

N42237.AR.000506
NSB KINGS BAY
5090.3a

LETTER REGARDING NAVY APPLICATION FOR UNDERGROUND INJECTION WELL
CONTROL PERMIT ATTACHED NSB KINGS BAY GA
11/19/2001
NSB KINGS BAY



DEPARTMENT OF THE NAVY

NAVAL SUBMARINE BASE
1063 USS TENNESSEE AVENUE
KINGS BAY, GEORGIA 31547-2606

NSB Kings Bay Administrative Record
Document Index Number

31547-000
09.01.00.0173

IN REPLY REFER TO:

5090
Ser FE4/2581
19 NOV 2001

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Bijan Rahbar
Georgia Department of Natural Resources
Environmental Protection Division
205 Butler Street, SE, Suite 1252
Atlanta, GA 30334

Dear Mr. Rahbar:

Our application for an underground injection control permit for Kings Bay Submarine Base Site 11, Old Camden County Landfill, Kings Bay, Georgia, is attached as enclosure (1). We would like to inject potassium hydroxide, sodium hydroxide tracer, and Oil Red 26 tracer. This is in addition to the injections planned and conducted per our revised UIC permit #089 dated August 21, 2001.

Locations and construction details are shown in enclosure (2). Our Corrective Action Plan is attached as enclosure (3). Material Safety Data Sheets of chemicals to be injected are attached as enclosure (4). A topographic map is attached as enclosure (5).

The SUBASE Kings Bay point of contact is Ken Yargus, (912) 673-2001, extension 1217. Please address all correspondence to

5090
Ser FE4/2581

19 NOV 2001

"Commanding Officer, Naval Submarine Base, Kings Bay, 1063 USS
TENNESSEE Avenue, Kings Bay, GA 31547-2606."

Sincerely,



JOHN R. GARNER
Leader, Environmental Division
Facilities & Environmental
By direction of the
Commanding Officer

Enclosures: 1. Injection Permit Application and Checklist
2. Work Plan
3. Corrective Action Plan
4. Material Safety Data Sheets
5. Topographic map

Copy to: (w/o encls)
SOUTHNAVENCOM (Anthony Robinson)
J.A. Jones Environmental Services (Sam Ross)
J.A. Jones Environmental (SUBASE) (Kim Owens)
COMNAVREG SE

STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
GEORGIA GEOLOGIC SURVEY

INJECTION WELL OPERATING PERMIT APPLICATION

REGULATORY AGENCY:

Georgia Geologic Survey Branch
Environmental Protection Division
Georgia Department of Natural Resources
Room 400
19 Martin Luther King Jr. Dr. S.W.
Atlanta, Georgia 30334

LEGAL AUTHORITY:

Georgia Department of Natural Resources
Rules for underground Injection Control,
Chapter 391-3-6-.13.
Georgia Water Quality Control Act
O.C.G.A. 12-5-20 et. seq.

Naval Submarine Base, Site 11, Old Camden Co. Landfill
Kings Bay, GA

FACILITY DATA

Dept. of the Navy, Naval Submarine Base

Business/Corporate Name

1063 USS Tennessee Ave, Kings Bay

Camden County

Street

City

County

Georgia

31547-2606

912-673-2001 ext. 1217

State

Zip Code

Telephone Number

Lat: 30 48' 40.2" N

Long: 81 34' 18.4" W

Location: Latitude and Longitude (Degrees, Minutes, Seconds)

U.S. Military

Type of Industry

John Garner for Subbase Commanding Officer

Name of Owner or Authorized Representative

Leader, Environmental Division, ext. 4048

Title of Authorized Representative Number if Different from Above

Is the underground injection part of a corrective action or remediation plan to be included in another EPD permit? If so, please explain.

Corrective Action per HWMB permit #HW-014 (S&T)-3
EPA ID# GA17009001 Previous injections per GA UIC permit #089

ENCLOSURE (1)

Page Two
Application

Two companies combined to do the drilling:
Zebra Environmental Corp.
503 N. Faulkenburg Rd.
Tampa, FL 33619

**INJECTION WELL DATA
DRILLER:**

Transamerican Drilling		OFL432487
Ga. Licensed Water Well Contractor or Bonded Environmental Drilling Company		Lic. Num. Bond Num.
P.O. Box 57323	Jacksonville	Duval
Street	City	County
Florida	32241	904-292-2734
State	Zip Code	Telephone Number

How many injection wells or devices does this application include?
Please supply number here: 20

Are the wells or devices proposed or existing? Existing

Classification of injection well(s) or devices (please circle):
I, II, III, IV (prohibited), V

INJECTION WELL CONSTRUCTION

Well Depth 48 feet Borehole Dia. 3.25" O.D.
2.5" I.D. Csg. Depth 45 feet

Csg. Dia. 0.75" O.D. Screen Type 0.010-slot Screen Dia. 0.75"

Screened Interval: from 45 feet to 48 feet

Grout Type 95% Portland Cement, 5% bentonite powder

Grouted Interval: from 42 feet to grade Grout Thick. 2.5" thick
42 feet deep

Csg. Material (please check material used):

 PVC XX Black Steel Galvanized Steel Polybutylene

 Polyethylene Black Latex Fiberglass Stainless Steel

 Other

Please provide a detailed diagram of the injection well(s) or device(s) showing the items described above. See attached figure 3-2

INJECTION SYSTEM DATA
Type of Injection Fluid: Potassium hydroxide and water solution (pH of 10-11);
Sodium Bromide and Oil Red 26 water and oil tracers
~~(solids dissolved in vegetable oil/water emulsification)~~

INJECTION SYSTEM DATA (CONT.)

Potassium Hydroxide: Seidler Chemical
Source of Injected Fluid: Sodium Bromide and Oil Red 26 tracers: Tracer Tech Inc.
Potassium hydroxide to equalize pH following hydrogen peroxide/
Purpose of Injection: catalyst injection. Tracers to monitor transport of treated
water and injected oil.
Proposed Injection Rate: 3 maximum daily gallons per minute per well
(SCFM for air)

Proposed Injection Volume: 100 maximum daily gallons per well
(SCFM for air)

Proposed Injection Pressure: 40 psi max - potassium hydroxide: 10 psi max - tracer
maximum daily lbs./sq. inch (psi)
5 to 10 psi likely

Please include the following with the application:

- a. A chemical analysis of the injected fluid. The analysis must include all constituents specified in the currently applicable Georgia Rules for Safe Drinking Water.
- b. A detailed diagram showing the engineering layout of the injection equipment and all piping associated with the system.
- c. A comprehensive subsurface report, prepared by or directly supervised by a Georgia Professional Geologist, including all the geological and hydrogeological parameters of the site.
- d. A notarized statement may be required from the applicable local government stating that the injection project is consistent with the local land use plan or zoning requirements.
- e. A detailed map orienting the injection well(s) and any other wells to two (2) nearby reference points such as roads, streams or nearby structures, etc. Please clearly mark the distances from the wells to the reference points.
- f. The approved Corrective Action Plan for the UIC permit file.

The applicant specifically grants to EPD or any authorized agent of the Director the right of entry and travel upon the injection well site for the purpose of conducting necessary compliance inspections.

Certification:

I certify under the penalty of law that I have examined and am familiar with the information contained in this document and all attachments and that, based on the inquiry of the individuals responsible for the data, I believe that the information is true, accurate and complete. I am aware that there are penalties for submitting false information, including the possibility of fine and imprisonment.

John Garner

Owner or Authorized Representative

JOHN R. GARNER
Leader, Environmental Division
Facilities and Environmental
By direction of the
Compliance Officer

Signature



11/19/01

Date Signed

UIC PERMIT APPLICATION CHECKLIST
(to be completed by applicant)

APPLICANT: Naval Submarine Base Kings Bay

DATE: November 19, 2001

ADDRESS: Naval Submarine Base Kings Bay
1063 USS Tennessee Avenue
Kings Bay, GA 31547-2606

TELEPHONE NUMBER: 912-673-2001 ext. 1217

REQUIREMENTS	CODE SECTION	INCLUDED	NOT INCLUDED	NOT/APPLI-CABLE	COMMENTS (e.g. reference pg.no. in report)
1. Name, mailing address and facility location	391-3-6-.13 (11) (C)1.	XX			Cover letter
2. Name and address of the owner/operator if different than the facility	391-3-6-.13 (11) (C)2.			XX	
3. Proposed or existing injection rate and and injection pressure or gravity flow	391-3-6-.13 (11) (C)5.	XX			Application
4. The chemical, physical and radioactive characteristics of the injected fluid	391-3-6-.13 (11) (c)6.	XX			MSDS
5. A diagram detailing the construction of existing and/or proposed injection wells	391-3-6-.13 (11) (C)4.	XX			Work Plan, figure 3-2, encl. (2)

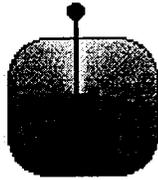
REQUIREMENTS	CODE SECTION	INCLUDED	NOT INCLUDED	NOT/APPLI-CABLE	COMMENTS. (e.g. reference pg.no. in report)
6. Activities requiring the applicant to apply for a UIC permit	40 CFR 144.31 (e) (1)	XX			Corrective Action Plan Encl (3)
7. Up to 4 SIC Codes describing the principle products of the facility	40 CFR 144.31 (e) (3)	XX			9711 National Security
8. Status as Federal, State, private, or public entity	40 CFR 144.31 (e) (4)	XX			Federal
9. Is the facility located on Indian Lands	40 CFR 144.31 (e) (5)			XX	
10. A listing of all permits or construction approvals received or applied for under any of the following programs: a. Hazardous Waste (RCRA) b. UIC c. NPDES d. PSD under Clean Air Act e. Nonattainment program under the Clean Air Act	40 CFR 144.31 (e) (6)				
		XX			RCRA permit HW-014 (S&T)-3
		XX			UIC permit #089 dtd August 21, 01
		XX			GA0027707
				XX	Applied for title V permit Feb01.
				XX	

REQUIREMENTS	CODE SECTION	INCLUDED	NOT INCLUDED	NOT/APPLI-CABLE	COMMENTS (e.g. reference pg.no. in report)
f. National Emission Standards for Hazardous Pollutants g. Ocean Dumping under Marine Protection h. Dredge and fill permits under 404 of CWA i. other relevant environmental permits including State permits		XX			Applied for Title V permit FEB01, awaiting approval of GA DNR.
		XX			One Section 103 permit for offshore dumping of dredge material.
		XX			Two Section 404 permits for maintenance dredging.
		XX			One GA water quality certificate for maintenance dredging.
11.A topomap, extending 1 mi. beyond the property boundaries depicting the facility, intake and discharge structures including the injection wells, and all other items mentioned in the code section	40 CFR 144.31(e) (7)	XX			
12.A brief description of the nature of the business		XX			Maintenance and operation facilities for the support of Fleet Ballistic Missile submarines.

REQUIREMENTS	CODE SECTION	INCLUDED	NOT INCLUDED	NOT/APPLI-CABLE	COMMENTS (e.g. reference pg.no. in report)
13. Signature of the applicant, or a responsible corporate officer (i.e. president, secretary, treasurer, or vice president in charge of a principle business function, or a manager meeting the conditions in 40 CFR 144.32(a)(1))	40 CFR 144.32(a)(1) 391-3-6-.13(11)(C)7.	XX			
14. Other reports or information necessary to evaluate the facility including but not limited to: a. geological report b. hydrogeological reports c. engineering reports d. chemical reports	391-3-6-.13(11)(D)2.				
		XX			CAP appendix A, encl. (3)
		XX			CAP appendix A
		XX			CAP encl. (3)
15. Driller's water well contractor number or bond number	Water Well Standards Act of 1985	XX			Transamerican Drilling License No. OFL432487

Reviewer:

Date:



Geo-Cleanse International, Inc.

**Phase IV Injection Work Plan
Geo-Cleanse® Treatment Program**

**Naval Submarine Base Kings Bay
Kings Bay, Georgia**

**Prepared for:
CH2M Hill Constructors, Inc.
115 Perimeter Center Place, N.E.
Suite 700
Atlanta, GA 30346**

September 13, 2001

Geo-Cleanse International, Inc
4 Mark Road, Suite C
Kenilworth, NJ 07033
Tel (908) 206-1250
Fax (908) 206-1251

information@geocleanse.com
www.geocleanse.com

ENCLOSURE (2)

CORRECTIVE ACTION PLAN

SITE 11, OLD CAMDEN COUNTY LANDFILL
NAVAL SUBMARINE BASE KINGS BAY, GEORGIA

Prepared for

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND

Under Contract No. N62467-93-D-0936

Prepared by

BECHTEL ENVIRONMENTAL, INC.
OAK RIDGE, TENNESSEE

JULY 1998

REVISION 1

Bechtel Job No. 22567

Please reduce your browser font size for better viewing and printing.

MSDS

Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

MALLINCKRODT



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 202-483-7616

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

POTASSIUM HYDROXIDE (10 - 45%) Solutions and Concentrates

MSDS Number: P5887 --- Effective Date: 11/17/99

1. Product Identification

Synonyms: Caustic potash - liquid or solutions; Potassium hydrate

CAS No.: 1310-58-3 (Potassium hydroxide)

Molecular Weight: 56.11

Chemical Formula: KOH (10 - 45% in water)

Product Codes:

J.T. Baker: 3143, 3144, 3148, 3149, 3154, 4673, 4674, 5379

Mallinckrodt: 6671, 6968, H061, H320, V034

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	
Hazardous			
-----	-----	-----	-----
Potassium Hydroxide	1310-58-3	10 - 45%	Yes
Water	7732-18-5	55 - 90%	No

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. CAUSES SEVERE BURNS TO SKIN, EYES, RESPIRATORY TRACT, AND GASTROINTESTINAL TRACT. MATERIAL IS EXTREMELY DESTRUCTIVE TO ALL BODY TISSUES. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED.

ENCLOSURE (4)

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)

Flammability Rating: 0 - None

Reactivity Rating: 1 - Slight

Contact Rating: 4 - Extreme (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: White Stripe (Store Separately)

Potential Health Effects

Inhalation:

Respiratory tract irritant, may cause serious burns on acute contact. Severe injury is usually avoided by the self-limiting coughing and sneezing symptoms.

Ingestion:

Toxic! Corrosive to mucous membranes and may cause perforation of the esophagus and stomach. Abdominal pain, nausea, vomiting, general gastro-intestinal upset can be expected.

Skin Contact:

Irritant, possibly corrosive if contact is prolonged. Soreness, redness, destruction of skin may result.

Eye Contact:

Irritant, possibly corrosive to eye tissues. Tearing, redness, pain, impaired vision are symptoms.

Chronic Exposure:

Development of a defatting dermatitis on prolonged contact with potassium hydroxide has been reported. Continued irritation may lead to increased susceptibility to respiratory illness.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems, or impaired kidney or respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:

DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Avoid direct contact of liquid with water.

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.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRACIT(R)-2 or BuCAIM(R) caustic neutralizers are recommended for spills of this product.

7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, ventilated area. Protect against physical damage. Separate from acids and alkalis. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

For Potassium Hydroxide [1310-58-3]:

- OSHA Permissible Exposure Limit (PEL):

2 mg/m³ Ceiling

- ACGIH Threshold Limit value (TLV):

2 mg/m³ Ceiling

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Clear, colorless solution.

Odor:

Odorless.

Solubility:

Completely soluble in water.

Specific Gravity:

10% Solution:1.1 - to- 45% Solution:1.45

pH:

13.5 (0.1 molar solution)

% Volatiles by volume @ 21C (70F):

90 (as water)

Boiling Point:

10% Solution:101C (213F) to 45% Solution: 132C (270F)

Melting Point:

10% Solution:-3C (27F) to 45% Solution -29C (-20F).

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

10% Solution: No Information Found - to - 45% Solution: 2 @ 20C (68F)

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Potassium oxide.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Strong acids, aluminum, tin, zinc, chlorinated hydrocarbons, acetone.

Conditions to Avoid:

Heat, incompatibles.

11. Toxicological Information

For potassium hydroxide: Oral rat LD50: 273 mg/kg; Investigated as a mutagen. Skin Irritation Data (std Draize, 50 mg/24 H): Human, Severe; Rabbit, Severe. Eye Irritation Data(Rabbit, non-std test, 1 mg/24 H, rinse): Moderate.

-----\Cancer Lists\-----

Ingredient Category	---NTP Carcinogen---		IARC
	Known	Anticipated	
Potassium Hydroxide (1310-58-3)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:

No information found.

Environmental Toxicity:

Potassium Hydroxide: TLm: 80 ppm/Mosquito fish/ 24 hr./ Fresh water

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. 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

Domestic (Land, D.O.T.)

Proper Shipping Name: POTASSIUM HYDROXIDE, SOLUTION

Hazard Class: 8

UN/NA: UN1814

Packing Group: II

Information reported for product/size: 360LB

International (Water, I.M.O.)

Proper Shipping Name: POTASSIUM HYDROXIDE, SOLUTION

Hazard Class: 8

UN/NA: UN1814

Packing Group: II

Information reported for product/size: 360LB

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----

Ingredient	TSCA	EC	Japan	
Australia				
Potassium Hydroxide (1310-58-3)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----

Ingredient	Korea	--Canada--		Phil.
		DSL	NDSL	
Potassium Hydroxide (1310-58-3)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----

Ingredient	-SARA 302-		-----SARA 313-----	
	RQ	TPQ	List	Chemical
Potassium Hydroxide (1310-58-3)	No	No	No	No
Water (7732-18-5)	No	No	No	No

-----\Federal, State & International Regulations - Part 2\-----

Ingredient	CERCLA	-RCRA-	-TSCA-
		261.33	8 (d)
Potassium Hydroxide (1310-58-3)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
 Reactivity: Yes (Pure / Liquid)

Australian Hazchem Code: 2R

Poison Schedule: S6

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: 3 Flammability: 0 Reactivity: 1

Label Hazard Warning:

POISON! DANGER! CORROSIVE. CAUSES SEVERE BURNS TO SKIN, EYES, RESPIRATORY TRACT, AND GASTROINTESTINAL TRACT. MATERIAL IS EXTREMELY DESTRUCTIVE TO ALL BODY TISSUES. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED.

Label Precautions:

Do not breathe mist.
Do not get in eyes, on skin, or on clothing.
Avoid breathing mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Label First Aid:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

No changes.

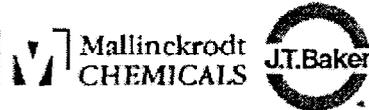
Disclaimer:

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Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

MSDS**Material Safety Data Sheet**

From: Mallinckrodt Baker, Inc.
 222 Red School Lane
 Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
 CHEMTREC: 1-800-424-9300

National Response In Canada
 CANUTEC: 613-996-6666

Outside U.S. and Canada
 Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

SODIUM BROMIDE

MSDS Number: S3170 --- Effective Date: 11/17/99

1. Product Identification

Synonyms: Sedoneural
 CAS No.: 7647-15-6
 Molecular Weight: 102.89
 Chemical Formula: NaBr
 Product Codes:
 J.T. Baker: 3588
 Mallinckrodt: 0514, 0535

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	
Hazardous			
Sodium Bromide	7647-15-6	100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED. AFFECTS CENTRAL NERVOUS SYSTEM, BRAIN AND EYES. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:

Dust may cause irritation to the respiratory tract; symptoms may include coughing and shortness of breath.

Ingestion:

May cause nausea, vomiting and abdominal pain. Ingestions are usually promptly rejected by vomiting, but sufficient absorption may occur to produce central nervous system, eye and brain effects. Symptoms may include skin rash, blurred vision and other eye effects, drowsiness, irritability, dizziness, mania, hallucinations, and coma.

Skin Contact:

Dry material may cause mild irritation. Solutions may cause irritation, redness, and pain.

Eye Contact:

May cause irritation, redness and pain.

Chronic Exposure:

Repeated or prolonged exposure by any route may cause skin rashes (bromaderma). Repeated ingestion of small amounts may cause central nervous system depression, including depression, ataxia, psychoses, memory loss, irritability, and headache.

Aggravation of Pre-existing Conditions:

Persons suffering from debilitation, depression, alcoholism, neurological or psychological disorders may be more susceptible to the effects of this compound.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give

anything by mouth to an unconscious person. Call a physician.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire.

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.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

None established.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred

because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

For conditions of use where exposure to the dust or mist is apparent, a half-face dust/mist respirator may be worn. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

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:

White crystals, granules, or powder

Odor:

Odorless.

Solubility:

116 g/100 g water @ 50C (122F)

Specific Gravity:

3.21

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

1390C (2534F)

Melting Point:

755C (1391F)

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

No information found.

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Absorbs moisture from air.

Hazardous Decomposition Products:

Oxides of the contained metal and halogen, possibly also free, or ionic halogen.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Acids, alkaloidal and heavy metal salts, oxidizers, and bromine trifluoride.

Conditions to Avoid:

Moisture and incompatibles.

11. Toxicological Information

Toxicological Data:

Sodium Bromide: Oral rat LD50: 3500 mg/kg. Investigated as a reproductive effector.

Reproductive Toxicity:

Causes reproductive system effects in laboratory animals.

-----\Cancer Lists\-----

Ingredient Category	---NTP Carcinogen---		IARC
	Known	Anticipated	
Sodium Bromide (7647-15-6)	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 managed in an appropriate and approved waste disposal 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

Not regulated.

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	
Australia				
Sodium Bromide (7647-15-6)	Yes	Yes	Yes	Yes
-----\Chemical Inventory Status - Part 2\-----				
Ingredient	Korea	DSL	NDSL	Phil.
Sodium Bromide (7647-15-6)	Yes	Yes	No	Yes
-----\Federal, State & International Regulations - Part 1\-----				
Ingredient	-SARA 302-	TPQ	-SARA 313-	Chemical
Catg.	RQ		List	
Sodium Bromide (7647-15-6)	No	No	No	No
-----\Federal, State & International Regulations - Part 2\-----				
Ingredient	CERCLA	261.33	-TSCA-	8(d)
Sodium Bromide (7647-15-6)	No		No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: No information found.

Poison Schedule: No information found.

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: 2 Flammability: 0 Reactivity: 0

Label Hazard Warning:

WARNING! HARMFUL IF SWALLOWED. AFFECTS CENTRAL NERVOUS SYSTEM, BRAIN AND EYES. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

Label Precautions:

Avoid breathing dust.

Keep container closed.

Use with adequate ventilation.

Avoid contact with eyes, skin and clothing.

Wash thoroughly after handling.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. In all cases call a physician.

Product Use:

Laboratory Reagent.

Revision Information:

No changes.

Disclaimer:

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Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

KEYSTONE ANILINE CORP -- 606-026-50 KEYSTONE OIL RED OE

=====
MSDS Safety Information
=====

FSC: 9150
MSDS Date: 01/30/1995
MSDS Num: BXKWX
LIIN: 00F040064
Product ID: 606-026-50 KEYSTONE OIL RED OE
MFN: 01
Responsible Party
Cage: 24877
Name: KEYSTONE ANILINE CORP
Address: 2501 W FULTON
City: CHICAGO IL 60612-2103
Info Phone Number: 312-666-2015
Emergency Phone Number: 312-666-2015
Review Ind: Y
Published: Y

=====
Preparer Co. when other than Responsible Party Co.
=====

Cage: 24877
Name: KEYSTONE ANILINE CORP
Address: 2501 W FULTON
City: CHICAGO IL 60612-2103

=====
Contractor Summary
=====

Cage: 24877
Name: KEYSTONE ANILINE CORP
Address: 2501 W FULTON
City: CHICAGO IL 60612-2103
Phone: 312-666-2015

=====
Ingredients
=====

Cas: 4477-79-6
Name: C.I. SOLVENT RED 26 *95-1*
% Wt: <1

=====
Health Hazards Data
=====

Route Of Entry Inds - Inhalation: NO
Skin: NO
Ingestion: YES
Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO
Effects of Exposure: EYES/SKIN: MAY CAUSE IRRITATION. INGESTION: MAY BE HARMFUL.
Explanation Of Carcinogenicity: NONE
Signs And Symptoms Of Overexposure: IRRITATION
First Aid: INHALATION: MOVE TO FRESH AIR. IF DIFFICULTY BREATHING, GIVE OXYGEN.
INGESTION: GIVE SEVERAL GLASSES OF WATER & INDUCE VOMITING. NEVER GIVE FLUIDS/INDUCE VOMITING IF UNCONSCIOUS/HAVING CONVULSIONS. EY ES: FLUSH W/FLOWING WATER FOR 15 MINS. SKIN: WASH W/SOAP & WATER. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
Handling and Disposal
=====

Spill Release Procedures: WEAR A NIOSH APPROVED DUST RESPIRATOR W/SPECIAL PROTECTION CLOTHING & EQUIPMENT. USE AN ABSORBENT TO PREVENT DUSTING,

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SWEEP/SHOVEL INTO A WASTE DISPOSAL CONTAINER. WASH DOWN THE AREA W/DILUTE BLEACH.

Waste Disposal Methods: BURY/INCINERATE IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS.

Handling And Storage Precautions: CONTAINERS MAY CONTAIN PRODUCT RESIDUES & SHOULDN'T BE REUSED W/OUT PROFESSIONAL CLEANING & RECONDITIONING. HANDLE W/CARE.

Other Precautions: AVOID PERSONAL CONTACT. USE GOOD INDUSTRIAL PRACTICES. WHEN SELECTING PROTECTIVE EQUIPMENT & CLOTHING. FOLLOW MANUFACTURERS SPECIFICATIONS & RECOMMENDATIONS FOR YOUR PARTICULAR OPERATION, PROCESSES, CONDITIONS & MATERIALS BEING HANDLED.

=====
Fire and Explosion Hazard Information
=====

Extinguishing Media: ALL METHODS ACCEPTABLE

Fire Fighting Procedures: WEAR SELF CONTAINED BREATHING APPARATUS W/FULL PROTECTIVE CLOTHING.

Unusual Fire/Explosion Hazard: AVOID DUSTY CONDITIONS. ORGANIC DUSTS HAVE EXPLOSION POTENTIAL IF MIXED W/AIR IN CRITICAL PROPORTIONS IN PRESENCE OF A SOURCE OF IGNITION.

=====
Control Measures
=====

Respiratory Protection: WEAR NIOSH APPROVED DUST RESPIRATOR

Ventilation: LOCAL EXHAUST

Protective Gloves: IMPERVIOUS RUBBER

Eye Protection: CHEMICAL SAFETY GOGGLES

Other Protective Equipment: LONG SLEEVED SHIRT, PANTS, COVERALLS, BOOTS, DELUGE SAFETY SHOWER & EYE WASH

Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

=====
Physical/Chemical Properties
=====

Solubility in Water: INSOLUBLE

Appearance and Odor: RED POWDER W/NO ODOR

=====
Reactivity Data
=====

Stability Indicator: YES

Stability Condition To Avoid: HEAT, OPEN FLAME & OTHER IGNITION SOURCES

Materials To Avoid: STRONG OXIDIZING AGENTS

Hazardous Decomposition Products: OXIDES OF CARBON & NITROGEN

Hazardous Polymerization Indicator: NO

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Toxicological Information
=====

=====
Ecological Information
=====

=====
MSDS Transport Information
=====

=====
Regulatory Information
=====

=====
Other Information
=====

=====
HAZCOM Label
=====

Product ID: 606-026-50 KEYSTONE OIL RED OE

Cage: 24877

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Company Name: KEYSTONE ANILINE CORP
Street: 2501 W FULTON
City: CHICAGO IL
Zipcode: 60612-2103
Health Emergency Phone: 312-666-2015
Label Required IND: Y
Date Of Label Review: 12/16/1998
Status Code: C
Label Date: 12/16/1998
Origination Code: G
Hazard And Precautions: EYES/SKIN: MAY CAUSE IRRITATION. INGESTION: MAY BE
HARMFUL.

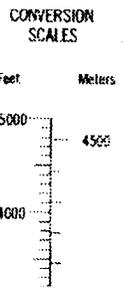
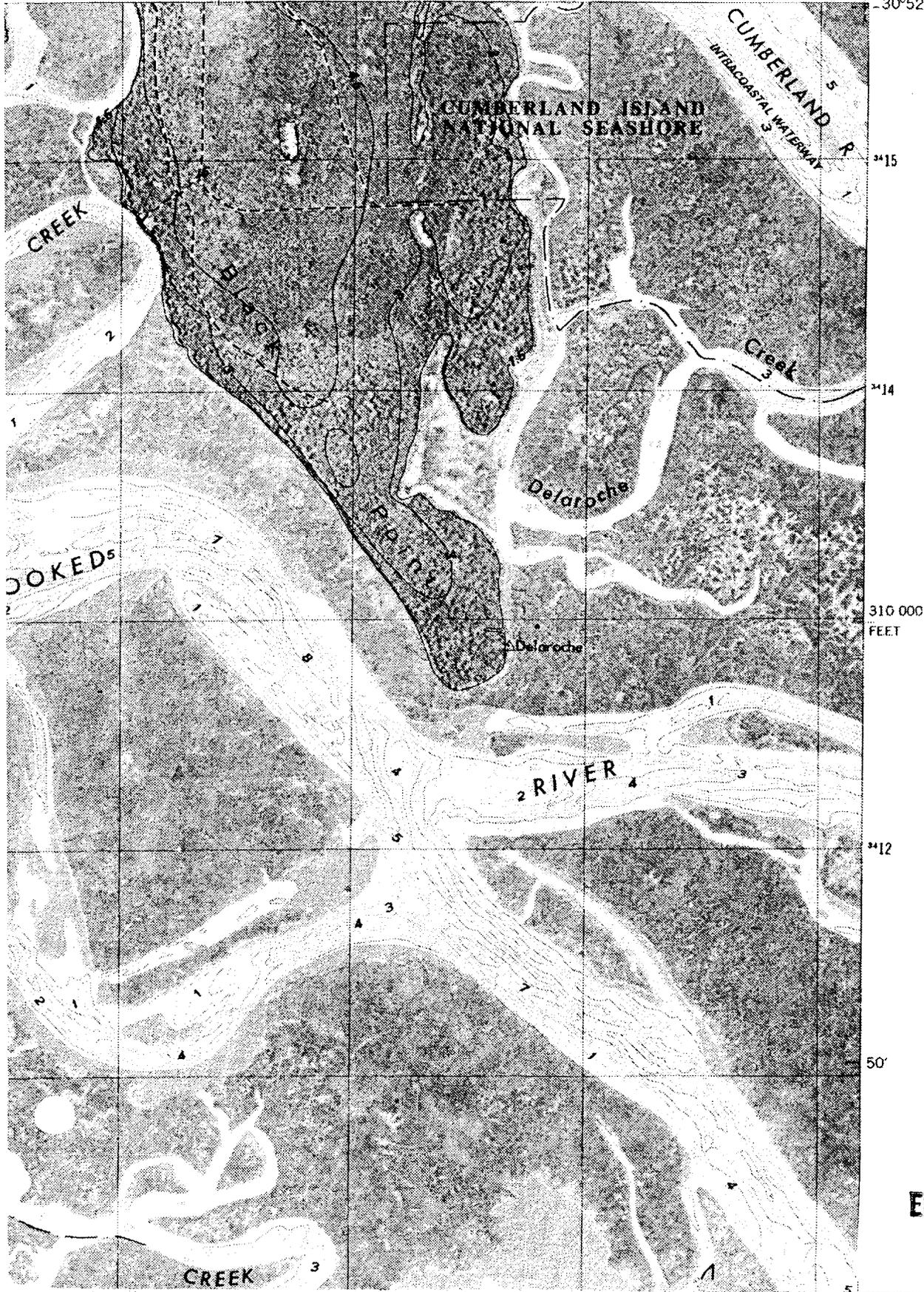
IRRITATION

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HARRIETTS BLUFF QUADRANGLE
 GEORGIA—CAMDEN CO.
 7.5 MINUTE SERIES ORTHOPHOTOMAF
 (TOPOGRAPHIC—BATHYMETRIC)

4746 IV NW
 (CUMBERLAND ISLAND NORTH)

49 700 000 FEET 50 51 52 81°30' 30°52'30"



ENCLOSURE (5)