator knowledge and the provision of the Safety Data Sheets (SDS) for the 35% Hydrazine Solution and the Platinum “AR AFFF 3%-6%” alcohol resistant firefighting foam, no laboratory analyses is needed for characterization of this waste.

WASTE CHARACTERIZATION / PROFILING SAMPLING FREQUENCY

The following is an outline of the frequency of sampling to characterize the wastes generated. This is strictly for Waste Profiling.

Bulk Solid Wastes (Soil, Solidified Materials, Debris, Absorbents, etc.):

Rolloff Containers:
1 composite sample for every rolloff containers. The composite sample will be comprised of 2-3 discreet samples from each rolloff and combined into the composite sample. Rolloff composites may be combined into one single profile sample.

3.5 WASTE STORAGE, TRANSPORTATION & DISPOSAL

ANTICIPATED WASTE CONTAINERS:

Based on the anticipated waste streams mentioned previously, the follow are the anticipated waste containers to be utilized at the site. This list shall not be considered all-inclusive and is subject to change based on field requirements:

Roll-off containers – (debris from trailer contents, soil, PPE, vegetation, etc.)

TRANSPORTERS:

The following is a list of licensed transporters that may be utilized to transport materials from the Hydrazine Fire site to approved treatment, disposal, and storage facilities. This list shall not be deemed inclusive and may change as onsite personnel obtain more information:

Complete List of Transporters to be Determined.

Waste Management – Emelle Landfill
36964 Alabama Highway 17 North
Emelle, AL 35459
(800) 963-4776
EPA ID No.: ALD000622464
Hazardous Waste Transport: ALD000622464
Service Offering: Vacuum Tanker, roll-off, dump trailers, etc.

EQ Industrial Services
26705 Northline Road
Taylor, MI 48180
(734) 941-4357
Hazardous Waste Transport: MI0000263871 (transportation)
Service Offering: Vacuum Tanker, roll-off, dump trailers, etc.

DISPOSAL FACILITIES:

The following are a list of possible / anticipated waste disposal facilities that may be utilized to handle material generated at the Hydrazine Fire site. This list shall not be deemed inclusive and is subject to change based on site observations and material generated:

Waste Management – Emelle Landfill
36964 Alabama Highway 17 North
Emelle, AL 35459
(800) 963-4776
EPA ID #: ALD000622464
Hazardous Waste Transport: ALD000622464
Service Offering: Landfill, Treatment, Stabilization, etc.

EQ / US Ecology – Michigan Disposal
49350 North I-94 Service Drive
Belleville, MI 48111
(800) 592-5489
EPA ID #: MID000724831
Service Offering: Landfill, Treatment, Stabilization, etc.

WASTE DOCUMENTATION:

The following are documents planned to be utilized for the proper waste characterization and shipping / disposal:

1) Waste Profile
2) Uniform Hazardous Waste Manifest

3.6 RECORD KEEPING

CONTAINER LOG

A container log may be developed to track characterization activities for each container assigned an identification number. An electronic version of the form will be updated daily and will serve as the master copy. Separate container log forms will be kept for each area.

DAILY REPORT

A daily report by the professional managing data collection may be prepared following each work day. The report will identify active subcontractors and a summary of work conducted during the day.

MANIFESTS

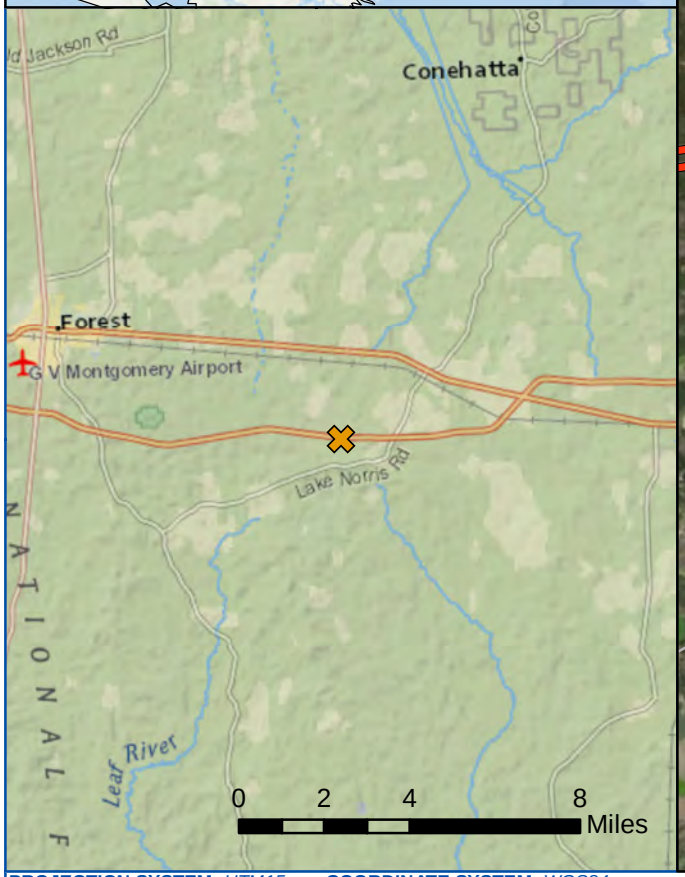
CTEH® will manage all manifests for the site. The manifest number will be identified on the Container log when appropriate.

SITE DIAGRAM

Lake, MS - Hydrazine Release

Site Location

Project: 106883
Client: USES
City: Lake, MS
County: Scott



PROJECTION SYSTEM: *UTM15* **COORDINATE SYSTEM:** *WGS84* **LAST UPDATED:** *12/16/2014 1:07:14 AM*

SAFETY DATA SHEETS

FOAM CONCENTRATES

BFC - 36.1 PLATINUM AR-AFFF 3%-6% ALCOHOL RESISTANT AQUEOUS FILM FORMING FOAM CONCENTRATE (3%-6% AR-AFFF)

DESCRIPTION

Buckeye Platinum 3%-6% AR-AFFF is an Earth Friendly advanced totally synthetic blend of surfactants and special polymers. It is designed to form a vapor suppressing aqueous film on Class B Hydrocarbon type fuels or a polymeric membrane on polar solvent/water miscible type fuels. It is intended for use at a proportioning rate of 3% (3 parts AR-AFFF concentrate to 97 parts water) on Class B Hydrocarbon fuels such as gasoline, kerosene and diesel. Buckeye Platinum 3%-6% AR-AFFF is intended for use at a 6% proportioning rate (6 parts AR-AFFF concentrate to 94 parts water) on polar solvent/ water miscible fuels such as alcohols, ketones and esters.

FEATURES

- U. L. Listed.
- Suitable for use with either fresh or salt water.
- Excellent wetting characteristics when used in combating Class A fires.
- Suitable for use with Deluge and Closed-Head Foam Water Sprinkler systems.
- Suitable for use with fiberglass, polyethylene or stainless steel. Buckeye Platinum 3%-6% AR-AFFF is not compatible with galvanized pipe or fittings in an undiluted form.
- Suitable for use with dry chemical extinguishing agents.
- Suitable for use on Class B Hydrocarbon or polar solvent type fuels.
- Suitable for use with both air-aspirating foam and standard water fog nozzles.

PROPORTIONING

Buckeye Platinum 3%-6% AR-AFFF is designed for use with the following types of proportioning equipment.

- Fixed or portable in-line eductors.
- In-Line Balanced Pressure (ILBP) Pump Pressure proportioning skid.
- Bladder tank Balanced Pressure proportioning systems.
- Around-the-Pump proportioners.
- Handline, air-aspirating nozzles with fixed eductor pickup tube.

DISCHARGE DEVICES

Buckeye Platinum 3%-6% AR-AFFF is suitable for use with the following discharge devices.

- Foam Chambers.
- Air-aspirating and non air-aspirating sprinklers or spray nozzles.
- Standard water fog nozzles for handlines and monitors.
- Air-aspirating foam nozzles.
- Foam makers for use with either Floating Roof storage tanks or Dike/Bund protection systems.
- High Back Pressure Foam Makers for subsurface base injection system (Class B Hydrocarbon type fuels only.)

FOAMING PROPERTIES

Aspirating type discharge devices typically generate expansion ratios between 2-10 to 1 when Platinum 3%-6% AR-AFFF is mixed with water at the correct ratio. Non-aspirating type devices will typically generate expansion ratios of between 2-4 to 1. Expansion ratios are dictated by the type of discharge device, flow rate and discharge pressure.

DESIGN INFORMATION

Cannot be used in subsurface applications with polar solvent type fuels.

TYPICAL PROPERTIES AT 77°F (25°C)

Appearance	Viscous light tan
Specific gravity	1.000 - 1.040
pH	7.0 - 8.0
Viscosity	1200 - 1800 cps

APPLICATION RATES

Recommend application rate on Class B Hydrocarbon type fuels is 0.10 gpm/sq. ft. and on polar solvent type fuels is 0.15 gpm/sq. ft. The recommended minimum application rates for the following specific polar solvent type fuels are:

IPA	0.15 gpm/sq. ft.
METHANOL	0.10 gpm/sq. ft.
ETHANOL	0.10 gpm/sq. ft.
ACETONE	0.14 gpm/sq. ft.
METHYL ETHYL KETONE	0.10 gpm/sq. ft.
ETHYL ACETATE	0.10 gpm/sq. ft.
MTBE	0.15 gpm/sq. ft.

ENVIRONMENTAL IMPACT

Buckeye Platinum 3%-6% AR-AFFF is biodegradable, low in toxicity and can be treated in sewage treatment plants. Refer to Buckeye Technical Bulletin regarding foam products and the environment.

STORAGE

If kept in the original manufacturer's supplied container and stored within the temperature range of 35°F - 120°F (2°C - 49°C), a shelf life of between 20-25 years can be expected. If the AR-AFFF is to be stored in an atmospheric type foam concentrate storage tank, whether on mobile apparatus or stationary, limit the air space above the surface of the concentrate where possible and place a thin layer of quality mineral oil on the surface of the foam concentrate to minimize any effect from evaporation.

ORDERING INFORMATION

Buckeye Platinum 3%-6% AR-AFFF is available in 5 gallon plastic pails, 55 gallon plastic drums, 275 gallon plastic totes or can be shipped in bulk.

Part No. 50385	5 Gal. Pail (19 L)
Part No. 50370	55 Gal. Drum (209 L)
Part No. 50375	275 Gal. Tote (1042 L)

SHIPPING WEIGHT

5 Gal. Pail	44 lbs.
55 Gal. Drum	485 lbs.
275 Gal. Tote	2485 lbs.

FOR ANY EMERGENCY, 24 HOURS / 7 DAYS, CALL:	1-800-654-6911 (OUTSIDE USA: 1-423-780-2970)
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC®:	1-800-424-9300 (OUTSIDE USA: 1-703-527-3887)
FOR ALL MSDS QUESTIONS & REQUESTS, CALL:	1-800-511-MSDS (OUTSIDE USA: 1-423-780-2347)

PRODUCT NAME: **35% HYDRAZINE SOLUTION**

1. PRODUCT AND COMPANY IDENTIFICATION

Arch Chemicals, Inc.
501 Merritt 7 PO Box 5204
Norwalk, CT 06856-5204

REVISION DATE:	12/15/2011
SUPERCEDES:	01/26/2010
MSDS Number:	000000000376
SYNONYMS:	Hydrazine hydrate
CHEMICAL FAMILY:	Hydrazine
DESCRIPTION / USE	Corrosion inhibitor for boilers
FORMULA:	N2H4

2. HAZARDS IDENTIFICATION

OSHA Hazard Classification:	**Toxic by ingestion, dermal contact, and inhalation, Possible carcinogen., Eye, skin and respiratory irritant, Skin sensitizer, Lung, liver, kidney and nervous system toxin**

Routes of Entry:	Inhalation, skin, eyes, ingestion
Chemical Interactions:	No known or reported interactions.
Medical Conditions Aggravated:	Liver, kidney, respiratory and central nervous system disorders

Human Threshold Response Data

Odor Threshold
HYDRAZINE 3.7 ppm

Irritation Threshold
HYDRAZINE Not established.

Hazardous Materials Identification System / National Fire Protection Association Classifications

Hazard Ratings :	Health	Flammability	Physical / Instability	PPI / Special hazard.
HMIS	2*	0	0	
NFPA	2	0	0	

Immediate (Acute) Health Effects

Inhalation Toxicity:	Toxic by inhalation. High concentrations are moderately irritating to the eyes, nose, throat, and lungs. This product is rapidly absorbed through the lungs. Immediate and prolonged contact may result in the following: damage to the liver and kidneys with symptoms of vomiting, diarrhea, nausea, dizziness and convulsions.
Skin Toxicity:	Toxic if absorbed through the skin. Skin contact may cause moderate irritation consisting of transient redness and swelling. This irritant effect would not be expected to result in permanent damage. Dermal contact may cause defatting of skin and/or dermatitis. This product is rapidly absorbed through the skin, and may result in the following: damage to the liver and kidneys with symptoms of vomiting, diarrhea, nausea, dizziness and convulsions.
Eye Toxicity:	Contact may cause moderate irritation consisting of transient redness, swelling, and mucous membrane discharge to the conjunctiva. No corneal involvement or visual impairment is expected.
Ingestion Toxicity:	Toxic if swallowed. Ingestion may cause severe irritation of the gastrointestinal tract and may also cause gastrointestinal discomfort with any or all of the following symptoms: nausea, vomiting or diarrhea. This product is rapidly absorbed through the lungs. Immediate and prolonged contact may result in the following: damage to the liver and kidneys with symptoms of vomiting, diarrhea, nausea, dizziness and convulsions.
Acute Target Organ Toxicity:	May cause skin, eye and mucous membrane irritation (includes upper respiratory tract). Ingestion may cause gastrointestinal discomfort., Damage occurs to liver, kidney, central nervous system, and lungs.

Prolonged (Chronic) Health Effects

Carcinogenicity:	The International Agency for Research on Cancer (IARC) has classified this product or a component of this product as a Group 2B substance, Possibly Carcinogenic to Humans.
Reproductive and Developmental Toxicity:	Reproductive and/or developmental toxicity was observed in laboratory animals only at high doses that were maternally toxic.
Inhalation:	Prolonged or repeated exposure may cause continuous bronchitis.
Skin Contact:	Prolonged or repeated exposure may cause severe irritation. Dermal contact may cause defatting of skin and/or dermatitis.
Skin Absorption:	Prolonged or repeated exposure, may result in toxic amounts being absorbed through the skin.

Ingestion:	Chronic ingestion of this product may cause severe irritation and possible corrosive effects.
Sensitization:	May cause allergic skin sensitization in some individuals.
Chronic Target Organ Toxicity:	Liver, Kidneys, Lungs, Central nervous system
Supplemental Health Hazard Information :	No additional health information available.

3. COMPOSITION / INFORMATION ON INGREDIENTS

CAS OR CHEMICAL NAME	CAS #	% RANGE
HYDRAZINE	302-01-2	30 - 40

4. FIRST AID MEASURES

Inhalation:	IF INHALED: Remove individual to fresh air. Seek medical attention if breathing becomes difficult or if respiratory irritation develops. If not breathing, give artificial respiration. Call for medical assistance.
Skin Contact:	IF ON SKIN: Immediately flush skin with plenty of water for 15 minutes. If clothing comes in contact with the product, the clothing should be removed immediately and disposed of. Call a physician.
Eye Contact:	IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention immediately.
Ingestion:	IF SWALLOWED: Call a physician immediately. DO NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person.
Notes to Physician:	Pyridoxine (Vitamin B6) has been used successfully to treat the neurological symptoms of hydrazine exposure.

5. FIRE FIGHTING MEASURES

Flammability Summary (OSHA):	Product is not known to be flammable, combustible, pyrophoric or explosive.
Flammable Properties	
Flash Point:	Material is water-based and will not flash.
Autoignition Temperature:	Not applicable
Fire / Explosion Hazards:	Material will not ignite or burn.

Extinguishing Media:	Water is the preferred extinguishing media as it will dilute the material resulting in a non-flammable mixture. Use alcohol resistant foam, carbon dioxide, dry chemical, or vaporizing liquid extinguishing agents. Water spray or fog may also be effective for extinguishing or to absorb heat and keep exposed material from being damaged by fire.
Fire Fighting Instructions:	Response to this material requires the use of a full encapsulated suit and full-face (NIOSH approved) self-contained breathing apparatus (SCBA). Use water to cool containers.
Hazardous Combustion Products:	Ammonia, Hydrogen
Upper Flammable / Explosive Limit, % in air:	Not applicable
Lower Flammable / Explosive Limit, % in air:	Not applicable

6. ACCIDENTAL RELEASE MEASURES

Personal Protection for Emergency Situations:	Response to this material requires the use of a full encapsulated suit and full-face (NIOSH approved) self-contained breathing apparatus (SCBA).
<u>Spill Mitigation Procedures</u>	
Air Release:	Vapors may be suppressed by the use of water fog. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.
Water Release:	This material is heavier than water. This material is miscible in water. Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so.
Land Release:	Dike spill area as soon as possible. Dilute the spilled material to about 10% with water. Neutralize the diluted material by slowly adding a 5-8% calcium hypochlorite solution until all the diluted material has been reacted. DO NOT ADD DRY CALCIUM HYPOCHLORITE TO THE SPILL AS A VIOLENT REACTION MAY RESULT. If unable to remove as a liquid, absorb in clay, sand or a commercial absorbent. Do not place spill materials back in their original containers. This substance cannot be removed from leather. All contaminated leather articles should be rinsed with water and discarded.

Additional Spill Information :	If this material is released into a work area, evacuate the area immediately. Hazardous concentrations in air may be found in local spill area and immediately downwind. Utilize emergency response personal protection equipment prior to the start of any response. Stop source of spill as soon as possible and notify appropriate personnel. This material may be neutralized for disposal; you are requested to contact Arch Chemicals at 1-800-654-6911 before beginning any such procedure. Containerize and label properly and remove to a secure location for proper disposal. Decontaminate all clothing and the spill area using a detergent and flush with large amounts of water.

7. HANDLING AND STORAGE

Handling:	Avoid contact with material, avoid breathing vapors, use only in a well ventilated area, use bonding and grounding when transferring quantities of material. Do not take internally. Avoid contact with eyes, skin, and clothing. Upon contact with skin or eyes, wash off with water.
Storage:	Store in a cool dry ventilated location, away from sources of ignition or other incompatible conditions and chemicals. Keep container(s) closed. Avoid direct exposure to sunlight or ultraviolet (UV) light sources. Keep under a nitrogen blanket.
Shelf Life Limitations:	5 Years if not opened and exposed to the atmosphere. Material older than five years should be retested before use.
Incompatible Materials for Storage:	Strong oxidizing agents metal oxides organic materials with high surface area such as rags, cotton waste, sawdust, etc. peroxides
Do Not Store At temperatures Above:	51 DEG°C / 123 DEG°F

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation:	Local exhaust ventilation or other engineering controls are normally required when handling or using this product to keep airborne exposures below the TLV, PEL or other recommended exposure limit.

Protective Equipment for Routine Use of Product

Respiratory Protection :	Wear a NIOSH approved respirator if any exposure occurs.
Respirator Type :	NIOSH approved positive pressure supplied air respirator.
Skin Protection :	Wear impervious gloves, boots and apron to avoid skin contact. A full impervious suit is recommended if exposure is possible to a large portion of the body. A safety shower should be provided in the immediate work area.

Eye Protection:	Use chemical goggles and a faceshield. Emergency eyewash should be provided in the immediate work area.
Protective Clothing Type:	Butyl rubber, Nitrile, Neoprene

Exposure Limit Data

CHEMICAL NAME	CAS #	Name of Limit	Exposure
HYDRAZINE	302-01-2	ACGIH	0.01 ppm TWA
HYDRAZINE	302-01-2	OSHA Z1	1 ppm TWA 1.3 mg/m3 TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	liquid
Form	clear, liquid
Color:	colorless
Odor:	Ammonia
Molecular Weight:	32.04
Specific Gravity :	1.0270
pH :	10.1 - 10.7 (1% solution in neutral, distilled water)
Boiling Point:	109 DEG°C / 228 DEG°F
Freezing Point:	-65 DEG°C / -85 DEG°F
Melting Point:	No data
Density:	1.0270g/cc
Vapor Pressure:	22.00000000 mmHg (total pressure) (@ 30 Deg. C)
Vapor Density:	No data
Viscosity:	No data
Fat Solubility:	No data
Solubility in Water:	Completely miscible
Partition coefficient n-octanol/water:	No data
Evaporation Rate:	No data
Oxidizing:	No data
Volatiles, % by vol.:	100.000%
VOC Content	No data
HAP Content	No data

10. STABILITY AND REACTIVITY

Stability and Reactivity Summary:	Corrosive. Strong reducing agent. May become unstable at elevated temperatures and/or pressure. Not sensitive to mechanical shock. Product will not undergo hazardous polymerization.
Conditions to Avoid:	Temperatures above the flash point in combination with sparks, open flames, or other sources of ignition., Avoid contact with organic materials.
Chemical Incompatibility:	Strong oxidizing agents, peroxides, nitrogen tetroxide, fuming nitric acid, fluorine, halogen fluorides, metal oxides such as those of iron, copper, lead, manganese, and molybdenum, Package only in Teflon® high density polyethylene or 304L or 347 stainless steels containing less than 0.5% molybdenum.
Hazardous Decomposition Products:	Ammonia, Hydrogen
Decomposition Temperature:	> 250 DEG°C - , > 482 DEG°F-

11. TOXICOLOGICAL INFORMATION

Component Animal Toxicology
Oral LD50 value:

HYDRAZINE	LD50	60 mg/kg	Rat

Component Animal Toxicology
Dermal LD50 value:

HYDRAZINE	LD50	91 mg/kg	Rabbit

Component Animal Toxicology
Inhalation LC50 value:

HYDRAZINE	Inhalation LC50	4.00 h	570 ppm	Rat
HYDRAZINE	Inhalation LC50	1 h	1.49 MG/L	Rat
HYDRAZINE	Inhalation LC50	4.00 h	0.747 MG/L	Rat

Product Animal Toxicity

Oral LD50 value:	LD50	=	185 mg/kg	Rat			
Dermal LD50 value:	LD50	=	420 mg/kg	Rabbit			
Inhalation LC50 value:	Inhalation LC50	1 h	(aerosol), (Nose Only)	Approximately	7.7 MG/L	Rat	
	Inhalation LC50	4 h	(aerosol), (Nose Only)	Approximately	1.9 MG/L	Rat	

Skin Irritation: This material is expected to be moderately irritating.
Eye Irritation: This material is expected to be moderately irritating.

Skin Sensitization:	Positive skin sensitizer, guinea pig - Buehler Method, This material tested positive for skin sensitization in humans., Repeated or prolonged skin contact may cause some individuals to develop skin rash and other skin complications due to allergic skin sensitization.
Acute Toxicity:	May cause skin, eye and mucous membrane irritation (includes upper respiratory tract). Ingestion may cause gastrointestinal discomfort.Damage occurs to liver, kidney, central nervous system, and lungs.
Subchronic / Chronic Toxicity:	Damage occurs to liver, kidney, central nervous system, and lungs.
HYDRAZINE	Damage occurs to liver, kidney, central nervous system, and lungs.
Reproductive and Developmental Toxicity:	Reproductive and/or developmental toxicity was observed in laboratory animals only at high doses that were maternally toxic.
Mutagenicity:	This product has been tested and was found to be mutagenic.
Carcinogenicity:	This chemical is considered to be a suspect human carcinogen based on animal data.
HYDRAZINE	The International Agency for Research on Cancer (IARC) has classified this product or a component of this product as a Group 2B substance, Possibly Carcinogenic to Humans.

12. ECOLOGICAL INFORMATION

Overview: Moderately toxic to fish and other aquatic organisms.

Ecological Toxicity Values for: **HYDRAZINE**

Rainbow trout (Salmo gairdneri),	-	76 h LC50 6 mg/l
Fathead minnow (Pimephales promelas),	-	(flow-through). 96 h LC50 5.98 mg/l
Channel Catfish (Ictalurus punctatus rafinesque),	-	(static). 96 h LC50 1.0 mg/l
Bluegill	-	(static). 96 h LC50 1.08 mg/l
Bluegill	-	(nominal, static). 96 h LC50 4.2 mg/l (35% Hydrazine)
Rainbow trout (Salmo gairdneri),	-	(nominal, static). 96 h LC50 4.3 mg/l (35% Hydrazine)
Daphnia magna,	-	24 h EC50 2.3 mg/l
Daphnia magna,	-	(nominal, static). 48 h LC50 0.46 mg/l (35% Hydrazine)

Green algae (Selenastrum capricornutum),	-	72 h EC50 0.0061 mg/l

13. DISPOSAL CONSIDERATIONS

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THE MATERIAL. THE USER OF THE MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

Waste Disposal Summary :	If this product becomes a waste, it will be a hazardous waste.
Disposal Methods :	As a hazardous liquid waste it must be disposed of in accordance with local, state and federal regulations.
Potential US EPA Waste Codes :	U133

14. TRANSPORT INFORMATION

Land (US DOT):	UN3293 RQ, HYDRAZINE, AQUEOUS SOLUTION 6.1 III MARINE POLLUTANT
Water (IMDG):	UN3293 HYDRAZINE, AQUEOUS SOLUTION, 6.1 III MARINE POLLUTANT
	Flash Point: Material is water-based and will not flash.
Air (IATA):	CONTACT ARCH'S TRANSPORTATION DEPARTMENT,
Emergency Response Guide Number:	ERG # 152
EMS:	F-A, S-A

15. REGULATORY INFORMATION

UNITED STATES:

Toxic Substances Control Act (TSCA):	The components of this product are listed on the TSCA Inventory of Existing Chemical Substances.
EPA Pesticide Registration Number:	None established
FIFRA Listing of Pesticide Chemicals (40 CFR 180):	Not registered in the US under FIFRA.Not registered in the US under FIFRA.

Superfund Amendments and Reauthorization Act (SARA) Title III:

Hazard Categories Sections 311 / 312 (40 CFR 370.2):

Health	Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
Physical	None

Emergency Planning & Community Right to Know (40 CFR 355, App. A):

Extremely Hazardous Substance Section 302 - Threshold Planning Quantity:

ZUS_SAR302	TPQ (threshold planning quantity)

Reportable Quantity (49 CFR 172.101, Appendix):

ZUS_CERCLA	Reportable quantity	Hydrazine Value: 1lbs
ZUS_SAR302	Reportable quantity	Hydrazine Value: 1lbs

Supplier Notification Requirements (40 CFR 372.45), 313 Reportable Components

ZUS_SAR313	De minimis concentration	Hydrazine Value: < 0.1% by weight

Clean Air Act Toxic ARP Section 112r:

CAA 112R	None established

Clean Air Act Socmi:

HON SOC	None established

Clean Air Act VOC Section 111:

CAA 111	None established

Clean Air Act Haz. Air Pollutants Section 112:

ZUS_CAAHAP

ZUS_CAAHRP

CAA AP	None established

State Right-to-Know Regulations Status of Ingredients

Pennsylvania:

CAS #	COMPONENT NAME
302-01-2	HYDRAZINE

ZUSPA_RTK

Pennsylvania: Hazardous substance list
1989-08-11
HYDRAZINE
Environmental hazard, Special hazardous substance

Pennsylvania: Hazardous substance list
1990-01-01
HYDRAZINE (ANHYDROUS)
hazardous substance

Pennsylvania: Hazardous substance list
1989-08-11
HYDRAZINE (ANHYDROUS)

New Jersey:

CAS #	COMPONENT NAME
302-01-2	HYDRAZINE

ZUSNJ_RTK

New Jersey Right to Know Hazardous Substance List (RTK-HSL)
2007-03-01
HYDRAZINE
Special Health Hazard - Carcinogen, Special Health Hazard - Corrosive, Special Health Hazard - Flammable - Fourth Degree, Special Health Hazard - Mutagen, Special Health Hazard - Reactive - Third Degree, Special Health Hazard - Teratogen

Massachusetts:

CAS #	COMPONENT NAME
302-01-2	HYDRAZINE

ZUSMA_RTK

Massachusetts Right to Know List of Chemicals and Hazard Classifications
1993-04-24
HYDRAZINE
Carcinogen, Extraordinarily hazardous

California Proposition 65:

CAS #	COMPONENT NAME
302-01-2	HYDRAZINE

ZUSCA_P65

California Proposition 65. Safe drinking water and toxic enforcement act.
No Significant Risk Levels 0.04 ug/day
Hydrazine
Carcinogen

California Proposition 65. Safe drinking water and toxic enforcement act.
No Significant Risk Levels 0.04 micrograms per day
Hydrazine

California Proposition 65. Safe drinking water and toxic enforcement act.
Hydrazine
Carcinogen

WHMIS Hazard Classification:

Ingredient Disclosure List (WHMIS)
2007-08-24
Threshold limits: 0.1 Weight percent
978
Hydrazine

16. OTHER INFORMATION

MSDS REVISION STATUS :
SECTIONS REVISED: 2
Major References : Available upon request.

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. ARCH CHEMICALS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ARCH CHEMICALS MSDS CONTROL AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT. .