

Incoming

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**OGMCOAL - Fwd: Crandall iron test run**

**From:** Steve Christensen  
**To:** OGMCOAL  
**Date:** 3/29/2010 9:48 AM  
**Subject:** Fwd: Crandall iron test run  
**Attachments:** 8158.pdf

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>>> "Shaver, Dave" <dshaver@coalsource.com> 3/11/2010 3:29 PM >>>

To all....I apologize for not getting back to you sooner, but there has been a lot happening over the past 4-5 days. Last week we tried a number of tests using the NaOH, alone and in combination with a polyaluminum chloride coagulant (AL) and a polyacrylamide flocculant (AC). The results were disappointing. We achieved minor particle formation using straight NaOH (after the oxidizer) but only after getting the pH up to about 11.5. This obviously is not acceptable. Results using NaOH plus AC, and NaOH plus AL, also resulted in excessively high pH. We then tried using AL and AC together, and not much happened. However, when we used the AL first, then the oxidizer, then the AC, we got really good results. Large visible floc particles formed and settled in a matter of minutes. Analysis of the supernate came back at 0.5 total iron. Based on the bench test application rates we ran to SLC and bought another injection pump to begin full-scale testing. We tested all day Tuesday and Wednesday to verify the results, and now are confident we have a workable plan that should insure compliance. Based on the field tests we found good results using about 150 ppm of the AL and 6ppm of the AC. I have attached the MSDS sheet for the Nalco AL product (8158) we intend to use. As you can see the NSF 60 rating is 250, so we are in good shape there. Also the ecotoxicological data is positive. As for the AC product (Nalco 7763), the concern was the 1 mg/L (ppm) NSF 60 limit. Based on the fact that we now believe that most of the AC will drop out with the iron floc, and the fact that Crandall and Huntington Creek add considerable dilution to the pond discharge, we are comfortable that we are good with the AC application rate as well. We are now getting set up to start a continuous run of the system starting Monday of next week. We have ordered sufficient AL and AC to get us through the next three weeks of testing. We have made arrangements with the Nalco lab in Naperville, IL to begin sending them discharge samples on a daily basis starting on Monday. We should be able to get about 3 day turn-around time on the AC titration results. We will continue this sampling/testing until everyone has a good comfort level of the results. Also, the Nalco folks are in the process of assembling the apparatus to set up a field lab at the mine to do the titration test. We hope to have this setup in place and operational in the first week of April. Also, the water lab in Price can do the aluminum test for the AL to make sure we are within the NSF 60 criteria. I would like to invite everyone who is interested to come by the mine next week to observe the results of the test run. Dana will be keeping very complete notes of the test run over the next several weeks which we will send out to everyone on a frequent schedule. I appreciate everyone who has added insight to this process, and would like to venture that I see light at the end of this long tunnel (fingers crossed). Please feel free to call me if you have any questions. Also, please distribute this email to any others in your group who may be interested. Thanks

Dave



## SAFETY DATA SHEET

### PRODUCT

**NALCO® 8158**

EMERGENCY TELEPHONE NUMBER(S)  
(800) 424-9300 (24 Hours) CHEMTREC

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **NALCO® 8158**  
APPLICATION : **WATER CLARIFICATION AIDCOAGULANT, FLOCCULANT**  
COMPANY IDENTIFICATION : **Nalco Company  
1601 W. Diehl Road  
Naperville, Illinois  
60563-1198**

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

#### NFPA 704M/HMIS RATING

HEALTH : 2/2 FLAMMABILITY : 0/0 INSTABILITY : 0/0 OTHER :  
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme \* = Chronic Health Hazard

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Aluminum Chloride Hydroxide Sulphate	39290-78-3	30.0 - 60.0

### 3. HAZARDS IDENTIFICATION

#### \*\*EMERGENCY OVERVIEW\*\*

#### WARNING

Irritating to eyes.

Do not get in eyes, on skin, on clothing. Do not take internally. Keep container tightly closed. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Protect product from freezing.

Wear suitable protective clothing, gloves and eye/face protection.

Not flammable or combustible. Contact with reactive metals (e.g. aluminum) may result in the generation of flammable hydrogen gas. May evolve HCl under fire conditions. May evolve oxides of carbon (COx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :  
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :  
Irritating, and may injure eye tissue if not removed promptly.

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### SKIN CONTACT :

May cause irritation with prolonged contact.

### INGESTION :

Not a likely route of exposure. There may be irritation to the gastro-intestinal tract with nausea and vomiting. May cause liver and kidney effects and/or damage. May be harmful if swallowed.

### INHALATION :

Not a likely route of exposure. Aerosols or product mist may irritate the upper respiratory tract.

### SYMPTOMS OF EXPOSURE :

#### Acute :

A review of available data does not identify any symptoms from exposure not previously mentioned.

#### Chronic :

A review of available data does not identify any symptoms from exposure not previously mentioned.

### AGGRAVATION OF EXISTING CONDITIONS :

A review of available data does not identify any worsening of existing conditions.

### HUMAN HEALTH HAZARDS - CHRONIC :

No adverse effects expected other than those mentioned above.

## 4. FIRST AID MEASURES

### EYE CONTACT :

Immediately flush eye with water for at least 15 minutes while holding eyelids open. If irritation persists, repeat flushing. Get medical attention.

### SKIN CONTACT :

Flush affected area with water. If symptoms persist, call a physician. Remove contaminated clothing. Wash clothing before reuse.

### INGESTION :

Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink. Never give anything by mouth if victim is rapidly losing consciousness, is unconscious or convulsing. Get medical attention.

### INHALATION :

Remove to fresh air, treat symptomatically. Get medical attention.

### NOTE TO PHYSICIAN :

Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

## 5. FIRE FIGHTING MEASURES

FLASH POINT :

None



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### EXTINGUISHING MEDIA :

Not expected to burn. Keep containers cool by spraying with water. Use extinguishing media appropriate for surrounding fire.

### FIRE AND EXPLOSION HAZARD :

Not flammable or combustible. Contact with reactive metals (e.g. aluminum) may result in the generation of flammable hydrogen gas. May evolve HCl under fire conditions. May evolve oxides of carbon (COx) under fire conditions.

### SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

## 6. ACCIDENTAL RELEASE MEASURES

### PERSONAL PRECAUTIONS :

Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

### METHODS FOR CLEANING UP :

**SMALL SPILLS:** Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. **LARGE SPILLS:** Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

### ENVIRONMENTAL PRECAUTIONS :

Do not contaminate surface water.

## 7. HANDLING AND STORAGE

### HANDLING :

Avoid eye and skin contact. Do not take internally. Do not get in eyes, on skin, on clothing. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled. Keep the containers closed when not in use. Use with adequate ventilation.

### STORAGE CONDITIONS :

Store the containers tightly closed. Store in suitable labeled containers. Store separately from bases. Keep at temperatures between 10 °C - 30 °C

### UNSUITABLE CONSTRUCTION MATERIAL :

Product is corrosive to aluminum. Aluminum should not be used for feed, storage, or transportation systems.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### OCCUPATIONAL EXPOSURE LIMITS :

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.





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FREEZING POINT	-12 °C
BOILING POINT	216 °F / 102 °C
VAPOR PRESSURE	Same as water
VOC CONTENT	0.00 % EPA Method 24

Note: These physical properties are typical values for this product and are subject to change.

### 10. STABILITY AND REACTIVITY

**STABILITY :**  
Stable under normal conditions.

**HAZARDOUS POLYMERIZATION :**  
Hazardous polymerization will not occur.

**CONDITIONS TO AVOID :**  
Avoid extremes of temperature.

**MATERIALS TO AVOID :**  
Contact with strong alkalis (e.g. ammonia and its solutions, carbonates, sodium hydroxide (caustic), potassium hydroxide, calcium hydroxide (lime), cyanide, sulfide, hypochlorites, chlorites) may generate heat, splattering or boiling and toxic vapors. Contact with reactive metals (e.g. aluminum) may result in the generation of flammable hydrogen gas. Mineral Acids

**HAZARDOUS DECOMPOSITION PRODUCTS :**  
Under fire conditions: HCl, Oxides of sulfur, Oxides of aluminum

### 11. TOXICOLOGICAL INFORMATION

No toxicity studies have been conducted on this product. The following results are for a similar product.

**ACUTE ORAL TOXICITY :**  
Species: Rat  
LD50: >5 g/kg  
Test Descriptor: Similar Product

**ACUTE DERMAL TOXICITY :**  
Species: Rabbit  
LD50: >2 g/kg  
Test Descriptor: Similar Product

**CARCINOGENICITY :**  
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).



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#### HUMAN HAZARD CHARACTERIZATION :

Based on our hazard characterization, the potential human hazard is: Low

## 12. ECOLOGICAL INFORMATION

#### ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

#### ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Rainbow Trout	96 hrs	300 mg/l	Product
Fathead Minnow	96 hrs	360 mg/l	Product
Gold Orfe	96 hrs	750 mg/l	Product

#### ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs	> 1,000 mg/l		Similar Product

#### PERSISTENCY AND DEGRADATION :

Total Organic Carbon (TOC) : 1,080 mg/l

Chemical Oxygen Demand (COD) : 1,660 mg/l

#### ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: Low

Based on our recommended product application and the product's characteristics, the potential environmental exposure is: Low

If released into the environment, see CERCLA/SUPERFUND in Section 15.

## 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: D002

Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.



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### 14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

#### LAND TRANSPORT :

Proper Shipping Name :	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical Name(s) :	ALUMINUM CHLORIDE HYDROXIDE SULPHATE
UN/ID No :	UN 3264
Hazard Class - Primary :	8
Packing Group :	III
Flash Point :	None

#### AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical Name(s) :	ALUMINUM HYDROXYCHLORIDE
UN/ID No :	UN 3264
Hazard Class - Primary :	8
Packing Group :	III
IATA Cargo Packing Instructions :	820
IATA Cargo Aircraft Limit :	60 L (Max net quantity per package)

#### MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical Name(s) :	ALUMINUM HYDROXYCHLORIDE
UN/ID No :	UN 3264
Hazard Class - Primary :	8
Packing Group :	III

### 15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

#### NATIONAL REGULATIONS, USA :

##### OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Aluminum Chloride Hydroxide Sulphate : Eye irritant, Exposure Limit - Compound Class



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CERCLA/SUPERFUND, 40 CFR 117, 302 :

Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :

This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

- |   |                                   |
|---|-----------------------------------|
| X | Immediate (Acute) Health Hazard   |
| - | Delayed (Chronic) Health Hazard   |
| - | Fire Hazard                       |
| - | Sudden Release of Pressure Hazard |
| - | Reactive Hazard                   |

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :

This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :

When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 176.170 Components of paper and paperboard in contact with aqueous and fatty foods and 21 CFR 176.180 Components of paper and paperboard in contact with dry foods.

Product must be used at a pH above 5.5 to retain its FDA status. Limitations: no more than required to produce intended technical effect.

NSF INTERNATIONAL :

This product has received NSF/International certification under NSF/ANSI Standard 60 in the coagulation and flocculation category. The official name is "Polyaluminum Chloride." Maximum product application dosage is : 250 mg/l.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

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**CLEAN AIR ACT, Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :**

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

**CALIFORNIA PROPOSITION 65 :**

Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.

**MICHIGAN CRITICAL MATERIALS :**

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

**STATE RIGHT TO KNOW LAWS :**

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

**NATIONAL REGULATIONS, CANADA :**

**WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

**WHMIS CLASSIFICATION :**

E - Corrosive Material

**CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :**

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

**EUROPE**

The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

**16. OTHER INFORMATION**

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

\* The human risk is: Low

\* The environmental risk is: Low

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.



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This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

### REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department  
Date issued : 07/31/2009  
Version Number : 2.1