

TEAM RIO

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KBR subcontractor personnel entering the area should wear personal protective equipment (PPE), which, at a minimum should be consistent with USEPA Level C PPE. Personnel entering the conveyor and mixing tank areas should wear PPE consistent with USEPA Level B.

3. A complete Environmental Health and Safety assessment should be performed at the WTP to verify that all existing potential environmental health issues are identified and addressed. This should also apply to all facilities in which KBR personnel are present.

**Follow-Up/Action Items:**

1. The results of the analyses will be forwarded as soon as received.
2. Based on the results of the analyses, more extensive soil and air sampling may be required.
3. Based on the results of the analyses, remedial actions may be required.

**Assumptions:**

**Additional/Misc:**

## **MATERIAL SAFETY DATA SHEET**

### **SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

**SUBSTANCE: SODIUM DICHROMATE**

**TRADE NAMES/SYNONYMS:**

CHROMIC ACID (H<sub>2</sub>CR<sub>2</sub>O<sub>7</sub>), DISODIUM SALT; DICHROMIC ACID (H<sub>2</sub>CR<sub>2</sub>O<sub>7</sub>), DISODIUM SALT;

CHROMIUM SODIUM OXIDE (CR<sub>3</sub>NA<sub>2</sub>O<sub>7</sub>); DISODIUM DICHROMATE; SODIUM CHROMATE

(NA<sub>2</sub>CR<sub>2</sub>O<sub>7</sub>); SODIUM DICHROMATE (NA<sub>2</sub>CR<sub>2</sub>O<sub>7</sub>); SODIUM DICHROMATE(VI); SODIUM CHROMATE; SODIUM BICHROMATE; CR<sub>2</sub>NA<sub>2</sub>O<sub>7</sub>; MAT21190; RTECS HX7700000

**CHEMICAL FAMILY:** inorganic, salt

**CREATION DATE:** Jan 24 1989

**REVISION DATE:** Dec 16 2002

### **SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS**

**COMPONENT:** SODIUM DICHROMATE

**CAS NUMBER:** 10588-01-9

**PERCENTAGE:** 100.0

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### SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=3 FIRE=0 REACTIVITY=0

#### EMERGENCY OVERVIEW:

**COLOR:** orange or red

**ODOR:** odorless

**MAJOR HEALTH HAZARDS:** potentially fatal if swallowed, harmful on contact with the skin, respiratory tract burns, skin burns, eye burns, mucous membrane burns, allergic reactions, cancer hazard (in humans)

**PHYSICAL HAZARDS:** May ignite combustibles.

#### POTENTIAL HEALTH EFFECTS:

##### INHALATION:

**SHORT TERM EXPOSURE:** irritation (possibly severe), allergic reactions, loss of voice, chest pain,

difficulty breathing, headache, dizziness, lung congestion, kidney damage

**LONG TERM EXPOSURE:** lack of sense of smell, lack of sense of smell and taste, tooth decay, digestive

disorders, asthma, lung damage, liver damage, cancer

**MATHESON TRI-GAS, INC. EMERGENCY CONTACT:**

959 ROUTE 46 EAST CHEMTREC 1-800-424-9300

**PARSIPPANY, NEW JERSEY 07054-0624 INFORMATION CONTACT:**

973-257-1100

##### SKIN CONTACT:

**SHORT TERM EXPOSURE:** irritation (possibly severe), allergic reactions, nausea, vomiting, kidney

damage, coma

**LONG TERM EXPOSURE:** same as effects reported in short term exposure

##### EYE CONTACT:

**SHORT TERM EXPOSURE:** burns, eye damage

**LONG TERM EXPOSURE:** tearing, red bands around the cornea

##### INGESTION:

**SHORT TERM EXPOSURE:** allergic reactions, burns, vomiting, digestive disorders, dizziness, kidney

damage, liver damage, convulsions, coma, death

**LONG TERM EXPOSURE:** same as effects reported in short term exposure

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#### SECTION 4 FIRST AID MEASURES

**INHALATION:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

**SKIN CONTACT:** Remove contaminated clothing, jewelry, and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of chemical remains (approximately 15-20 minutes).

**EYE CONTACT:** Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

**INGESTION:** If vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

**ANTIDOTE:** dimercaprol, intramuscular.

**NOTE TO PHYSICIAN:** For inhalation, consider oxygen. For skin contact, consider sodium hyposulfite scrub, calcium disodium edetate ointment, ascorbic acid solution, aluminum acetate wet dressing. For ingestion, consider gastric lavage. Consider oxygen.

#### SECTION 5 FIRE FIGHTING MEASURES

**FIRE AND EXPLOSION HAZARDS:** Negligible fire hazard. Oxidizer. May ignite or explode on contact with combustible materials.

**EXTINGUISHING MEDIA:** water

Do not use dry chemicals, carbon dioxide or halogenated extinguishing agents. Large fires: Flood with water.

Apply water from a protected location or from a safe distance.

**FIRE FIGHTING:** Move container from fire area if it can be done without risk. Cool containers with water

spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool

containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is

impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny

entry. Let the fire burn. Flood with water. Cool containers with water spray until well after the fire is out.

Apply water from a protected location or from a safe distance. Avoid inhalation of material or

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combustion

by-products. Evacuate if fire gets out of control or containers are directly exposed to fire. Evacuation radius:

800 meters (1/2 mile).

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### WATER RELEASE:

Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

### OCCUPATIONAL RELEASE:

Avoid contact with combustible materials. Do not touch spilled material. Small dry spills: Move containers

away from spill to a safe area. Small liquid spills: Absorb with sand or other non-combustible material.

Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal.

Keep

unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee

and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section

304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

## SECTION 7 HANDLING AND STORAGE

**STORAGE:** Store and handle in accordance with all current regulations and standards. NFPA 430 Code for

the Storage of Liquid and Solid Oxidizing Materials. Protect from physical damage. Store in a cool, dry

place. Keep separated from incompatible substances. Avoid storage on wooden floors. Collect spilled material in appropriate container for disposal. Do not return to original containers. Keep separated

from

incompatible substances.

## SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

### EXPOSURE LIMITS:

#### SODIUM DICHROMATE:

#### CHROMIC ACID AND CHROMATES:

0.1 mg(CrO3)/m3 OSHA ceiling

0.01 mg(Cr)/m3 ACGIH TWA (insoluble compounds)

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0.05 mg(Cr)/m<sup>3</sup> ACGIH TWA (soluble compounds)

0.001 mg(Cr(VI))/m<sup>3</sup> NIOSH recommended TWA 10 hour(s)

**VENTILATION:** Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**EYE PROTECTION:** Wear splash resistant safety goggles with a faceshield. Provide an emergency eye

wash fountain and quick drench shower in the immediate work area.

**CLOTHING:** Wear appropriate chemical resistant clothing.

**GLOVES:** Wear appropriate chemical resistant gloves.

**RESPIRATOR:** The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

Measurement Element:

Chromium (Cr)

**At any detectable concentration -**

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or

other positive-pressure mode.

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure

mode in combination with a separate escape supply.

**Escape -**

Any air-purifying respirator with a full facepiece and a high-efficiency particulate filter.

Any appropriate escape-type, self-contained breathing apparatus.

**For Unknown Concentrations or Immediately Dangerous to Life or Health -**

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure

mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

**PHYSICAL STATE:** solid

**COLOR:** orange or red

**ODOR:** odorless

**MOLECULAR WEIGHT:** 261.90

**MOLECULAR FORMULA:** NA<sub>2</sub>-(O-CR-O<sub>2</sub>-O-CR-O<sub>2</sub>-O)

**BOILING POINT:** 752 F (400 C)

**MELTING POINT:** 675 F (357 C)

**DECOMPOSITION POINT:** 752 F (400 C)

**VAPOR PRESSURE:** Not applicable

**VAPOR DENSITY (air=1):** 10

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**SPECIFIC GRAVITY (water=1):** 2.348 @ 25 C  
**WATER SOLUBILITY:** soluble  
**PH:** 4.0 (1% solution)  
**VOLATILITY:** Not applicable  
**ODOR THRESHOLD:** Not available  
**EVAPORATION RATE:** Not applicable  
**COEFFICIENT OF WATER/OIL DISTRIBUTION:** Not available

#### SECTION 10 STABILITY AND REACTIVITY

**REACTIVITY:** Stable at normal temperatures and pressure.  
**CONDITIONS TO AVOID:** Avoid contact with combustible materials. May ignite or explode on contact with combustible materials. Keep out of water supplies and sewers.  
**INCOMPATIBILITIES:** combustible materials, reducing agents, amines  
**HAZARDOUS DECOMPOSITION:**  
Thermal decomposition products: chromium compounds  
**POLYMERIZATION:** Will not polymerize.

#### SECTION 11 TOXICOLOGICAL INFORMATION

##### SODIUM DICHROMATE:

##### TOXICITY DATA:

338 mg/kg skin-guinea pig LD50 (Dow); 50 mg/kg oral-rat LD50

**CARCINOGEN STATUS:** NTP: Known Human Carcinogen; IARC: Human Sufficient Evidence, Animal

Limited Evidence, Group 1; ACGIH: A1 -Confirmed Human Carcinogen (Hexavalent chromium compounds); EC: Category 1

##### LOCAL EFFECTS:

Corrosive: inhalation, skin, eye, ingestion

##### ACUTE TOXICITY LEVEL:

Highly Toxic: ingestion

Toxic: dermal absorption

**TARGET ORGANS:** immune system (sensitizer), kidneys

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** blood system disorders, heart or cardiovascular disorders, liver disorders, respiratory disorders, skin disorders and allergies

**TUMORIGENIC DATA:** Available.

**MUTAGENIC DATA:** Available.

**REPRODUCTIVE EFFECTS DATA:** Available.

**ADDITIONAL DATA:** May be excreted in breast milk.

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#### SECTION 12 ECOLOGICAL INFORMATION

##### ECOTOXICITY DATA:

**FISH TOXICITY:** 10000 ug/L 96 hour(s) LC50 (Mortality) Mosquitofish (*Gambusia affinis*)

**INVERTEBRATE TOXICITY:** 0.8-3.2 ug/L 7 hour(s) MATC (Reproduction) Water flea (*Ceriodaphnia dubia*)

**ALGAL TOXICITY:** 4 ug/L 8 hour(s) (Population Growth) Blue-green algae (*Anacystis aeruginosa*)

##### FATE AND TRANSPORT:

**BIOCONCENTRATION:** 956 ug/L 12 week(s) BCFD (Residue) Common bay mussel, blue mussel (*Mytilus edulis*) 5.05 ug/L

**ENVIRONMENTAL SUMMARY:** Toxic to aquatic life.

#### SECTION 13 DISPOSAL CONSIDERATIONS

Hazardous Waste Number(s): D007. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations

at or above the Regulatory level. Regulatory level- 5.0 mg/L. Dispose in accordance with all applicable regulations.

#### SECTION 14 TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

**PROPER SHIPPING NAME:** Toxic solid, corrosive, inorganic, n.o.s. (SODIUM DICHROMATE)

**ID NUMBER:** UN3290

**HAZARD CLASS OR DIVISION:** 6.1

**PACKING GROUP:** II

**LABELING REQUIREMENTS:** 6.1; 8

**CANADIAN TRANSPORTATION OF DANGEROUS GOODS:**

**SHIPPING NAME:** Toxic solid, corrosive, inorganic, n.o.s. (SODIUM DICHROMATE)

**ID NUMBER:** UN3290

**CLASSIFICATION:** 6.1, 8

**PACKING GROUP:** II

#### SECTION 15 REGULATORY INFORMATION

U.S. REGULATIONS:

**CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):**

**SODIUM DICHROMATE:** 10 LBS RQ

**SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):** Not regulated.

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**SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):** Not regulated.

**SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):**

**ACUTE:** Yes

**CHRONIC:** Yes

**FIRE:** Yes

**REACTIVE:** No

**SUDDEN RELEASE:** No

**SARA TITLE III SECTION 313 (40 CFR 372.65):**

**Chromium Compounds**

**OSHA PROCESS SAFETY (29CFR1910.119):** Not regulated.

**STATE REGULATIONS:**

**California Proposition 65:**

Known to the state of California to cause the following:

**Hexavalent Chromium Compounds**

**Cancer (Feb 27, 1987)**

**CANADIAN REGULATIONS:**

**WHMIS CLASSIFICATION:** Not determined.

**NATIONAL INVENTORY STATUS:**

**U.S. INVENTORY (TSCA):** Listed on inventory.

**TSCA 12(b) EXPORT NOTIFICATION:**

**HEXAVALENT CHROMIUM CHEMICALS**

**SECTION 6**

**CANADA INVENTORY (DSL/NDSL):** Not determined.

**SECTION 16 OTHER INFORMATION**

**MSDS SUMMARY OF CHANGES**

**SECTION 15 REGULATORY INFORMATION**

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