SUPPLY CHAIN REQUEST FOR SIGNATURE SHEET

To: John Young
From: Gerald Coyne
Telephone: 856-727-6219
Email: gerald.coyne@amwater.com
Date: 11-21-2007

Re: Agreement to Supply Potable Water Treatment Chemicals for 2008

I. Category Name: Water Treatment Chemicals (Kemira Water)

II. Monetary Value of Agreement (approximate annual spend or anticipated total spend for project) 1,500,000.00

III. Term of Agreement: 5 years for T&C's 1 year for pricing

IV. Category/Project Team Members:
Category Champion - John Young
Category Leads – Regional Directors of Operations
Supply Chain Lead – Gerald Coyne

V. Agreement Reviewed by:
Steve Robbins
Greg Samuels
Gerald Coyne

VI. Detailed summary of the attached Agreement: Water Treatment Chemical contract for 2008/2013 term. Supplier did not make any changes to the document

REMINDER—BLUE INK IS REQUIRED FOR ALL SIGNATURES

CONTRACT APPROVAL FORM

Section I: General Contract Information

☐ CHECK THIS BOX IF THIS IS AN AMERICAN WATER STANDARD CONTRACT (NO CHANGES MADE)

1) Contract Name*: Agreement to Supply Potable Water Treatment Chemicals for 2008 Kemira Water Solutions

2) Contract Number: _____

3a) Contract Owner* Gerald Coyne Phone number*856-727-6219

3b) Contract Owner taking responsibility after the contract is signed (if different than original Contract Owner):

_____ Phone number _____

4) Secondary contact name and phone number _____

5) Physical location of document(s) (office location and department name)* Mount Laurel

6) Name of the American Water company entering into the contract*: American Water Works Service Co., Inc.

7) Other company or companies signing the contract*: _____

8) Contract description*: Chemicals

9) Relationship to other contracts (amendment, change order with new terms, etc.)* N/A

10a) Estimated Lifetime Contract Payments*: $1,500,000.00

10b) Estimated Lifetime Contract Receipts* $_____

Estimated Lifetime Contract Payments should be expressed in gross

11) Effective Date*: 01/01/2008

12) Renewal terms* (check one): ☐ Perpetual unless cancelled ☐ Annual automatic renewal unless cancelled ☐ Monthly automatic renewal unless cancelled ☐ Not renewable ☐ Renewable with prior notice (notice date: _____/_____/_____) ☐ Other (describe on item 15)

13) Termination Date*: 12/31/2013

14) Termination provisions* (check all that apply): ☒ At-will by either party ☐ At-will by AW only ☐ At-will by other party only ☐ For cause by either party ☐ For cause by AW ☐ For cause by other party ☐ No termination provisions in contract

15) Miscellaneous Notes:_____

*Mandatory information

CONTRACT APPROVAL FORM

16) Contract Type* (check only one box):

NOTE: See Appendix 1 for a description of each contract type
Contract types marked with an "F" require the prior input and approval of the Finance Department
Contract types marked with an "F$" require the prior input and approval of the Finance Department if the total value exceeds $100,000
Contract types marked with a "P" require the prior input and approval of the Supply Chain Department
See Instructions for description of approval process

☐	(F)(P)	Benefit/Pension Agreement	☐	(F)	Joint Venture Agreement
☐		Billing/Shut-Off Agreement	☐		Labor Agreement
☐	(F)	Debt/Securities Agreement	☐	(F$)(P)	Lease Agreement
☐		Confidentiality Agreement	☐	(P)	License Agreement
☐	(F$)	Construction Agreement	☐	(F)	Merger/Acquisition/Disposition Agreement
☐		Developer Service/Main Extension Agreement	☐	(F)	Miscellaneous Agreement
☐	(F)	Operating Agreement			
☐	(F$)	Easement Agreement	☐	(F$)(P)	Purchase/Sale Agreement
☐	(F)	Employment Agreement	☐		Rate Agreement
☐	(F)	Environmental Agreement	☐	(F$)(P**)	Services Agreement
☐	(F)	Financial Agreement	☐	(F)	Settlement Agreement
☐		Fire Protection Agreement	☐	(P)	Supply Agreement
☐	(F)	Franchise Agreement	☐	(F)	Water Supply/Wastewater Agreement

**- Only when the company is receiving the services

17) If the contract contains a payment commitment by AW in future years (such as a long-term supply agreement lease), fill out the following schedule*:

Year	Commitment Amount (in $'s)
2007	
2008	
2009	
2010	
2011	
2012	
2013	
2014	

Year	Commitment Amount (in $'s)
2015	
2016	
2017	
2018	
2019	
2020	
2021	
2022 and beyond	

*Mandatory information

CONTRACT APPROVAL FORM

Section II: Approvals

Kemira

Business Unit Review:

CONTRACT OWNER*

(Name)	(Signature)	(Date)

By checking this box, Contract Owner represents he/she has reviewed the Delegation of Authority and is authorized to sign the contract: ☐

CONTRACT SIGNER (only if Contract Owner does not have authority to sign contract pursuant to the DOA; see instructions)

(Name)	(Signature)	(Date)
John S. Young		2.17.08

Comment (use back if necessary)

Law Department Review by:

ATTORNEY*

(Name)	(Signature)	(Date)
		2/8/08

Comment (use back if necessary)

Finance Department Review by:

(Name)	(Signature)	(Date)

Check box if Finance Department review is not required: ☐

Comment (use back if necessary)

Supply Chain Department Review by:

(Name)	(Signature)	(Date)
Gerald Coyne		10-26-07

Check box if Supply Chain Department review is not required: ☐

Comment (use back if necessary)

*Mandatory Information

CONTRACT APPROVAL FORM

Section II: Approvals

Business Unit Review:

CONTRACT OWNER*

Comment (use back if necessary)

_____ (Name) _____ (Signature) _____ (Date)

By checking this box, Contract Owner represents he/she has reviewed the Delegation of Authority and is authorized to sign the contract: ☐

CONTRACT SIGNER (only if Contract Owner does not have authority to sign contract pursuant to the DOA; see instructions)

_____ (Name) _____ (Signature) _____ (Date)

Law Department Review by:

ATTORNEY*

Comment (use back if necessary)

_____ (Name) _____ (Signature) _____ (Date)

Finance Department Review by:

Comment (use back if necessary)

_____ (Name) _____ (Signature) _____ (Date)

Check box if Finance Department review is not required: ☐

Supply Chain Department Review by:

Comment (use back if necessary)

Gerald Coyne (Name) (Signature) **10-26-07** (Date)

Check box if Supply Chain Department review is not required: ☐

*Mandatory information

Basic Contract Approval Process

See full instructions below for definitions and explanations.

ndard Contracts:

1. The Contract Owner fills in the blanks on the standard contract form and makes no other changes to the contract.
2. The Contract Owner and other party sign the contract.
3. The Contract Owner completes and signs the Contract Approval Form. One Contract Approval Form may cover multiple contracts for a given time period (contact the regional Law Department for specific procedure).
4. The Contract Owner scans the Contract Approval Form and the contract into .pdf format and transmits both (as separate files) to the regional Law Department (contact the regional Law Department for specific procedure). If one Contract Approval Form is used to cover multiple contracts, each contract must be scanned as a separate file.
5. The original signed contract is maintained per existing document retention policies.

Non-Standard Contracts

1. The Contract Owner contacts the Law Department for assistance with negotiating and reviewing the contract.
2. The Contract Owner determines whether the Finance Department and/or the Supply Chain Department are required to review and approve the contract before it is signed (see the Contract Approval Form for contract types and required approvals).
3. The Contract Owner notifies the Finance Department and/or Supply Chain Departments if required.
4. The Contract Owner, lawyer(s) and appropriate Finance Department and/or Supply Chain Department personnel negotiate and review the contract.
5. The Contract Owner completes and signs the Contract Approval Form.
6. If the Contract Owner does not have authority to sign the contract pursuant to the Delegation of Authority, a Contract Signer must also sign the Contract Approval Form.
7. The Contract Owner distributes the Contract Approval Form and final form of agreement to the lawyer and the finance personnel and/or supply chain personnel responsible for reviewing the contract, as required.
8. The lawyer, finance personnel and supply chain personnel responsible for reviewing the contract review and approve the contract, sign the Contract Approval Form and return the signed Contract Approval Form to the Contract Owner.
9. The Contract Owner (or Contract Signer) and the other party sign the contract.
10. The Contract Owner scans the Contract Approval Form and the contract into .pdf format and transmits both (as separate files) to the regional Law Department (contact the regional Law Department for specific procedure).
11. The original signed contract is maintained per existing document retention policies.

Instructions for use of Contract Approval Form

Before any contract can be entered into on behalf of any American Water entity, this Contract Approval Form must be properly completed and signed by the persons described below. Once the contract is signed by all parties, a copy of the contract and this completed form must be scanned into .pdf format (as separate files) and sent to the Law Department for indexing. Consult with your regional Law Department with respect to filing/storage of the physical document and scanning procedures. The index will be used by the Finance Department to identify the contracts necessary to compile the company's financial statements and other disclosure obligations.

This form must be used for all contracts, amendments to existing contracts, and any "statements of work" or "change orders" that change the obligations of the parties to the contract. For example, a statement of work that describes the specific obligations of the parties that are referred to generally in the contract, but does not change the amounts or timing of any payments under the contract does not require a new Contract Approval Form and process. A statement of work that describes the specific obligations of the parties, but increases or for the first time specifies the amount of payments due under the contract, or changes the payment schedule from weekly to monthly would require a new Contract Approval Form and process.

All contracts must be reviewed and approved in accordance with the Delegation of Authority ("DOA") and the Code of Ethics. All contracts that are not pre-approved standard contracts must be reviewed by an attorney in the Law Department. All contract types marked "F" below must be reviewed by a member of the Finance Department. All contract types marked "F$" must be reviewed by a member of the Finance Department if the total lifetime payments for the contract (item 10a below) exceeds $100,000. All contract types marked "P" must be reviewed by a member of the Supply Chain Department.

The Law Department has created certain pre-approved standard contract forms with some terms left blank. If you are using one of these pre-approved standard contract forms and no changes are made to the form except for filling in the blanks, unless the total value of the contract exceeds $100,000, Law Department review and approval is NOT required before the parties sign the contract. If you are not sure if the contract you are using is a pre-approved standard contract form, consult the Law Department. Standard contracts still need to be collected and sent to the Law Department. Consult the Law Department for specific transmittal procedures for standard contracts.

For purposes of American Water contract administration policies and practices, contract review requires the active participation of the Law, Finance or Supply Chain Department reviewer in establishing the terms of the contract relevant to their area of expertise. The level of involvement by a Law, Finance or Supply Chain Department reviewer, when applicable, is determined by Law, Finance and Supply Chain Department policies and practices. Only Law Department personnel are authorized to engage outside counsel to assist in the negotiation or review of a contract. Contract owners must contact the Law Department and Supply Chain Department (if Supply Chain Department review is required) before any negotiation of terms occurs to determine the extent to which those departments will be involved in the negotiation process and when that will occur. Failure to do this may result in a termination of contract negotiations. Contract owners should also contact the Finance Department early in the contracting process if the contract type requires Finance Department review and approval prior to signing the contract.

The contract owner (who is identified in item 3a) is responsible for obtaining all necessary reviews and approvals well before signing the contract. By signing the Contract Approval Form, the contract owner acknowledges that he or she: (1) has primary responsibility for negotiating and agreeing to the terms of the contract, and (2) has followed all American Water policies and practices (including the Code of Ethics) that apply regarding the subject matter of the contract. Unless otherwise indicated on the Contract Approval Form, the contract owner is responsible for managing the company's obligations under that contract. If the contract owner will not be responsible for managing the company's obligations under the contract after it is signed, the person who will have such responsibility must be named on the Contract Approval Form (see item 3b).

If the contract owner does not have authority under the DOA to sign the contract, the contract owner must obtain the approval of another employee in their business unit that has sufficient authority to sign the contract. This second employee is the "contract signer". By signing the Contract Approval Form, the contract signer

acknowledges that he or she is the proper party to approve and physically sign the contract pursuant to the DOA and all other American Water policies and practices regarding the subject matter of the contract.

The Law Department reviewer is the attorney responsible for providing advice and counsel to the contract owner regarding legal issues related to the contract. By signing the Contract Approval Form, the attorney acknowledges that he or she reviewed the contract in a manner consistent with Law Department policies and practices in that attorney's judgment. An attorney may use one Contract Approval Form to approve several standard contracts at the same time if the standard contracts comply with the Law Department's procedures established for standard contracts.

The Finance Department reviewer, if required, is responsible for providing financial advice to the contract owner and acting as an interface with the Finance Department, so that the Finance Department can take appropriate actions with respect to the completion of the contract. By signing the Contract Approval Form, the Finance Department reviewer acknowledges that he or she reviewed the contract and relayed any accounting or finance issues to the Finance Department or other required department in a manner consistent with Finance Department policies and practices.

The Supply Chain Department reviewer, if required, is responsible for confirming that the contract was negotiated and entered into in a manner consistent with Supply Chain Department policies and practices. By signing the Contract Approval Form, the Supply Chain Department employee acknowledges that he or she participated in the negotiation of the contract and that the contract was entered into in a manner consistent with Supply Chain Department policies and procedures.

EXHIBIT A

CONTRACT TYPE DEFINITIONS

The following is the list of contract types to be used on the Contract Approval Form, along with representative examples of the types of contracts that will fit under those types. The contract types are meant to be broad categories and the descriptions and lists that follow are meant to serve as guides. Designating a contract under an inappropriate specific contract type for the sole purpose of avoiding Finance or Supply Chain Department review is strictly prohibited. If in doubt as to which contract type to use, consult with your Law Department reviewer.

All non-standard contracts must be reviewed by an attorney in the Law Department (See Instructions).

Contract types marked with an "F" require the prior input and approval of the Finance Department.

Contract types marked with an "F$" require the prior input and approval of the Finance Department if the total value exceeds $100,000.

Contract types marked with a "P" require the prior input and approval of the Supply Chain Department.

See Instructions for a complete description of the approval process.

Contract Type	Description
Benefit/Pension Agreement (F)(P)	All contracts relating to employee benefits, such as 401(k) management, pension management, health insurance group contracts, union benefit/pension agreements
Billing/Shut-Off Agreement	Usage data, termination and customer billing agreements
Debt/Securities Agreement (F)	Agreements relating to the issuance of debt or securities by the company to non-affiliates, generally in a capital raising or refinancing transaction; includes related underwriting and placement agreements; does not include intercompany agreements
Confidentiality Agreement	Stand-alone non-disclosure or confidentiality agreements, such as related to an RFP or acquisition transaction
Construction Agreement (F$)	New projects; includes prime contractor and subcontractor agreements; does not include main extension agreements or outsourced maintenance or repair provider contracts
Developer Service/Main Extension Agreement	All Developer Service or Main Extension Agreements
Easement Agreement (F$)	All Easement Agreements
Employment Agreement (F)	Individual employment agreements, termination agreements and severance agreements; does not include union/collective bargaining or pension/benefit agreements

Contract Type	Description
Environmental Agreement (F)	Agreements with governmental authorities; does not include agreements to provide remediation services, testing, consulting or professional service agreements
Financial Agreement (F)	Agreements dealing with the company's internal financing, such as intercompany loan or capital contribution arrangements, agreements to purchase or sell securities held for investment; does not include variable interest investments (FIN 46) or joint ventures
Fire Protection Agreement	All Fire Protection Agreements
Franchise Agreement (F)	Agreement or municipal ordinance under which the company receives the right or consent of a particular town or city to provide water or wastewater service to customers located in the town or city (or a part thereof)
Joint Venture Agreement (F)	Variable interest investments (FIN 46), non-consolidated investments
Labor Agreement	Union/collective bargaining contracts and related agreements; arbitration agreements/settlements; does not include union benefit/pension agreements
Lease Agreement (F$)(P)	Real estate and equipment leases, including capital leases; includes agreements where the company is either lessor/landlord or lessee/tenant
ense Agreement (F)	Software and other intellectual property agreements; does not include "shrink-wrap" software licenses or licenses to software incidental to other equipment
Merger/Acquisition/Disposition Agreement (F)	Purchase or sale of businesses, including water or wastewater system assets in the aggregate, and related agreements (letters of intent, bills of sale, assignment and assumption agreements, etc.)
Miscellaneous Agreement (F)	To be used very sparingly and only if no other category is relevant
Operating Agreement (F)	O&M, Design-Build-Operate and other agreements to operate systems owned by others; does not include subcontracts with third parties to provide services to the company
Purchase/Sale Agreement (F$)(P)	Individual purchase or sale of a specific asset not related to a joint venture or merger/acquisition/disposition, such as real estate or a single piece of equipment
Rate Agreement/Stipulation	All contracts dealing with rate issues, e.g. rate orders, stipulations, rate case consultants, etc.

Contract Type	**Description**
Services Agreement (F$) only if company is receiving the services	Includes agreements where the company is providing specialized services to customers and agreements where the company is engaging outside consulting firms or individuals, such as law firms, architects, etc., or purchasing services such as maintenance, outsourced construction/repair, janitorial, printing, travel, etc.; does not include such agreements relating to rate cases
Settlement Agreement (F)	Settlement of legal claims, including releases and court orders; does not include settlements involving rate cases
Supply Agreement (P)	Supply agreements negotiated by Supply Chain Department
Water Supply/Wastewater Agreement (F)	Bulk purchase or sale, sale for resale and wholesale agreements; wastewater treatment agreements

TO: Kemira Water Solutions, Inc.

Agreement to Supply Potable Water Treatment Chemicals For 2008

THIS AGREEMENT is dated as of the 1st day of January in the year 2008, by and between:

American Water Works Service Company, Inc.
1025 Laurel Oak Road
P.O. Box 1770
Voorhees, NJ 08043

(hereinafter called Services)

and

Kemira Water Solutions, Inc.
3211 Clinton Parkway Court
Lawrence, KS 66047

(hereinafter called Chemical Supplier)

Agreement to Supply Potable Water Treatment Chemicals – 2008

Recitals

A. Services desires to purchase from time to time certain Chemicals to be used in water treatment by certain of its affiliates (Users); and

B. Chemical Supplier agrees to provide certain chemicals set forth in Exhibit A (Chemicals) to the Users in accordance with the terms of this Agreement.

NOW, THEREFORE, Services and Chemical Supplier, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. PURCHASE TERMS

1.1 Chemical Supplier shall supply and deliver each chemical specified in the purchase order supplied by the User locations at the prices set forth in Exhibit A or as otherwise agreed upon in an amended Exhibit A, and in such quantities as Services may from time to time specify on such purchase orders. The quantities set forth are estimates only, and Services reserves to the right to order more or less than such quantities.

1.2 The Chemicals provided and delivery thereof shall comply with applicable User's requirements and specifications contained in this Agreement, including but not limited to User's delivery requirements.

1.3 The term of this Agreement is from 01/01/2008 until 12/31/2013. Exhibit A, which is attached hereto and incorporated into this Agreement in its entirety, contains the prices of all Chemicals, as well as the period(s) of time in which the prices for such Chemicals will be valid. Any price changes will be incorporated into this Agreement in accordance with Section 10.13 of this Agreement.

1.4 Chemical Supplier represents and warrants that prices agreed upon shall be complete, and no additional charges of any type shall be added without Services' express written consent. All prices include, but are not limited to, charges for shipping, delivery, packaging, labeling, custom duties, taxes, storage, insurance, boxing, and crating. Chemical Supplier will not charge Services or User for any demurrage fees or cylinder deposits.

1.5 The terms contained in this Agreement (a) are the sole and exclusive terms governing the purchase, sale and delivery of the Chemicals, and (b) supersede any prior terms, representations and warranties relating to the purchase, sale and delivery of the Chemicals. Services and Chemical Supplier acknowledge and agree that it is essential to this Agreement that only the terms contained herein govern the purchase, sale and delivery of the Chemicals, to the exclusion of any different or additional terms contained in any forms or documents sent by either party to the other or that accompany shipment. If Chemical Supplier includes or attaches any different or additional terms in Chemical

Supplier's purported acceptance, commences performance, or tenders the Chemicals, only the terms and conditions as stated herein, without inclusion of any different or additional terms and conditions, shall govern the purchase, sale and delivery of the Chemicals.

1.6 All Chemicals furnished must strictly conform to the Contract Documents and must be of the quality specified. No deviation or substitution is permitted without the prior written consent of Services. In the event no quality is specified, the Chemicals must be at least equal to American Water Works Association (AWWA) standards. Services shall have the right at all times during the term of this Agreement to conduct such tests and inspections as it deems necessary to assure Chemical Supplier's compliance with this Agreement. Chemical Supplier will supply to Services, as requested by Services, data, specifications, test results, quality documentation, schedules, and other documents and information relating to the Chemicals and this Agreement.

ARTICLE 2. CHEMICAL SUPPLIER'S REPRESENTATIONS AND AGREEMENTS RELATING TO THE CHEMICALS

In order to induce Services to enter into this Agreement, Chemical Supplier makes the following representations and agreements:

2.1 Chemical Supplier has familiarized itself with the nature and extent of the Contract Documents, site locality, all local conditions and all laws and regulations that in any manner may affect cost, progress, performance or furnishing and delivering of the Chemicals.

2.2 Chemical Supplier will provide an affidavit of compliance with National Sanitation Foundation (NSF) chemical certification (or equivalent) to Services upon request, as well as a "letter of guaranteed supply" by the manufacturer of the Chemicals, that will confirm that Chemical Supplier has committed sufficient quantities of Chemicals to cover Services' annual requirement as set forth in Exhibit A. Polymer suppliers must also complete the Polymer Certification Form in Exhibit B, which is attached hereto and incorporated into this Agreement in its entirety.

2.3 When Chemicals purchased hereunder are to be manufactured or produced outside the United States or its territories, Chemical Supplier shall furnish at Services' request documents stating the foreign manufacturers' or producers' names and addresses, and containing written assurances of compliance with U.S.A. standards.

2.4 Chemical Supplier has supplied a "product specification sheet", which is attached hereto as Schedule 1 and is incorporated by reference herein, that lists the chemical purity, maximum concentrations of impurities, as well as the chemical properties and physical properties of each Chemical that is to be provided hereunder. During the term of the Agreement, no deviation from that product specification sheet will be permitted, and, upon request, Chemical Supplier will provide Services with periodic quality control reports detailing Chemical quality.

2.5 Chemical Supplier shall furnish to Services a load-specific "Certificate of Analysis" of each Chemical. Chemical Supplier must either fax a copy of the "Certificate of Analysis" to each specific User prior to delivery of the Chemicals or provide User with the "Certificate of Analysis" at each delivery. No Chemical deliveries will be accepted without a "Certificate of Analysis."

2.6 The cost of supplying and testing of corrosion coupons for field-testing of corrosion rates of Chemicals used for corrosion control purposes shall be included in the Chemical prices as outlined in Exhibit A.

2.7 Chemical Supplier shall provide the technological data required for regulatory compliance as defined by OSHA Hazard Communications Standard, 29 CFR 1910.1200; Toxic Substances Control Act Regulations, 40 CFR 710; CERCLA and SARA regulations, 40 CFR 355, 370, 372, 1990 Clean Air Act Amendments, Title III Hazardous Air Pollutants Section 112 (r) Prevention of Accidental Releases, and Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986.

ARTICLE 3. RESPONSIBILITIES OF SERVICES AND USERS

3.1 A User shall notify Chemical Supplier at least three (3) days in advance of required deliveries unless otherwise agreed upon in writing.

3.2 A User shall provide access to the appropriate locations to permit Chemical Supplier to make deliveries in accordance with the terms of this Agreement.

3.3 Services reserves the right of each User to test any delivery prior to unloading. The chemical truck driver is required to obtain a representative sample of Chemicals from the delivery vessel(s) prior to unloading. The delivered Chemical will be checked by the User for clarity, purity, specific gravity, and exact type of Chemical being received. Authorization to unload the Chemical shall be contingent upon this testing.

3.4 Services, or any User on Services' behalf, reserves the right to refuse any and all shipments if the Chemicals are not properly identified, packaged, labeled, or accompanied by the proper certificate of analysis or weight tickets, or if the Chemicals do not meet specifications.

3.5 If at any time in the opinion of Services or any User, the delivery is not properly lighted, barricaded and safe with respect to public travel, persons on or about the work site or public or private property, Services or such User shall have the right to order such safeguards, and the cost of implementing such safeguards shall be borne by Chemical Supplier.

ARTICLE 4. AGREEMENTS OF CHEMICAL SUPPLIER RELATING TO DELIVERIES

4.1 Chemical Supplier shall not delegate or assign any obligation hereunder to any third party without the prior written consent of Services. If Services consents to the use of a third party in fulfillment of this Agreement, all sections application to Chemical Supplier are

applicable to the third party, and Chemical Supplier shall be responsible for the performance of such third party and shall indemnify and hold harmless Services and User from any loss, liability or damages related to this Agreement.

4.2 All transportation and delivery charges shall be borne by Chemical Supplier. Risk of loss of any Chemical shall not pass to Services until it is actually delivered, accepted, and secured in a User's storage facility in accordance with the terms hereof.

4.3 Chemical Supplier shall provide bulk liquid Chemical deliveries in transport vessels dedicated solely to the Chemical delivered and which have all appropriate licenses, permits and authorizations permitting such vessels to be used in the transport of such Chemicals in compliance with applicable environmental and transportation laws and regulations and in accordance with all additional delivery requirements contained in this Agreement. When dedicated Chemical transport vessels are not possible, the applicable User must be notified prior to delivery, and certified vessel cleaning certificates must be provided at the time of delivery. User may inspect the vehicle and/or tank car for anything unusual, such as broken seals and valves. Users may refuse the Chemical shipment if irregularities are identified.

4.4 Chemical Supplier shall furnish all necessary equipment to transfer from Chemical Supplier's delivery vehicles into the User's bulk storage vessels or onto the User's properties. Equipment shall include, but not be limited to, short bed delivery vehicles with tailgate lifts for unloading cylinders; dollies/hand trucks; chemical transfer hoses; and all miscellaneous fittings and connections necessary to permit the safe transfer of Chemicals to a User's facility. Chemical Supplier's transfer systems shall be so designed as to minimize the abrasion and loss of Chemicals during and after delivery. Chemical Supplier will ensure that the transfer system will be free of contaminants prior to delivery to User.

4.5 Chemical Supplier shall provide at least 24 hours' notice to the applicable User prior to delivery of any Chemicals, unless other arrangements are made with User and confirmed in writing. Chemical Supplier will specify the time and date of each delivery. Deliveries not in compliance with the agreed upon date and time may be refused by the User. Chemical Supplier shall also provide the following information to User via facsimile or email at least 24 hours prior to delivery of any Chemicals:

--Copy of Chemical Supplier delivery person's current driver's license;

--Chemical Supplier delivery vehicle's license plate number;

--Type and quantity of Chemical to be delivered; and

--Seal numbers (if applicable).

Upon arrival of the delivery vehicle, Users will verify the above information. Prior to acceptance of any delivery, the Chemical will be verified by User utilizing industry-accepted (such as AWWA) field tests. Deliveries with missing or inconsistent paperwork will be refused by User.

4.6 Chemical Supplier will make deliveries to the applicable User in strict compliance with Chemical Supplier's as well as all of the specific User's Chemical delivery policies and procedures. Deliveries not completed on a timely basis may result in termination of this Agreement. Should Chemical Supplier desire to make deliveries other than during User's normal business hours, Chemical Supplier shall make delivery arrangements satisfactory to the applicable User. Each such User may decline requests for such deliveries in its sole discretion.

4.7 Chemical Supplier agrees that it will be responsible for the repair of any damage to property caused by Chemical Supplier in delivering the Chemicals, whether to Services' or User's property or the property of third parties, and that any and all repairs to the property of Services, User, or any third party will be made at no cost to Services, User, or that third party.

4.8 Chemical Supplier will comply and, if it uses third party haulers or transportation companies, cause such haulers and transporters to comply, with all container and transportation requirements of the Hazardous Materials Transportation Act, 49 U.S.C. §1801 et. seq. and its regulations at 49 C.F.R. §§ 106-107 and 171-179.

4.9 Chemical Supplier will ensure that bulk deliveries of Chemicals are accompanied by a certified weight ticket, which will serve as the basis for payment when applicable.

4.10 Chemical Supplier will furnish all labels on the Chemical containers in compliance with the Hazardous Materials Transportation Act and the hazard communication provisions of the Occupational Safety and Health Act, 29 U.S.C. §§ 651 et seq. ("OSHA"), including furnishing all complete and accurate Material Safety Data Sheets ("MSDS's") for all Chemicals to be provided hereunder.

4.11 Chemical Supplier shall comply with all federal, state, and local transportation regulations that apply to the shipment of "hazardous materials," as defined or regulated by the Hazardous Materials Transportation Act, onto Services' or Users' properties.

4.12 Chemical Supplier shall pay for the clean-up and disposal of any spills and/or leaks during Chemical deliveries caused by Chemical Supplier, at no charge to Services or any User. Chemical Supplier shall clean-up and dispose of contamination resulting from any such leaks or spills at its sole cost and expense and in compliance with all federal, state and local environmental and transportation laws and regulations, and in a manner which restores the property to its condition prior to such leaks or spills. Furthermore, Chemical Supplier must obtain any local, state, or federal permits and/or approvals required for the disposal of any wastes generated during Chemical deliveries.

4.13 Chemical Supplier will provide for the removal of empty containers, drums, and cylinders, including those that contain residual materials or that have contained a hazardous material or hazardous material mixtures. Neither Services nor any User will be responsible for rinsing any used drums or containers. Chemical Supplier must collect

all empty cylinders, drums and pallets on a regular basis at no charge to Services or any User.

4.14 Chemical Supplier shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury, or loss to, employees, materials, equipment and property. During deliveries of Chemicals, Chemical Supplier will ensure that personal protective equipment shall be worn in accordance with its safety program as well as in accordance with the guidance provided on the Chemical's MSDS.

4.15 Services or any User may delay delivery or acceptance of any Chemicals occasioned by causes beyond its control. Chemical Supplier shall hold such Chemicals at the direction of Services and such User and shall deliver them when the cause affecting the delay has been removed. Services shall be responsible only for Chemical Supplier's direct additional transportation costs in returning the Chemicals to Chemical Supplier's facilities. Causes beyond Services' or any User's control shall include but not be limited to, acts of God or the public enemy, acts of terror or war, fire, flood, strike or other labor dispute directly affecting the obligations of the parties hereunder, civil disturbance, or omission by public authority or authorities having proper jurisdiction.

ARTICLE 5. HAZARDOUS CHEMICALS

5.1 In accordance with the intent of the Federal Occupational Safety and Health Administration, Standard Section 29 CFR 1910.1200, Hazard Communication with the effective date of May 25, 1986, Services hereby notifies Chemical Supplier that work is to be performed on company property where Chemical Supplier's (or its subcontractor's) employees may be exposed to hazardous materials existing on the premises. Chemical Supplier shall inform its employees and subcontractors of such conditions and ensure that they are adequately informed about the potential hazards of exposure to such Chemicals and are adequately trained to take appropriate precautions to protect against any harm or potential harm from exposure to such materials.

5.2 Hazardous chemicals known to be used or stored by the applicable Users are listed on Exhibit C, which is attached hereto and incorporated into this Agreement in its entirety.

5.3 Chemical Supplier represents and warrants that each chemical substance constituting or contained in the Chemicals sold or otherwise transferred to User hereunder is on the list of chemical substances compiled and published by the Environmental Protection Agency pursuant to the Toxic Substance Control Act, as amended. Chemical Supplier further represents and warrants that it has delivered, or at the time the first delivery of the materials is made to User Chemical Supplier agrees to deliver, to User any MSDS required to be provided to User pursuant to the applicable OSHA hazard communication standards contained in 29 CFR Chapter XVII, Part 1910.1200, as the same may be amended or supplemented from time to time.

ARTICLE 6. TAXES

6.1 Services will provide Chemical Supplier with either a direct pay permit for sales tax, an affidavit of sales tax exemption, or an affidavit that the water treatment Chemicals are exempt from sales tax.

ARTICLE 7. PAYMENT PROCEDURES

7.1 Chemical Supplier shall invoice Services when the Chemicals have been delivered. Chemical Supplier will include a lien waiver with each invoice. Each invoice shall include the following information 1) User name and specific location of delivery, 2) Chemical description and type of delivery, and 3) concentration and amount of delivery. Services shall not be responsible for payment on account of any refused shipment.

7.2 All invoices must be mailed directly to the American Water Shared Services Center for payment processing. Chemical Supplier must invoice the appropriate Users via U.S. mail in accordance with the table below:

Billing PO Boxes	
All invoices should be sent to the following address using the appropriate PO Box:	American Water PO Box "Use Box # Below" Cherry Hill, NJ 08034
PURCHASER	**PO BOX #**
American Water Service Company - (Hershey, Alton, Belleville, Pensacola, AM Water Corp.)	5614
Arizona American Water	5613
California American Water	5623
Elizabethtown Water *	5615
Hawaii American Water	5622
Illinois American Water	5626
Indiana American Water	5621
Iowa American Water	5624
Kentucky American Water	5610
Long Island American Water	5611
Maryland American Water	5612
Michigan American Water	5601
Missouri American Water	5605
New Jersey American Water	5602
New Mexico American Water	5604
Ohio American Water	5603
Pennsylvania American Water	5606
Tennessee American Water	5608
Texas American Water	5607
Virginia American Water	5625
West Virginia American Water	5609
AWE	1590

Payments shall be remitted to:

Kemira Water Solutions, Inc.
Dept. AT952344
Atlanta, GA 31192-2344

7.3 If a User disputes any invoice or a portion thereof, User shall not pay the disputed portion of such invoice until the parties have resolved such dispute in accordance with the dispute resolution process delineated in Section 10.16 of this Agreement. The undisputed portion of any invoice shall be paid as set forth herein.

7.4 If any undisputed fees remain unpaid sixty (60) calendar days after User's receipt of an invoice, Chemical Supplier will notify User in writing of the late payments and, in Chemical Supplier' discretion, the dispute resolution procedures delineated in Section 10.16 shall begin to resolve payment of such fees. If such matter remains unresolved following completion of the dispute resolution process delineated in Section 10.16, then the parties may resolve such dispute through litigation, the losing party bearing all costs of such litigation. All claims for money due or to become due from User shall be subject to deduction or set off by User by reason of this or any other transaction with Chemical Supplier or any User.

ARTICLE 8. INSURANCE

(a) At no expense to Services or User, Chemical Supplier shall **(1)** obtain and keep in force during the term of this Agreement, and any renewals or extensions hereof, and **(2)** require its subcontractors to obtain and keep in force during the terms of their respective contracts, the following minimum insurance limits and coverage. The insurance coverage limits stated below are minimum coverage requirements, not limitations of liability, and shall not be construed in any way as Service's acceptance of the responsibility of Chemical Supplier.

1. Commercial General liability:
   - $1,000,000 per occurrence Combined Single Limits
   - $1,000,000 General Aggregate
   - $1,000,000 Products and Completed Operations Aggregate
   - CGL ISO 1996 or later Occurrence form including Premises and Operations Coverage, Products and Completed Operations, Coverage for Independent contractors, Personal Injury Coverage and Blanket Contractual Liability, and Contractors Protective Liability if the Contractor subcontracts to another all or any portion of the Work. Completed Operations shall be maintained for a period of three (3) years following Final Completion for any construction, renovation, repair and or maintenance service.

2. Workers' Compensation

- Applicable Federal or State Requirements: Statutory Minimum
- Employer's Liability
- Each Accident $1,000,000
- Each Employee – Disease $1,000,000
- Voluntary workers compensation insurance coverage all employees not subject to applicable workers compensation act or acts

3. Automotive Liability (including owned, hired, borrowed and non-ownership liability)
   - Bodily Injury and Property Damage $1,000,000 each occurrence Combined Single Limits

4. Pollution Liability
   - Bodily Injury and Property Damage $5,000,000 each occurrence Combined Single Limits

5. Umbrella Liability
   - $9,000,000 each occurrence and annual aggregate in excess of Employer's Liability,
   - General Liability and Automotive Liability (no more restrictive than underlying insurance)

6. Chemical Supplier will maintain in full force and effect public liability insurance in the amount required by 49 CFR - Part 387 Subpart A (minimum levels of Financial Responsibility for Motor Carrier of Property in the amount of 5 million dollars.). A copy of the Auto Liability Policy's Form MC-90 shall be submitted with Chemical Supplier's certificate of insurance.

(b) The minimum liability limits required may be satisfied through the combination of the primary General Liability, Employers' Liability, and Automotive Liability limits with an Umbrella Liability policy (with coverage no more restrictive than the underlying insurance) providing excess limits at least equal to or greater than the combined primary limits.

All Commercial General Liability including completed operations-products liability coverage and Automotive liability insurance shall designate Services, its parent, affiliates and subsidiaries, its directors, officers and employees as an Additional Insured. All such insurance should be primary and non-contributory, and is required to respond and pay prior to any other insurance or self-insurance available to Services. In addition to the liability limits available, such insurance will pay on behalf or will indemnify Services for defense costs. Any other coverage available to Services applies on a contingent and excess basis. Such insurance shall include appropriate clauses pursuant to which the insurance companies shall waive its rights of subrogation against Services.

(c) Chemical Supplier and any of its subcontractors shall furnish, prior to the start of work, certificates or adequate proof of the foregoing insurance including, if specifically requested by Services, copies of the endorsements and insurance policies naming Services as an Additional Insured. Current certificates of insurance shall be provided prior to the commencement of work and shall be maintained until completion of the Agreement.

Chemical Supplier shall notify in writing, at least thirty (30) days prior to cancellation, of or a material change in a policy.

(d) Certificate holder is included as an additional insured with respect to liability arising out of the named insured's operations performed on behalf of holder. Excess policy follows form for Employers Liability, General Liability and Auto Liability Policies without exception and shall be indicated as such with an endorsement from the insurer. Waiver of Subrogation endorsement must accompany certificate of insurance and must include Workers' Compensation policies.

(e) Carriers providing coverage will be rated by A.M. Best with at least an A-rating and a financial size category of at least Class VII. Such cancellation or material alteration shall not relieve Contractor of its continuing obligation to maintain insurance coverage in accordance with this contract. Carriers shall be licensed in state(s) where work shall be performed.

(f) If Chemical Supplier shall fail to procure and maintain said insurance, Services, upon written notice, may, but shall not be required to, procure and maintain same, but at the expense of Chemical Supplier. In the alternative, Services may declare a default hereunder and, unless such default is timely cured, terminate the Agreement. Unless and until the default is cured, neither Chemical Supplier nor its servants, employees, or agents will be allowed to enter upon the Service's premises.

(g) Chemical Supplier must state on its Auto/Truck Certificate of Insurance that it has "no pollution exclusion for products they are transporting in its motor vehicles." If there is no "products pollution exclusion," then the Auto/Truck Liability policy must provide for waiver of subrogation and additional insured status as to Services and its Affiliates. Auto/Truck policy must also provide either blanket contractual liability coverage for contractual liability coverage specific to the product transport contract.

i. If the Chemical Supplier's Auto policy does contain a "pollution exclusion", then the Chemical Supplier must provide evidence on the Certificate of Insurance that it has obtained either (i) a "Hazardous Cargo Endorsement" on the current policy, or (ii) obtain a "Transporter's Environmental Impairment Liability" policy. With either of these items, the Certificate of Insurance must state that the endorsement or policy includes "loading and unloading activities."

ii. With respect to a Transporter's EIL policy or "Hazardous Cargo Endorsement", the limits of liability should not be less than $2,000,000 for any one occurrence.

iii. The "Environmental Impairment Liability" or "Hazardous Cargo Endorsement" coverage is to be written on an "occurrence:" basis. If the coverage can only be obtained on a "claims made" basis, then the Chemical Supplier must provide either one of the two following items:

- A contractual commitment, which becomes a part of the purchase contract that the Chemical Supplier will "renew the coverage in terms as great and as broad as presently held for at least the next five years", or

- A commitment on the Certificate of Insurance to provide an "extended reporting provision", also known as a "tail", on the coverage for a period of at least the next five years.

(h) A waiver of subrogation shall be provided to Services and its Affiliates on the Environmental Impairment Liability coverage. Services and its Affiliates shall also be added as "additional insureds" on this same coverage. This coverage must also contain either blanket contractual liability coverage or contractual liability coverage specific to the product transport contract.

ARTICLE 9. CONTRACT DOCUMENTS

The "Contract Documents" which comprise the entire Agreement between Services and Chemical Supplier concerning the Chemicals consist of:

9.1 This Agreement
9.2 Exhibit A -- Pricing
9.2 Exhibit B – Polymer Certification (attached)
9.3 Exhibit C – Hazardous Chemicals (attached)
9.4 Schedule 1 – Product Specification Sheets

ARTICLE 10. GENERAL

10.1 Indemnity

Chemical Supplier agrees to indemnify, defend, and hold harmless Services and each User, together with their respective directors, officers, employees and agents, from and against any and all claims, demands, losses, damages, actions, or liability of any kind, including attorneys' fees, arising out of or related to (i) the Chemicals provided under this Agreement or (ii) any breach of any representation or warranty or any other obligation of Chemical Supplier set forth in this Agreement by Chemical Supplier. Services or User shall (i) notify Chemical Supplier in writing about the raised claim in a timely manner; and (ii) authorize Chemical Supplier to lead and settle the legal proceedings (provided that no such settlement shall include an admission of liability or guilt by Services or User without Services' prior written consent) at Chemical Supplier's own cost, with Services and/or User providing reasonable cooperation and support as requested by Chemical Supplier.

10.2 Confidentiality

Chemical Supplier, on behalf of itself and its employees, agrees that any ideas, know-how, concepts, information, or processes received from Services or any User or created by Chemical Supplier in connection with the performance of this Agreement shall be the property of Services or User and shall be preserved in strictest confidence by Chemical Supplier and shall not be used or disclosed by Chemical Supplier to third persons except

to the extent that such use or disclosure is necessary for the proper performance of this Agreement. If disclosure to third persons is necessary, Chemical Supplier shall ensure that such third persons hold such information in strictest confidence.

10.3 **Patents**

By accepting this Agreement, Chemical Supplier agrees to defend, protect and save harmless Services and each User, and their successors and assigns, from and against any and all liability, damages, loss and expense (including reasonable attorney's fees) by reason of any claim, demand, action or litigation arising out of any alleged or actual, direct or contributory, infringement of any United States or foreign patent arising out of the purchase, sale or use of the Chemicals. Chemical Supplier agrees to notify Services of any potential illegalities connected with the Chemicals. Services and User agree to notify Chemical Supplier promptly of any such claim of which Services or User become aware and to provide Chemical Supplier all reasonable information and assistance (at Chemical Supplier's expense) as may become necessary for defense of the claim. Chemical Supplier shall pay all damages and costs, if any, which may be awarded therein. In case the claim regards the use of the Chemicals, Chemical Supplier shall at its own expense and at its option, either procure for Services and User the right to continue using said Chemicals, or replace same with a non-infringing equivalent, or remove same at Chemical Supplier's sole cost and expense, and refund the purchase price and all transportation, and other charges, duties or fees paid by Services and User in connection with the purchase thereof.

10.4 **Compliance with Laws**

Chemical Supplier shall, in its performance of this Agreement, procure all necessary permits, comply with all applicable federal, state, and local statutes, rules of law, ordinances, regulations, and regulatory orders, including but not limited to the Fair Labor Standards Act of 1938, as amended, Walsh-Healy Act, Robinson-Patman Act, applicable State Workers' Compensation laws, state and federal Occupational Safety and Health Acts, and all rules and regulations passed pursuant thereto, which are incorporated herein by this reference. Chemical Supplier agrees to be subject to all applicable contract clauses required by federal, state or local law, rule or regulation to be included in this Agreement.

10.5 **Assignments**

No assignment by Chemical Supplier of any rights under or interests in the Agreement will be binding on Services or any User without the written consent of Services; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Agreement documents.

10.6 **Successor and Assigns**

Services and Chemical Supplier each binds itself, its partners, successors, assignees and legal representatives to the other party hereto, its partners successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

10.7 **THIS SECTION INTENTIONALLY LEFT BLANK.**

10.8 **Termination**

This Agreement may be terminated by Services fifteen (15) calendar days from the date of written notice for the sole convenience of Services or at any time with written notice if Chemical Supplier fails to comply with the terms of the Contract Documents. If so terminated, Services shall pay Chemical Supplier all undisputed amounts due Chemical Supplier for all Chemicals delivered up to the date of Chemical Supplier's receipt of notice of termination.

10.9 **Rights and Benefits**

Chemical Supplier's obligations hereunder will be performed solely for the benefit of Services and Users and not for the benefit of any other persons or entities.

10.10 **Time of Completion**

Time is of the essence in the performance of Chemical Supplier's obligations described in this Agreement. At the outset of any delay from any cause, Chemical Supplier shall immediately notify Services in writing of the delay or anticipated delay and shall undertake to shorten the delay by all reasonable means. Chemical Supplier shall be solely responsible for the cost of overcoming delays unless such delays are caused by Services or any User.

10.11 **Governing Law; Severability**

10.11.1 This Agreement shall be governed by the Uniform Commercial Code provisions applicable to transactions in goods. This Agreement shall be governed and construed in accordance with the laws of the State of New Jersey, without reference to or application of conflict of laws, rules, or principles.

10.11.2 If any one or more of the provisions contained within this Agreement is deemed invalid, illegal, or otherwise unenforceable by a court of competent jurisdiction, the provision of the Agreement will be enforced to the maximum extent permissible and the remainder of the provisions of this Agreement will remain in full force and effect. Chemical Supplier and Services or User mutually agree to substitute any invalid, illegal or unenforceable provision of this Agreement with a valid, legal, or enforceable provision

which comes as close as possible to the reasonably inferred intent of the invalid, illegal, or unenforceable provision.

10.12 **Survival**

Chemical Supplier's agreements set forth herein shall survive the termination of this Agreement.

10.13 **Entire Agreement**

This Agreement constitutes the entire understanding and agreement between Chemical Supplier and Services relating to the subject matter herein, and except as expressly set forth herein, supersedes any and all prior or contemporaneous agreements or understandings, whether oral or written, relating to the subject matter herein. Any waiver, modification or amendment of any provision of this Agreement will be effective only if in writing and signed by duly authorized representatives of the parties.

10.14 **Waiver**

Services' or Users' failure to insist on performance of any of the terms or conditions herein or to exercise any right or privilege or Services' or Users' waiver of any breach hereunder shall not thereafter waive any other terms, conditions, privileges, whether of the same or similar type.

10.15 **Notices**

All notices required or permitted under this Agreement from one party to another under or in connection with this Agreement shall be in writing (or shall be made by a telecommunications device capable of creating a written record), and shall be delivered to Services and Chemical Supplier at their contact addresses specified below. Notices shall be deemed received at the time they are actually received by the receiving party. Either party may change its address for notices under this Agreement by giving written notice to the other party by the means specified in this Section 10.15.

The respective addresses for giving notices hereunder are as follows:

A. To Chemical Supplier:
Tammy Yergey
Inside Sales Manager
3211 Clinton Parkway Court
Lawrence, KS 66047

B. To Services:
Gerald J. Coyne
Senior Buyer
American Water
1025 Laurel Oak Road
Voorhees, New Jersey 08043

10.16 **Dispute Resolution**

10.16.1 The intent of the parties is to identify and resolve disputes promptly after any dispute arises. Before attempting to exercise any legal or equitable remedy, each party agrees to follow the dispute resolution procedure described below. Except as provided otherwise elsewhere in this Agreement, if either party determines that following the procedure described below in this Section 10.16 could potentially be harmful or damaging to their respective businesses or third-party suppliers, that party may elect to forego the dispute resolution process and pursue injunctive relief.

10.16.2 Escalation of Dispute. If there is a dispute between the parties arising out of this Agreement, each party agrees to engage in good faith negotiations between progressively more senior representatives of each party, as follows.

Level	*Representatives of the Parties*	*Maximum Duration of Negotiations Prior to Escalation to Next Level*
One	**Services**: Chemical Buyer **Chemical Supplier:Inside Sales Manager**	5 business days
Two	**Services**: Director of Supply Chain Department **Chemical Supplier: Sales Manager for Territory**	5 business days
Three	**Services**: COO or American Water's designee **Chemical Supplier: President**	7 business days

Either party may at any time change its representative party designated above by providing written notice to the other party.

If such matter remains unresolved following the negotiations and the expiration of the periods specified above in this Section 10.16.2, each party may immediately

exercise or pursue any other rights or remedies available hereunder or at law or in equity, and it is acknowledged by the parties that nothing herein shall preclude, limit, or otherwise restrict any legal or equitable remedies available to either party for failure of the other party to perform its obligations under this Agreement.

10.17 **Use of Logo**

Chemical Supplier shall not, without Services' express written permission, (i) use Services' name, nor any trade name, logo, trademark, or service mark, whether registered or not, or the name, assumed business name, trade name, logo, trademark, or service mark, whether registered or not, of any User, in connection with publicity, advertisements, promotion or in any other connection, or (ii) identify Services or Users in any manner on customer or vendor lists or on a web site (or on any third party web site) or in any web site metatags; or (iii) disclose to any third party the existence of this Agreement or the monetary value of any Chemicals purchased hereunder. Chemical Supplier shall indemnify Services for reasonable costs and expenses incurred in connection with enforcing the provisions of this Section 10.17. All of the restrictions and obligations set forth in this Section 10.17 shall survive any termination of this Agreement.

10.18 **EEOC**

Chemical Supplier specifically warrants and guarantees to Services:

(a) that it agrees to comply with Executive Order 11246 and abide by the provisions of the "Equal Opportunity Clause" at 41 CFR § 60-1.4, which is incorporated herein by reference, unless exempt pursuant to 41 CFR § 60-1.5;

(b) that it agrees to comply with the Vietnam Era Veterans Readjustment Assistance Act of 1974, as amended, Executive Order 11701 (Employment of Veterans by Federal Agencies and Government Contractors and Subcontractors), and the provisions of the "Affirmative Action for Disabled Veterans and Veterans of the Vietnam Era Clause" at 41 CFR §60-250.5, which is incorporated herein by reference, unless exempt pursuant to 41 CFR §60-250.4.

(c) that it agrees to comply with the Rehabilitation Act of 1973, Executive Order 11758 (Authority Under Rehabilitation Act of 1973), and the provisions of the "Affirmative Action for Workers With Disabilities Clause" at 41 CFR 60-741.5, which is incorporated herein by reference, unless exempt pursuant to 41 CFR §60-741.4;

(d) that it agrees to comply with Executive Order 13201 (Notice of Employee Rights Concerning Payment of Union Dues or Fees) and abide by the provisions of the clause at 29 CFR § 470.2, which is incorporated herein by reference, unless exempt pursuant to 29 CFR §§ 470.3-.4;

(e) that it agrees to comply, where applicable, with the policies set forth in Executive Order 11625 (National Program for Minority Business Enterprises) and Executive Order 12138 (National Program for Women's Business Enterprise), the Small Business Act, 15 U.S.C. § 631, et seq., and with the "Utilization of Small Business Concerns" and "Small Business Subcontracting Plan" clauses at 48 CFR § 52.219-8 and 9, respecting subcontracting with small disadvantaged, female-owned, veteran-owned, service-disabled veteran-owned, HUBZone, and other small businesses.

10.19. Standards of Personnel

10.19.1 Chemical Supplier acknowledges that the Federal Government has declared public- water systems, including Services', to be critical infrastructure essential to the continued operation of the government and the nation.

10.19.2 Chemical Supplier acknowledges that Services' water and wastewater operations are governed by numerous federal and state statutes and regulations, and subject to regulation by numerous federal and state agencies.

10.19.3 Chemical Supplier acknowledges that, among other things, Services provides retail water and wastewater service to the public, as authorized and regulated by public utility commissions, so that Services has a public-service obligation to provide safe and affordable water and wastewater service to the public.

10.19.4 Chemical Supplier will conduct, or will have conducted, a background check on each of its employees or individual subcontractors before the employee or subcontractor performs any function or activity under this Agreement that involves access to Services' confidential information or on-site work at any of Services' or Users' facilities. The background check conducted by Chemical Supplier will include at least the following:

- Previous employers and dates of employment;
- Education;
- Professional License verification;
- Military Service Verification;
- Driving record;
- Criminal history (state and federal);
- References;
- Credit history or social security number trace; and
- Personal history to the extent permitted by applicable laws and regulation.

10.19.5 Chemical Supplier's review of this information will endeavor to:

- authenticate the identity of the individual;
- insure that data is consistent with an individuals stated history and current status;
- uncover any discrepancies;
- reveal any criminal history; and
- uncover any other pertinent information tending to establish that the individual may represent a security risk to Services' personnel, facilities, or Services' responsibility for the public safety and the providing of safe and adequate utility services to its customers.

10.19.6 Before delivering any Chemicals hereunder, Chemical Supplier will provide proof to Services that the requirements of this section have been met. Upon request, Chemical Supplier will make available for Services' review, the documentation and results of the background check

with respect to any employee of Chemical Supplier performing deliveries of Chemicals under this Agreement. Services will not retain such records or documentation and any findings from its review will be confidential.

ARTICLE 11. REPRESENTATIONS AND WARRANTIES

11.1 Chemical Supplier represents and warrants to Services that all Chemicals will be in accordance with Services' specifications and requirements. Chemical Supplier represents and warrants that all Chemicals will conform to any statements made on the containers or labels or advertisements for such Chemicals, and that any Chemicals will be adequately contained, packaged, marked, and labeled. Chemical Supplier represents and warrants that all Chemicals furnished hereunder will be merchantable, and will be safe and appropriate for the purpose for which Chemicals of that kind are normally used. Chemical Supplier knows that such Chemicals will be used in potable water treatment and represents and warrants that such Chemicals will be fit for such purpose. Chemical Supplier represents and warrants that Chemicals furnished will conform in all respects to any samples provided to Services or Users. Inspection, test, acceptance or use of Chemicals furnished hereunder shall not affect Chemical Supplier's obligation under this warranty, and such representations and warranties shall survive inspection, test acceptance and use. All of Chemical Supplier's representations and warranties shall run to Services, the Users and their respective successors, assigns and customers. Chemical Supplier will replace or correct defects of any Chemicals not conforming to the foregoing warranties promptly, without expense to Services (including, but not limited to, any expenses relating the removal, transportation and disposal of such non-conforming and/or defective Chemicals), when notified of such nonconformity by Services or any User, provided Services or such User elects to provide Chemical Supplier with the opportunity to do so. In the event of failure of Chemical Supplier to correct defects in or replace nonconforming Chemicals promptly, Services, after reasonable notice to Chemical Supplier, may make such corrections or replace such Chemicals and charge Chemical Supplier for the cost incurred by Services in doing so.

11.2 Chemical Supplier represents and warrants that the cylinders and containers delivered to Services are free from defects, routinely inspected and maintained. Leaking containers will be rejected by the Services, and any cost of removal, transport, and disposal of such containers shall be borne solely by Chemical Supplier.

11.3 Chemical Supplier represents and warrants that: (i) it is capable in all respects of providing all Chemicals in accordance with this Agreement; and (ii) it understands the nature and scope of Chemicals to be provided hereunder.

11.4 Chemical Supplier represents and warrants that, as of the Effective Date, there is no pending or threatened outstanding litigation, arbitrated matter, or other dispute to which Chemical Supplier is a party, that, if decided unfavorably to Chemical Supplier, could reasonably be expected to have a potential or actual material adverse effect on Chemical Supplier's ability to fulfill its obligations hereunder, and that Chemical Supplier knows of no basis that might give rise to any such litigation, arbitration, or other dispute in the

foreseeable future. Upon becoming aware of any such basis, Chemical Supplier shall promptly notify Services thereof.

11.5 Chemical Supplier warrants that, in providing the Chemicals and in otherwise performing its obligations under this Agreement, Chemical Supplier shall comply, and, to the extent within Chemical Supplier's control, shall not prevent Services or its affiliates from complying or materially impede them in complying, with all applicable laws, regulations, and ordinances of any relevant jurisdiction, and all applicable policies of Services and its affiliates, including but not limited to those pertaining to personnel and security.

IN WITNESS WHEREOF, Services and Chemical Supplier have signed this Agreement in duplicate as of the date last signed below (the "Effective Date"). One counterpart each has been delivered to Services and Chemical Supplier.

American Water Works Service Company, Inc.

By: _____

Date: 2.17.08

Attest: _____

Kemira Water Solutions, Inc.:

By: _____ Tammy Yergey

Date: 2/12/08

Attest: _____

EXHIBIT A – PRICING

EXHIBIT B – POLYMER CERTIFICATION

American Water Works Service Company, Inc.
TO BE SUBMITTED FOR POLYMER BIDS ONLY
Acrylamide/Epichlorohydrin Certification Sheet
For the Calendar Year 2008

Product: _____

Manufacturer: _____

Supplier: _____

Please check the appropriate boxes in each applicable category of both the acrylamide and epichlorohydrin certification below, and supply the composition information where applicable.

ARTICLE 12.ACRYLAMIDE CERTIFICATION

- ☐ I certify that the above named product does not contain acrylamide, OR
- ☐ I certify that the acrylamide level in the above named product does not exceed 0.05% when added to water at a level of 1 mg/l.

OR

- ☐ I certify that the above named product contains _____% acrylamide, and that the product should not be used at a dosage rate above _____mg/l.

EPICHLOROHYDRIN CERTIFICATION

- ☐ I certify that the above named product does not contain epichlorohydrin. OR
- ☐ I certify that the epichlorohydrin level in the above named product does not exceed 0.01% when added to water at a level of 20 mg/l.

OR

- ☐ I certify that the above named product contains _____% epichlorohydrin and that the product should not be used at a dosage rate above ____mg/l.

The above information is, to the best of my knowledge, true and correct.

_____	_____
Name	**Company**
_____	_____
Signature	**Date**

EXHIBIT C – HAZARDOUS CHEMICALS

The following hazardous materials are stored on site and/or used in the water treatment process by Services:

1. Aluminum Sulfate
2. Chlorine
3. Hydrofluosilicic Acid
4. Gasoline
5. Propane
6. Sodium Metabisulfite
7. Powdered Activated Carbon
8. Orthophosphoric Acid
9. Potassium Permanganate
10. Ferric Chloride
11. Ferric Sulfate
12. Sodium Hydroxide
13. Ammonia
14. Ammonium Sulfate
15. Diesel Fuel
16. Polyaluminum Chloride
17. Soda Ash
18. Sodium Hypochlorite
19. Sodium Polyphosphates

SCHEDULE 1 – PRODUCT SPECIFICATION SHEETS

kemira

MATERIAL SAFETY DATA SHEET
Ferric Sulfate

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

	USA	CANADA
Supplier:	Kemira Water Solutions, Inc. 316 Bartow Municipal Airport Bartow, Florida 33830	Kemira Water Solutions Canada Inc. 3405 Blvd. Marie Victorin Varennes, Québec J3X 1T6
Customer Service Telephones:	(800) 879-6353 (785) 842-7424	(800) 465-6171 (450) 652-0665

(800) 450-7352 - Polymers

Emergency Contacts (24 hr.)

FOR EMERGENCIES INVOLVING CHEMICAL SPILL OR RELEASE, CALL

CHEMTREC	**(800) 424-9300**	**USA (TOLL FREE)**
CANUTEC	**(613) 996-6666**	**CANADA (CALL COLLECT)**

Product Name:	Ferric Sulfate
Chemical Family:	Inorganic Salts
Formula:	$Fe_2(SO_4)_3 \cdot 9H_2O$
Synonym:	Iron (III) Sulfate
Acceptable Product Uses:	Water and wastewater treatment and odor removal,

2. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS Number #	Concentration
Ferric Sulfate	010028-22-5	50-66% as $Fe_2(SO_4)_3 \cdot 9H2O$
Sulfuric Acid	7664-93-9	<0.1%

WHMIS Classification: Class E

3. HAZARDS IDENTIFICATION

Emergency Overview: Irritating to skin, eyes, and mucous membranes.

Potential Effects on Health: Acute and chronic.

Carcinogenicity: Does not contain any known carcinogens or potential carcinogens.

4. FIRST AID MEASURES

General: If you feel unwell, seek medical attention (show the label or this MSDS if possible). Effects of exposure (inhalation, ingestion, or skin contact)

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MATERIAL SAFETY DATA SHEET
Ferric Sulfate

to substance may be delayed. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

Skin Contact: Remove all contaminated clothing, jewelry, and shoes. Wash affected area with soap or mild detergent and running water for at least 15 minutes. If irritation persists, seek medical attention.

Eye Contact: Flush immediately with water for at least 15 minutes, occasionally lifting upper and lower lids. Obtain medical attention immediately.

Inhalation: Move to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim has ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Obtain medical attention immediately.

Ingestion: *If conscious*, give two (2) glasses of water. **DO NOT INDUCE VOMITING.** Do not give anything by mouth to an unconscious person. Obtain immediate medical attention.

5. FIRE FIGHTING MEASURES

Flash point	Not applicable. Will not burn
Flammable Limits (Lower)	Not applicable
Flammable Limits (Upper)	Not applicable
Auto Ignition Temperature	Not applicable
Combustion and Thermal Decomposition Products	Oxides of sulfur.
Rate of Burning	Does not burn
Explosive Power	Not applicable
Sensitivity to Static Discharge	Not available

Fire and Explosion Hazards: During a fire, oxides of sulfur may be evolved.

Extinguishing Media: The substance is not combustible. Use extinguishing media appropriate to the surrounding fire.
NOTE: Also see "Section 10 – Stability and Reactivity"

6. ACCIDENTAL RELEASE MEASURES

Spills, Leaks, or Release:

- → **Restrict access** until clean-up operations are complete. Wear appropriate Personal Protective Equipment per Section 8. Ensure trained personnel conduct clean up and wear Personal Protective Equipment per Section 8.
- → **Stop leak if possible.** Avoid personal risk.
- → **Notify Authorities** if release exceeds reportable quantity per Section 15

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MATERIAL SAFETY DATA SHEET
Ferric Sulfate

→ **Small Spills** – Absorb spill with clay or dry material or neutralize with lime, limestone or soda ash and collect in appropriate container for disposal. Neutralization with soda ash can generate carbon dioxide so additional ventilation may be necessary.

→ **Large Spills** – Prevent entry into sewers and confined areas. Dike, if possible. Keep unnecessary people away, isolate area and deny entry. Pump liquid material into appropriate vessels as possible or absorb spill with clay absorbents or non-reactive dry materials and collect in appropriate container for disposal.

Neutralize spill residuals carefully with lime, limestone, or soda ash and collect in suitable container for disposal. Flush area with water. This could generate carbon dioxide so additional ventilation may be necessary. Notify the appropriate environmental authorities.

7. HANDLING AND STORAGE

Handling: Handle all chemicals with respect. Review the label, this MSDS and any other applicable information before use. Keep separated from incompatible substances. Use appropriate Personal Protective Equipment per Section 8. Handle only with equipment, materials and supplies specified by their manufacturer as being compatible and appropriate for use with this product.

Storage Requirements:
Ensure that al storage vessels are labeled. Avoid skin and eye contact. Wear appropriate protective clothing. Store only in dry rubber-lined, plastic, FRP or stainless steel (304, 316). Keep storage temperatures between 10° and 30° C. Store away from incompatible materials such as alkalis. Keep smaller containers as drums and totes tightly closed when not in use or when empty. Product should be used within one year. Storage facilities should have secondary containment as required by law or regulation. **Storage tanks, piping and offloading points should be labeled with appropriate signage to avoid accidents.** 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

Preventive Measures:

Engineering Controls: A ventilation system of local/general exhaust is recommended to keep employee exposure below the Airborne Exposure Limits. Ensure that eyewash station and safety showers are proximal to the workstation location.

Personal Protection Equipment:

Eye Protection: Wear splash resistant chemical goggles and, where splashing is possible, a full face shield. Maintain eye wash fountain and quick-drench facilities in work area.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to avoid skin contact.

Recommended Protective Material: Neoprene

Respiratory Protection: Under conditions of misting or contact with head gases, respiratory protection may be needed. Consider respirator warning properties before use.

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MATERIAL SAFETY DATA SHEET
Ferric Sulfate

- With limited contact use an appropriate chemical cartridge respirator with acid gas cartridge(s)

- When cleaning, decontaminating or performing maintenance on tanks, containers, piping systems and accessories, and in any other situations where airborne contaminants and/or dust could be generated, use protective equipment to protect against ingestion or inhalation. HEPA or air supplied respirator, full protective coveralls with head cover, gloves and boots or chemical suits, and boots are suggested.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Red brown
Odor:	Acidic
Form:	Liquid
pH as is:	<2
Vapor Pressure (mm Hg):	N/A
Boiling Point:	105 °C - 110 °C (220 °F - 230 °F)
Specific Gravity (20°C):	1.38-1.59
Solubility (water):	soluble
Vapor Density (Air=1):	N/A
Percent Volatile by Vol.:	N/A
Freezing Point:	Consult your Kemira Water Solutions representative

10. STABILITY AND REACTIVITY

Hazardous Decomposition Products: Thermal decomposition will yield oxides of sulfur.
Chemical Stability: Stable at normal temperatures and pressure.
Conditions to Avoid: Avoid contact with mineral acids, excessive heat and bases/alkalis
Incompatibility with other Substances: carbon steel, brasses, and nylon.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Not available.

12. ECOLOGICAL INFORMATION

Not available.

13. DISPOSAL CONSIDERATIONS

Review Federal, State, Provincial, and Local government regulations prior to disposal. This material exhibits the characteristic of corrosivity to metals and other building materials and any disposal must comply with hazardous waste disposal requirements. Any residues and/or rinse waters from cleaning of tanks, containers, piping systems and accessories may

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MATERIAL SAFETY DATA SHEET
Ferric Sulfate

be a hazardous characteristic waste and must be properly disposed of in accordance with federal, state, provincial and local laws.
RCRA: Test waste material for corrosivity, D002, prior to disposal

14. TRANSPORT INFORMATION

	Canada (TDG)	U.S. (DOT)
Shipping Name	Corrosive Liquids, Acidic, Inorganic NOS. (Ferric Sulfate/FerriClear)	Corrosive Liquids, Acidic, Inorganic NOS. (Ferric Sulfate/FerriClear)
Hazard Class/Division	8: Corrosive liquid	8: Corrosive liquid
Identification No. **Packing Group:**	UN 3264 III	UN 3264 III

Transportation Emergency Telephone Numbers:
1-800-424-9300 CHEMTREC (USA)
1-613-996-6666 CANUTEC (CANADA) (CALL COLLECT)

IATA/ICAO Class: 8

15. REGULATORY INFORMATION

USA CLASSIFICATION:

OSHA Classification: Hazardous by definition of Hazard Communication Standard (29 CFR 1920.1200)

CERCLA: Hazardous substance/reportable quantity (RQ): final RQ = 1000 lb. (454 kg) Based on anhydrous Ferrous Sulfate (divide by solution concentration to obtain solution weight)

SARA Regulations sections 313 and 40 CFR 372: No

SARA Hazard Categories, SARA SECTIONS 311/312 (40CRF370.21):

Acute	Yes
Chronic	No
Fire	No
Reactive	No
Sudden Release	No
OSHA Process Safety (29CFR1910.119)	No

Clean Water Act Requirements: Designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance.
TSCA: This substance or all ingredients of this product are listed on the Chemical Substances Inventory of the TSCA. Does not require reporting.

Other Regulations/Legislation which apply to this product:
California Proposition 65: No

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MATERIAL SAFETY DATA SHEET
Ferric Sulfate

Right-To-Know Lists: Massachusetts, New Jersey, Pennsylvania, California
This product does not contain, nor is it manufactured with, ozone-depleting substances.

CANADIAN CLASSIFICATION

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

Controlled Products Regulation (WHMIS) Classification: E: Corrosive

CEPA / Canadian Domestic Substances List (DSL): The substances in this product are on the Canadian Domestic Substances List (CEPA DSL).

EEC CLASSIFICATION

EINECS: 233-072-9

16. OTHER INFORMATION

National Fire Protection Association (NFPA) and Hazardous Materials Identification System (HMIS) Ratings:

	NFPA	HMIS
HEALTH	2	2
FIRE	0	0
REACTIVITY	0	0
CORROSIVE	YES	YES

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

Kemira Water Solutions, Inc., and Kemira Water Solutions of Canada, Inc. provide the foregoing information in good faith and make no representations as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using the product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.

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MSDS Revised on October 1, 2006 by Kemira Water Solutions HSE group

For more information on the use or the performance of our products, or for sample requests please contact your Kemira Water Solutions Representative or Customer Service at the numbers in Section 1 of this MSDS

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MATERIAL SAFETY DATA SHEET
Alum

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

	USA	CANADA
Supplier:	Kemira Water Solutions, Inc. 316 Bartow Municipal Airport Bartow, Florida 33830	Kemira Water Solutions Canada Inc. 3405 Blvd. Marie Victorin Varennes, Québec J3X 1T6
Customer Service Telephones:		
	(800) 879-6353	(800) 465-6171
	(785) 842-7424	(450) 652-0665

(800) 450-7352 - Polymers

Emergency Contacts (24 hr.)

FOR EMERGENCIES INVOLVING CHEMICAL SPILL OR RELEASE, CALL

CHEMTREC	**(800) 424-9300**	**USA (TOLL FREE)**
CANUTEC	**(613) 996-6666**	**CANADA (CALL COLLECT)**

Product Name: Aluminum Sulfate
Chemical Family: Inorganic Salts
Formula: $Al_2(SO4)_3$
Synonym: Aluminum Sulfate
Acceptable Product Uses: Paper production, Water and wastewater treatment

2. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS Number #	Concentration
Aluminum sulfate	10043-01-3	48-50% (as $Al_2(SO4)_3 * 14\ H_2O$)

WHMIS Classification: Class E

3. HAZARDS IDENTIFICATION

Emergency Overview: Irritating to skin, eyes, and mucous membranes.

Potential Effects on Health: Acute and chronic.

Carcinogenicity: Does not contain any known carcinogens or potential carcinogens.

4. FIRST AID MEASURES

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MATERIAL SAFETY DATA SHEET
Alum

General: If you feel unwell, seek medical attention (show the label or this MSDS if possible). Ensure that medical personnel are aware of the material(s) involved.

Skin Contact: Remove all contaminated clothing, jewelry, and shoes. Wash affected area with soap or mild detergent and running water for at least 15 minutes. Remove contaminated clothing and wash before reuse. If irritation develops, seek medical attention.

Eye Contact: Flush immediately with water for at least 15 minutes, occasionally lifting upper and lower lids. Obtain medical attention.

Inhalation: Move to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim has ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Obtain medical attention if cough or other symptoms develop,

Ingestion: DO NOT INDUCE VOMITING. If conscious, give two (2) glasses of water. Do not give anything by mouth to an unconscious person. Get medical attention.

5. FIRE FIGHTING MEASURES

Flash point	Not applicable. Will not burn
Flammable Limits (Lower)	Not applicable
Flammable Limits (Upper)	Not applicable
Auto Ignition Temperature	Not applicable
Combustion and Thermal Decomposition Products	Oxides of sulfur. Aluminum oxides. .
Rate of Burning	Does not burn
Explosive Power	Not applicable
Sensitivity to Static Discharge	Not available

Fire and Explosion Hazards: During a fire, irritating/toxic and corrosive fumes may evolve.
Extinguishing Media: The substance is not combustible. Use extinguishing media appropriate to the surrounding fire.

6. ACCIDENTAL RELEASE MEASURES

Spills, Leaks, or Release:

→ **Restrict access** until clean-up operations are complete. Wear appropriate Personal Protective Equipment per Section 8. Ensure trained personnel conduct clean up and wear Personal Protective Equipment per Section 8.

→ **Stop leak if possible**. Avoid personal risk.

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MATERIAL SAFETY DATA SHEET
Alum

→ **Notify Authorities** if release exceeds reportable quantity per Section 15
→ **Small Spills** – Absorb spill with clay or dry material or neutralize with lime, limestone or soda ash and collect in appropriate container for disposal. Neutralization with soda ash can generate carbon dioxide so additional ventilation may be necessary.
→ **Large Spills** – Prevent entry into sewers and confined areas. Dike, if possible. Keep unnecessary people away, isolate area and deny entry. Pump liquid material into appropriate vessels as possible or absorb spill with clay absorbents or non-reactive dry materials and collect in appropriate container for disposal.
→ **Neutralize spill residuals** carefully with lime, limestone, or soda ash and collect in a suitable container for disposal. Flush area with water. This could generate carbon dioxide so additional ventilation may be necessary. Notify the appropriate environmental authorities.

7. HANDLING AND STORAGE

Handling: Handle all chemicals with respect. Review the label, this MSDS and any other applicable information before use. Keep separated from incompatible substances. Use appropriate Personal Protective Equipment per Section 8. Handle only with equipment, materials and supplies specified by their manufacturer as being compatible and appropriate for use with this product.

Storage Requirements:
Bulk storage containers and ancillary fill and feed systems should be constructed out of appropriate materials. Store in 316 stainless steel or rubber lined steel. For temperatures below 40° C (104° F), fiberglass or 304 stainless steel are also acceptable materials of construction.

Material may be stored in tightly closed shipping containers, preferably the supplier's containers. 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

Preventive Measures:

Engineering Controls: A ventilation system of local/general exhaust is recommended to keep employee exposure below the Airborne Exposure Limits. Ensure that eyewash station and safety showers are proximal to the workstation location.

Personal Protection Equipment:

Eye Protection: Wear splash resistant chemical goggles and, where splashing is possible, a full face shield. Maintain eye wash fountain and quick-drench facilities in work area.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to avoid skin contact.

Recommended Protective Material: Neoprene, Never use leather.

Respiratory Protection: Under conditions of misting or contact with head gases, respiratory protection may be needed. Consider respirator warning properties before use.

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MATERIAL SAFETY DATA SHEET
Alum

- With limited contact use an appropriate chemical cartridge respirator with acid gas cartridge(s)

- When cleaning, decontaminating or performing maintenance on tanks, containers, piping systems and accessories, and in any other situations where airborne contaminants and/or dust could be generated, use protective equipment to protect against ingestion or inhalation. HEPA or air supplied respirator, full protective coveralls with head cover, gloves and boots or chemical suits, and boots are suggested.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear
Odor:	Slight acidic
Form:	Liquid
pH as is:	< 2.5
Vapor Pressure (mm Hg):	40 mm Hg @ 35° C
Boiling Point:	106° C (220° F)
Specific Gravity (20°C):	1.2-1.35
Solubility (water):	soluble
Vapor Density (Air=1):	N/A
Percent Volatile by Vol.:	N/A
Freezing Point:	Concentration dependent (Consult your Kemira representative)

10. STABILITY AND REACTIVITY

Hazardous Decomposition Products: Thermal decomposition: after completely dry and heated to decomposition will produce sulfur oxides and aluminum oxides.
Chemical Stability: Stable at normal temperatures and pressure.
Conditions to Avoid: Avoid contact with mineral acids, excessive heat and bases/alkalis
Incompatibility with other Substances: Carbon steel, aluminum, carbon, brasses, and nylon.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Not available.

12. ECOLOGICAL INFORMATION

Not available.

13. DISPOSAL CONSIDERATIONS

Review Federal, State, Provincial, and Local government regulations prior to disposal. This material exhibits the characteristic of corrosivity to metals and other building materials and any disposal must comply with hazardous waste disposal requirements. Any residues

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MATERIAL SAFETY DATA SHEET
Alum

and/or rinse waters from cleaning of tanks, containers, piping systems and accessories may be a hazardous characteristic waste and must be properly disposed of in accordance with federal, state, provincial and local laws.
RCRA: Test waste material for corrosivity, D002, prior to disposal

14. TRANSPORT INFORMATION

	Canada (TDG)	U.S. (DOT)
Shipping Name	Corrosive liquid.	Corrosive liquid,
Hazard Class/Division	8: Corrosive Liquid, Acidic, Inorganic, N.O.S.	8: Corrosive Liquid, Acidic, Inorganic, N.O.S.
Identification No. Packing Group:	UN 3264 III	UN 3264 III

Transportation Emergency Telephone Numbers:
1-800-424-9300 CHEMTREC (USA)
1-613-996-6666 CANUTEC (CANADA) (CALL COLLECT)

IATA/ICAO Class: 8

15. REGULATORY INFORMATION

USA CLASSIFICATION:

OSHA Classification: Hazardous by definition of Hazard Communication Standard (29 CFR 1920.1200)

CERCLA: Hazardous substance/reportable quantity (RQ): final RQ = 5,000 lb. (2273 kg) Based on anhydrous aluminum sulfate (divide by solution concentration to obtain solution weight)

SARA Regulations sections 313 and 40 CFR 372: No

SARA Hazard Categories, SARA SECTIONS 311/312 (40CRF370.21):

Acute	Yes
Chronic	No
Fire	No
Reactive	No
Sudden Release	No
OSHA Process Safety (29CFR1910.119)	No

Clean Water Act Requirements: Designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance.
TSCA: This substance or all ingredients of this product are listed on the Chemical Substances Inventory of the TSCA. Does not require reporting.

Other Regulations/Legislation which apply to this product:
California Proposition 65: No

Right-To-Know Lists: Massachusetts, New Jersey, Pennsylvania, California

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MATERIAL SAFETY DATA SHEET
Alum

This product does not contain, nor is it manufactured with, ozone-depleting substances.

CANADIAN CLASSIFICATION

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

Controlled Products Regulation (WHMIS) Classification: E: Corrosive

CEPA / Canadian Domestic Substances List (DSL): The substance in this product is on the Canadian Domestic Substances List (CEPA DSL).

16. OTHER INFORMATION

National Fire Protection Association (NFPA) and Hazardous Materials Identification System (HMIS) Ratings:

	NFPA	HMIS
HEALTH	1	1
FIRE	0	0
REACTIVITY	0	0

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

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MSDS Revised on February 16, 2007 by Kemira Water Solutions HSE group

For more information on the use or the performance of our products, or for sample requests please contact your Kemira Water Solutions Representative or Customer Service at the numbers in Section 1 of this MSDS

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MATERIAL SAFETY DATA SHEET
Ferric Chloride

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

	USA	CANADA
Supplier:	Kemira Water Solutions, Inc. 316 Bartow Municipal Airport Bartow, Florida 33830	Kemira Water Solutions Canada Inc. 3405 Blvd. Marie Victorin Varennes, Québec J3X 1T6
Customer Service Telephones:	(800) 879-6353 (785) 842-7424	(800) 465-6171 (450) 652-0665

(800) 450-7352 - Polymers

Emergency Contacts (24 hr.)

FOR EMERGENCIES INVOLVING CHEMICAL SPILL OR RELEASE, CALL

CHEMTREC	**(800) 424-9300**	**USA (TOLL FREE)**
CANUTEC	**(613) 996-6666**	**CANADA (CALL COLLECT)**

Product Name:	Ferric Chloride
Chemical Family:	Inorganic Salts
Formula:	$FeCl_3$
Synonym:	Iron (III) Chloride
Acceptable Product Uses:	Water and wastewater treatment, odor removal, adhesive for dye, textile impression pigment, ink and photoengraving.

2. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS Number #	Concentration	ACGIH TWA
Ferric Chloride	7705-08-0	28 – 43 %	1 mg/m3 (as Fe)
Hydrochloric Acid	7647-01-0	<5 %	5 ppm

3. HAZARDS IDENTIFICATION

Emergency Overview: Eye contact may cause irritation. Harmful if inhaled. Harmful or fatal if swallowed.

Potential Effects on Health: Acute and chronic.

Carcinogenicity: Does not contain any known carcinogens or potential carcinogens.

4. FIRST AID MEASURES

General: If you feel unwell, seek medical attention (show the label or this MSDS if possible). Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed. Ensure that medical personnel are

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MATERIAL SAFETY DATA SHEET
Ferric Chloride

aware of the material(s) involved, and take precautions to protect themselves.

Skin Contact: Remove all contaminated clothing, jewellery, and shoes. Wash affected area with soap or mild detergent and running water for at least 15 minutes. If irritation is still present, seek medical attention.

Eye Contact: Flush immediately with water for at least 15 minutes, occasionally lifting upper and lower lids, until no evidence of chemical remains. Obtain medical attention immediately.

Inhalation: Move to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim has ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Obtain medical attention immediately.

Ingestion: *If conscious*, give two (2) glasses of water. **DO NOT INDUCE VOMITING**. Do not give anything by mouth to an unconscious person. Obtain immediate medical attention.

5. FIRE FIGHTING MEASURES

Flash point	Not applicable. Will not burn
Flammable Limits (Lower)	Not applicable
Flammable Limits (Upper)	Not applicable
Auto Ignition Temperature	Not applicable
Combustion and Thermal Decomposition Products	hydrogen chloride gas, phosgene gas if dried and then heated
Rate of Burning	Does not burn
Explosive Power	Not applicable
Sensitivity to Static Discharge	Not available

Fire and Explosion Hazards: During a fire, irritating/toxic hydrogen chloride, and/or phosgene gases may be generated if material is dried and then heated to decomposition.
Extinguishing Media: The substance is not combustible. Use extinguishing media appropriate to the surrounding fire.
NOTE: Also see "Section 10 – Stability and Reactivity"

6. ACCIDENTAL RELEASE MEASURES

Spills, Leaks, or Release:

- → **Restrict access** until clean-up operations are complete. Wear appropriate Personal Protective Equipment per Section 8. Ensure trained personnel conduct clean up and wear Personal Protective Equipment per Section 8.
- → **Stop leak if possible**. Avoid personal risk.
- → **Notify Authorities** if release exceeds reportable quantity per Section 15

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MATERIAL SAFETY DATA SHEET
Ferric Chloride

→ **Small Spills** – Absorb spill with clay or dry material or neutralize with lime, limestone or soda ash and collect in appropriate container for disposal. Neutralization with soda ash can generate carbon dioxide so additional ventilation may be necessary.

→ **Large Spills** – Prevent entry into sewers and confined areas. Dike, if possible. Keep unnecessary people away, isolate area and deny entry. Pump liquid material into appropriate vessels as possible or absorb spill with clay absorbents or non-reactive dry materials and collect in appropriate container for disposal.

Neutralize spill residuals carefully with lime, limestone, or soda ash and collect in suitable container for disposal. Flush area with water. This could generate carbon dioxide so additional ventilation may be necessary. Notify the appropriate environmental authorities.

7. HANDLING AND STORAGE

Handling: Handle all chemicals with respect. Review the label, this MSDS and any other applicable information before use. Keep separated from incompatible substances. Use appropriate Personal Protective Equipment per Section 8. Handle only with equipment, materials and supplies specified by their manufacturer as being compatible and appropriate for use with this product.

Storage Requirements:

Bulk storage containers and ancillary fill and feed systems should be constructed out of appropriate materials such as polyethylene, polypropylene, rubber-lined steel and FRP designated as appropriate for use with this product. Storage tanks should be vented to scrubber or exterior atmosphere. Storage facilities should have secondary containment as required by law or regulation. **Storage tanks, piping and offloading points should be labeled with appropriate signage to avoid accidents.**

Some concentrations of this product will freeze or crystallize at low temperatures. Insulate and heat-trace storage tanks, pumps, pipes and ancillary equipment as necessary.

Product should be used within one (1) year.

Material may be stored in tightly closed shipping containers, preferably the supplier containers. 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

Preventive Measures:

Engineering Controls: A ventilation system of local/general exhaust is recommended to keep employee exposure below the Airborne Exposure Limits. Ensure that eyewash station and safety showers are proximal to the workstation location.

Personal Protection Equipment:

Eye Protection: Wear splash resistant chemical goggles and, where splashing is possible, a full face shield. Maintain eye wash fountain and quick-drench facilities in work area.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to avoid skin contact.

Recommended Protective Material: Neoprene

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MATERIAL SAFETY DATA SHEET
Ferric Chloride

Respiratory Protection: Under conditions of misting or contact with head gases, respiratory protection may be needed. Consider respirator warning properties before use.

- With limited contact use an appropriate chemical cartridge respirator with acid gas cartridge(s)

- When cleaning, decontaminating or performing maintenance on tanks, containers, piping systems and accessories, and in any other situations where airborne contaminants and/or dust could be generated, use protective equipment to protect against ingestion or inhalation. An acid gas respirator, self-contained breathing apparatus or air supplied respirator, full protective coveralls with head cover, gloves and boots or chemical suits, and boots are suggested.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Reddish Brown
Odor:	Slight pungent odor
Form:	Liquid
pH as is:	<2
Vapor Pressure (mm Hg):	Negligible
Boiling Point:	105 °C - 110 °C (220 - 230 °F)
Specific Gravity (20°C):	1.26 – 1.48
Solubility (water):	max 0.78 kg $FeCl_3$ (anhydrous) / kg water
Vapor Density (Air=1):	N/A
Percent Volatile by Vol.:	N/A
Freezing Point:	Concentration dependent (Consult your Kemira representative)

10. STABILITY AND REACTIVITY

Hazardous Decomposition Products: Thermal decomposition of dried residues - will produce hydrogen chloride gas.
Chemical Stability: Stable at normal temperatures and pressure.
Conditions to Avoid: Dangerous gases may accumulate in confined spaces.
Incompatibility with other Substances: Reacts with most metals (except Titanium and Tantalum) and bases (alkaline materials). Material has moderate oxidizing capability, avoid contact with strong reducing agents.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Based on Ferric Chloride Solid (anhydrous)
TOXICOLOGICAL DATA: LD_{50} (oral, rat) = 450 mg/kg

Mutagenicity: Other mutation test systems: Escherichia coli – 500 nmol/tube;
Phage inhibition capacity: Escherichia coli 41 ng/well

Reproductive Effects: TDLo Rat 1 day(s) intratesticular 12976 µg/kg;
TDLo Rat 1 day(s) intravaginal 29 mg/kg pre pregnancy continuous

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MATERIAL SAFETY DATA SHEET
Ferric Chloride

Teratogenicity and Fetotoxicity: Not available

Synergistic Materials: Not available

12. ECOLOGICAL INFORMATION

Based on Ferric Chloride Solution

Ecotoxicological Information: TLm Daphnia 15 ppm/96 hr fresh water / Conditions of bioassay not specified

Persistence and Degradation: No data available

13. DISPOSAL CONSIDERATIONS

Review Federal, State, Provincial, and Local government regulations prior to disposal. This material exhibits the characteristic of corrosivity to metals and other building materials and any disposal must comply with hazardous waste disposal requirements. Any residues and/or rinse waters from cleaning of tanks, containers, piping systems and accessories may be a hazardous characteristic waste and must be properly disposed of in accordance with federal, state, provincial and local laws.

RCRA: Test waste material for corrosivity, D002, prior to disposal

14. TRANSPORT INFORMATION

	Canada (TDG)	U.S. (DOT)
Shipping Name	Ferric Chloride Solution	Ferric Chloride Solution
Hazard Class/Division	8: Corrosive liquid	8: Corrosive liquid
Identification No.	UN2582	UN2582
Packing Group:	III	III

IATA/ICAO Class: 8

15. REGULATORY INFORMATION

USA CLASSIFICATION:

OSHA Classification: Hazardous by definition of Hazard Communication Standard (29 CFR 1920.1200)

CERCLA: Hazardous substance/reportable quantity (RQ): final RQ = 1000 lb. (454 kg) Based on Anhydrous Ferric Chloride (divide by solution concentration to obtain solution weight)

SARA Regulations sections 313 and 40 CFR 372: No

SARA Hazard Categories, SARA SECTIONS 311/312 (40CRF370.21):

Acute	Yes
Chronic	No
Fire	No
Reactive	No
Sudden Release	No

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MATERIAL SAFETY DATA SHEET
Ferric Chloride

OSHA Process Safety (29CFR1910.119)	Yes

Clean Water Act Requirements: Designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance.

TSCA: This substance or all ingredients of this product are listed on the Chemical Substances Inventory of the TSCA. Does not require reporting.

Other Regulations/Legislation which apply to this product:
California Proposition 65: No

Right-To-Know Lists: Massachusetts, New Jersey, Pennsylvania, California
This product does not contain, nor is it manufactured with, ozone-depleting substances.

CANADIAN CLASSIFICATION

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

Controlled Products Regulation (WHMIS) Classification: E: Corrosive

CEPA / Canadian Domestic Substances List (DSL): The substance in this product is on the Canadian Domestic Substances List (CEPA DSL).

EEC CLASSIFICATION

EINECS: 231-729-4

16. OTHER INFORMATION

National Fire Protection Association (NFPA) and Hazardous Materials Identification System (HMIS) Ratings:

	NFPA	HMIS
HEALTH	2	2
FIRE	0	0
REACTIVITY	1	1

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

Kemira Water Solutions, Inc., and Kemira Water Solutions Canada, Inc. provide the foregoing information in good faith and make no representations as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using the product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.

Kemira Water Solutions, Inc., and Kemira Water Solutions Canada, Inc. make no representations or warranties, either expressed or implied, including without limitation any warranties of merchantability or fitness for a particular purpose with respect to the information set forth herein or the product to which the information refers. Accordingly, Kemira Water Solutions, Inc., and Kemira Water Solutions Canada, Inc. disclaim responsibility for damages resulting from use or reliance upon this information.

MSDS Revised on February 16, 2007 by Kemira Water Solutions HSE group

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MATERIAL SAFETY DATA SHEET
Ferrous Chloride

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

	USA	CANADA
Supplier:	Kemira Water Solutions, Inc. 316 Bartow Municipal Airport Bartow, Florida 33830	Kemira Water Solutions Canada Inc. 3405 Blvd. Marie Victorin Varennes, Quebec J3X 1T6
Telephone:	(800) 879-6353 - Sales (785) 842-7424	(800) 465-6171 (450) 652-0665

(800-450-7352 – Polymers)

Emergency Contacts (24 hr.)

FOR EMERGENCIES INVOLVING CHEMICAL SPILL OR RELEASE, CALL

CHEMTREC	**(800) 424-9300**	**USA (TOLL FREE)**
CANUTEC	**(613) 996-6666**	**CANADA (CALL COLLECT)**

Product Name:	Ferrous Chloride
Chemical Family:	Inorganic Salts
Formula:	$FeCl_2$
Synonym:	Iron (II) Chloride
Acceptable Product Uses:	Water and wastewater treatment, odor removal, adhesive for dye, textile impression pigment, ink and photoengraving.

2. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS Number #	Concentration
Ferrous Chloride	7758-94-3	18-36%
Hydrochloric Acid	7647-01-0	<5 %

WHMIS Classification: Class E

3. HAZARDS IDENTIFICATION

Emergency Overview: Irritating to skin, eyes, and mucous membranes.

Potential Effects on Health: Acute and chronic.

Carcinogenicity: Does not contain any known carcinogens or potential carcinogens.

4. FIRST AID MEASURES

General: If you feel unwell, seek medical attention (show the label or this MSDS if possible). Effects of exposure (inhalation, ingestion, or skin contact)

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MATERIAL SAFETY DATA SHEET
Ferrous Chloride

to substance may be delayed. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

Skin Contact: Remove all contaminated clothing, jewelry, and shoes. Wash affected area with soap or mild detergent and running water for at least 15 minutes. If irritation persists, seek medical attention.

Eye Contact: Flush immediately with water for at least 15 minutes, occasionally lifting upper and lower lids. Obtain medical attention immediately.

Inhalation: Move to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim has ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Obtain medical attention immediately.

Ingestion: *If conscious*, give two (2) glasses of water. **DO NOT INDUCE VOMITING**. Do not give anything by mouth to an unconscious person. Obtain immediate medical attention.

5. FIRE FIGHTING MEASURES

Flash point	Not applicable. Will not burn
Flammable Limits (Lower)	Not applicable
Flammable Limits (Upper)	Not applicable
Auto Ignition Temperature	Not applicable
Combustion and Thermal Decomposition Products	Hydrogen chloride gas, phosgene gas if dried and then heated
Rate of Burning	Does not burn
Explosive Power	Not applicable
Sensitivity to Static Discharge	Not available

Fire and Explosion Hazards: During a fire, irritating/toxic hydrogen chloride, and/or phosgene gases may be generated if material is dried and then heated to decomposition.
Extinguishing Media: The substance is not combustible. Use extinguishing media appropriate to the surrounding fire.
NOTE: Also see "Section 10 – Stability and Reactivity"

6. ACCIDENTAL RELEASE MEASURES

Spills, Leaks, or Release:

- → **Restrict access** until clean-up operations are complete. Wear appropriate Personal Protective Equipment per Section 8. Ensure trained personnel conduct clean up and wear Personal Protective Equipment per Section 8.
- → **Stop leak if possible**. Avoid personal risk.
- → **Notify Authorities** if release exceeds reportable quantity per Section 15

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MATERIAL SAFETY DATA SHEET
Ferrous Chloride

→ **Small Spills** – Absorb spill with clay or dry material or neutralize with lime, limestone or soda ash and collect in appropriate container for disposal. Neutralization with soda ash can generate carbon dioxide so additional ventilation may be necessary.

→ **Large Spills** – Prevent entry into sewers and confined areas. Dike, if possible. Keep unnecessary people away, isolate area and deny entry. Pump liquid material into appropriate vessels as possible or absorb spill with clay absorbents or non-reactive dry materials and collect in appropriate container for disposal.

Neutralize spill residuals carefully with lime, limestone, or soda ash and collect in suitable container for disposal. Flush area with water. This could generate carbon dioxide so additional ventilation may be necessary. Notify the appropriate environmental authorities.

7. HANDLING AND STORAGE

Handling: Handle all chemicals with respect. Review the label, this MSDS and any other applicable information before use. Keep separated from incompatible substances. Use appropriate Personal Protective Equipment per Section 8. Handle only with equipment, materials and supplies specified by their manufacturer as being compatible and appropriate for use with this product.

Storage Requirements:

Bulk storage containers and ancillary fill and feed systems should be constructed out of appropriate materials such as polyethylene, polypropylene, rubber-lined steel and FRP designated as appropriate for use with this product. Storage tanks should be vented to scrubber or exterior atmosphere. Storage facilities should have secondary containment as required by law or regulation. **Storage tanks, piping and offloading points should be labeled with appropriate signage to avoid accidents.**

Some concentrations of this product will freeze or crystallize at low temperatures. Insulate and heat-trace storage tanks, pumps, pipes and ancillary equipment as necessary.

Product should be used within one (1) year.

Material may be stored in tightly closed shipping containers, preferably the supplier containers. 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

Preventive Measures:

Engineering Controls: A ventilation system of local/general exhaust is recommended to keep employee exposure below the Airborne Exposure Limits. Ensure that eyewash station and safety showers are proximal to the workstation location.

Personal Protection Equipment:

Eye Protection: Wear splash resistant chemical goggles and, where splashing is possible, a full face shield. Maintain eye wash fountain and quick-drench facilities in work area.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to avoid skin contact.

Recommended Protective Material: Neoprene

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MATERIAL SAFETY DATA SHEET
Ferrous Chloride

Respiratory Protection: Under conditions of misting or contact with head gases, respiratory protection may be needed. Consider respirator-warning properties before use.

- With limited contact use an appropriate chemical cartridge respirator with acid gas cartridge(s)

- When cleaning, decontaminating or performing maintenance on tanks, containers, piping systems and accessories, and in any other situations where airborne contaminants and/or dust could be generated, use protective equipment to protect against ingestion or inhalation. HEPA or air supplied respirator, full protective coveralls with head cover, gloves and boots or chemical suits, and boots are suggested.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Light green
Odor:	Slight acidic odor
Form:	Liquid
pH as is:	<1
Vapor Pressure (mm Hg):	N/A
Boiling Point:	105 °C - 110 °C (220 °F - 230 °F)
Specific Gravity (20°C):	1.18-1.42
Solubility (water):	soluble
Vapor Density (Air=1):	N/A
Percent Volatile by Vol.:	N/A
Freezing Point:	Concentration dependent (Consult your Kemiron/Eaglebrook representative)

10. STABILITY AND REACTIVITY

Hazardous Decomposition Products: Thermal decomposition: after completely dry and heated to decomposition will produce hydrogen chloride gas and phosgene gas
Chemical Stability: Stable at normal temperatures and pressure.
Conditions to Avoid: Avoid contact with mineral acids, excessive heat and bases/alkalis
Incompatibility with other Substances: Metals, metal alloys, aluminum, stainless steel, carbon, brasses, and nylon.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Not available.

12. ECOLOGICAL INFORMATION

Not available.

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MATERIAL SAFETY DATA SHEET
Ferrous Chloride

13. DISPOSAL CONSIDERATIONS

Review Federal, State, Provincial, and Local government regulations prior to disposal. This material exhibits the characteristic of corrosivity to metals and other building materials and any disposal must comply with hazardous waste disposal requirements. Any residues and/or rinse waters from cleaning of tanks, containers, piping systems and accessories may be a hazardous characteristic waste and must be properly disposed of in accordance with federal, state, provincial and local laws.
RCRA: Test waste material for corrosivity, D002, prior to disposal

14. TRANSPORT INFORMATION

	Canada (TDG)	U.S. (DOT)
Shipping Name	Ferrous Chloride Solution	Ferrous Chloride Solution
Hazard Class/Division	8: Corrosive liquid	8: Corrosive liquid
Identification No.	UN1760	UN1760
Packing Group:	II	II

Transportation Emergency Telephone Numbers:
1-800-424-9300 CHEMTREC (USA)
1-613-996-6666 CANUTEC (CANADA) (CALL COLLECT)

IATA/ICAO Class: 8

15. REGULATORY INFORMATION

USA CLASSIFICATION:

OSHA Classification: Hazardous by definition of Hazard Communication Standard (29 CFR 1920.1200)

CERCLA: Hazardous substance/reportable quantity (RQ): final RQ = 100 lb. (45.4 kg) Based on anhydrous Ferrous Chloride (divide by solution concentration to obtain solution weight)

SARA Regulations sections 313 and 40 CFR 372: No

SARA Hazard Categories, SARA SECTIONS 311/312 (40CRF370.21):

Acute	Yes
Chronic	No
Fire	No
Reactive	No
Sudden Release	No
OSHA Process Safety (29CFR1910.119)	No

Clean Water Act Requirements: Designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance.

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MATERIAL SAFETY DATA SHEET
Ferrous Chloride

TSCA: This substance or all ingredients of this product are listed on the Chemical Substances Inventory of the TSCA. Does not require reporting.

Other Regulations/Legislation which apply to this product:
California Proposition 65: No

Right-To-Know Lists: Massachusetts, New Jersey, Pennsylvania, California
This product does not contain, nor is it manufactured with, ozone-depleting substances.

CANADIAN CLASSIFICATION

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

Controlled Products Regulation (WHMIS) Classification: E: Corrosive

CEPA / Canadian Domestic Substances List (DSL): The substance in this product is on the Canadian Domestic Substances List (CEPA DSL).

EEC CLASSIFICATION

EINECS: 231-729-4

16. OTHER INFORMATION

National Fire Protection Association (NFPA) and Hazardous Materials Identification System (HMIS) Ratings:

	NFPA	HMIS
HEALTH	2	2
FIRE	0	0
REACTIVITY	1	1

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

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MSDS Revised on 10 1 06, 11 21 06, 2 28 07 by Kemira Water Solutions HSE group

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MATERIAL SAFETY DATA SHEET
Polyaluminum Chloride Solution

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

	USA	CANADA
Supplier:	Kemira Water Solutions, Inc. 316 Bartow Municipal Airport Bartow, Florida 33830	Kemira Water Solutions Canada Inc. 3405 Blvd. Marie Victorin Varennes, Québec J3X 1T6
Customer Service Telephones:	(800) 879-6353 (785) 842-7424	(800) 465-6171 (450) 652-0665

(800) 450-7352 - Polymers

Emergency Contacts (24 hr.)

FOR EMERGENCIES INVOLVING CHEMICAL SPILL OR RELEASE, CALL

CHEMTREC	**(800) 424-9300**	**USA (TOLL FREE)**
CANUTEC	**(613) 996-6666**	**CANADA (CALL COLLECT)**

Product Name:	Polyaluminum Chloride Solution
Chemical Family:	Polynuclear inorganic Salt
Formula:	$Al_2(OH)_xCl_{6-x}$ $0<_x>6$
Synonym:	Poly(aluminum hydroxy)chloride; Aluminum chlorohydrate; PAX 10; PAX 11; PAX 14; PAX 18; PAX 28; PAX-XL1; PAX-XL9; PAX-XL19; PAX-XL30; PAX-XL30A; PAX-XL30C; PAX-XL31; PAX-XL31A; PAX-XL31C; PAX-XL32; PAX-XL32A; PAX-XL32C; PAX-XL37; PAX-XL39; PAX-XL39A; PAX-XL39C; PAX-XL60; PAX-XL70; PAX-XL71; PAX-XL72
MSDS Code:	PAX
Acceptable Product Uses:	Water treatment chemical

2. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS Number #	Concentration	ACGIH TWA
Polyaluminum chloride	1327-41-9	8 – 24%	2 mg/m^3 (as Al)

WHMIS Classification: CLASS E
OSHA Classification: Physical: Corrosive Health: Corrosive
Target Organs: None known

3. HAZARDS IDENTIFICATION

Emergency Overview: Irritating to skin, eyes, and mucous membranes.

Carcinogenicity: Does not contain any known carcinogens or potential carcinogens.

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MATERIAL SAFETY DATA SHEET
Polyaluminum Chloride Solution

4. FIRST AID MEASURES

General: If you feel unwell, seek medical attention (show the label or this MSDS if possible). Ensure that medical personnel are aware of the material(s) involved.

Skin Contact: Remove all contaminated clothing, jewelry, and shoes. Remove contaminated clothing and wash before reuse. Wash affected area with soap or mild detergent and running water for at least 15 minutes. If irritation develops, get medical attention.

Eye Contact: Flush immediately with water for at least 15 minutes, occasionally lifting upper and lower lids to be sure rinsing is complete. Get medical attention.

Inhalation: Move to fresh air. Obtain medical attention if cough or other respiratory symptoms develop.

Ingestion: DO NOT INDUCE VOMITING. If conscious, drink water or milk of magnesia. Do not give anything by mouth to an unconscious person. Get medical attention.

5. FIRE FIGHTING MEASURES

Flash point	Not applicable. Will not burn
Flammable Limits (Lower)	Not applicable
Flammable Limits (Upper)	Not applicable
Auto Ignition Temperature	Not applicable
Combustion and Thermal Decomposition Products	Hydrogen chloride may be released in a fire. Aluminum oxide and oxides of sulfur.
Rate of Burning	Does not burn
Explosive Power	Not applicable
Sensitivity to Static Discharge	Not available

Fire and Explosion Hazards: During a fire, irritating/toxic and corrosive fumes may evolve.
Extinguishing Media: The substance is not combustible. Use extinguishing media appropriate to the surrounding fire. Containers can build up pressure in the event of a fire. As in any fire, wear SCBA, pressure demand, pressure-demand and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Spills, Leaks, or Release:

→ **Restrict access** until clean-up operations are complete. Wear appropriate Personal Protective Equipment per Section 8. Ensure trained personnel conduct clean up and wear Personal Protective Equipment per Section 8.

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MATERIAL SAFETY DATA SHEET
Polyaluminum Chloride Solution

→ **Stop discharge if possible**. Avoid personal risk.
→ **Notify Authorities** if release exceeds reportable quantity per Section 15
→ **Small Spills** – Absorb spill with clay or dry material and collect in appropriate container for disposal.
→ **Large Spills** – Prevent entry into sewers and confined areas. Dike, if possible. Keep unnecessary people away, isolate area and deny entry. Collect in appropriate container for disposal.
→ **Neutralize spill residuals** carefully with lime, limestone, or soda ash and collect in a suitable container for disposal. Flush area with water. Notify the appropriate environmental authorities.

7. HANDLING AND STORAGE

Handling: Handle all chemicals with respect. Review the label, this MSDS and any other applicable information before use. Keep separated from incompatible substances. Use appropriate Personal Protective Equipment per Section 8. Handle only with equipment, materials and supplies specified by their manufacturer as being compatible and appropriate for use with this product.

Storage: Material may be stored in tightly closed shipping containers, preferably the supplier's containers. 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. Do not use metal containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Preventive Measures:

Engineering Controls: There should be enough local ventilation to circulate air. Ensure that eyewash station and safety showers are proximal to the workstation location.

Personal Protection Equipment:

Eye Protection: Wear splash resistant chemical goggles and, where splashing is possible, a full face shield. Maintain eye wash fountain and quick-drench facilities in work area.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to avoid skin contact.

Recommended Protective Material: Neoprene, Never use leather.

Respiratory Protection: Consider respirator warning properties before use.

- With limited contact use an appropriate chemical cartridge respirator with acid gas cartridge(s)

- When cleaning, decontaminating or performing maintenance on tanks, containers, piping systems and accessories, and in any other situations where airborne contaminants and/or dust could be generated, use protective equipment to protect against ingestion or inhalation. HEPA or air supplied respirator, full protective coveralls with head cover, gloves and boots or chemical suits, and boots are suggested.

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MATERIAL SAFETY DATA SHEET
Polyaluminum Chloride Solution

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear amber or colorless
Odor:	Pungent chlorine-like odor
Form:	Liquid
pH as is:	0.5-4.4
Vapor Pressure (mm Hg):	ca. 18 mm Hg at 20°C
Boiling Point:	100 – 110 °C
Specific Gravity):	1.15 – 1.40 @ 25 °C
Solubility (water):	soluble
Vapor Density (Air=1):	1.3
Percent Volatile by Vol.:	N/A
Freezing Point:	-20 to -5 °C

10. STABILITY AND REACTIVITY

Hazardous Decomposition Products: Thermal decomposition: after completely dry and heated to decomposition will produce sulfur oxides and aluminum oxides as well as HCl gas.
Chemical Stability: Stable at normal temperatures and pressure.
Conditions to Avoid: Avoid contact with mineral acids, excessive heat and bases/alkalis
Incompatibility with other Substances: Carbon steel, aluminum, carbon, brasses, and nylon.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Not available.

12. ECOLOGICAL INFORMATION

Not available.

13. DISPOSAL CONSIDERATIONS

Review Federal, State, Provincial, and Local government regulations prior to disposal. This material exhibits the characteristic of corrosivity to metals and other building materials and any disposal must comply with hazardous waste disposal requirements. Any residues and/or rinse waters from cleaning of tanks, containers, piping systems and accessories may be a hazardous characteristic waste and must be properly disposed of in accordance with federal, state, provincial and local laws.
RCRA: Test waste material for corrosivity, D002, prior to disposal

14. TRANSPORT INFORMATION

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MATERIAL SAFETY DATA SHEET
Polyaluminum Chloride Solution

	Canada (TDG)	U.S. (DOT)
Shipping Name	Corrosive liquid, acidic, inorganic, NOS.	Corrosive liquid, acidic, inorganic, NOS.
Hazard Class/Division	8	8
Identification No. **Packing Group:**	UN 3264 III	UN 3264 III

Transportation Emergency Telephone Numbers:
1-800-424-9300 CHEMTREC (USA)
1-613-996-6666 CANUTEC (CANADA) (CALL COLLECT)

IATA/ICAO Class: 8

15. REGULATORY INFORMATION

USA CLASSIFICATION:

OSHA Classification: Hazardous by definition of Hazard Communication Standard (29 CFR 1920.1200)

SARA Regulations sections 313 and 40 CFR 372: No

SARA Hazard Categories, SARA SECTIONS 311/312 (40CRF370.21):

Acute	Yes
Chronic	No
Fire	No
Reactive	No
Sudden Release	No
OSHA Process Safety (29CFR1910.119)	No

Clean Water Act Requirements: Designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance.

TSCA: This substance or all ingredients of this product are listed on the Chemical Substances Inventory of the TSCA. Does not require reporting.

Other Regulations/Legislation which apply to this product:
California Proposition 65: No

Right-To-Know Lists: Massachusetts, New Jersey, Pennsylvania, California
This product does not contain, nor is it manufactured with, ozone-depleting substances.

CANADIAN CLASSIFICATION

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

Controlled Products Regulation (WHMIS) Classification: E: Corrosive

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MATERIAL SAFETY DATA SHEET
Polyaluminum Chloride Solution

CEPA / Canadian Domestic Substances List (DSL): The substance in this product is on the Canadian Domestic Substances List (CEPA DSL).

SHELF LIFE: Please use within one year.

16. OTHER INFORMATION

National Fire Protection Association (NFPA) and Hazardous Materials Identification System (HMIS) Ratings:

	NFPA	HMIS
HEALTH	1	1
FIRE	0	0
REACTIVITY	0	0

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

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MSDS Revised on October 1, 2006 by Kemira Water Solutions HSE group

For more information on the use or the performance of our products, or for sample requests please contact your Kemira Water Solutions Representative or Customer Service at the numbers in Section 1 of this MSDS

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MATERIAL SAFETY DATA SHEET
Sodium Aluminate

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

	USA	CANADA
Supplier:	Kemira Water Solutions, Inc. 316 Bartow Municipal Airport Bartow, Florida 33830	Kemira Water Solutions Canada Inc. 3405 Blvd. Marie Victorin Varennes, Québec J3X 1T6
Customer Service Telephones:	(800) 879-6353 (785) 842-7424	(800) 465-6171 (450) 652-0665

(800) 450-7352 - Polymers

Emergency Contacts (24 hr.)

FOR EMERGENCIES INVOLVING CHEMICAL SPILL OR RELEASE, CALL

CHEMTREC	**(800) 424-9300**	**USA (TOLL FREE)**
CANUTEC	**(613) 996-6666**	**CANADA (CALL COLLECT)**

Product Name:	Sodium Aluminate, SAX-19, SAX-19FA, SAX-20, SAX-23, SAX-24, SAX-24E, HanFloc, WataFloc
Chemical Family:	Inorganic Salts
Formula:	$NaAlO_2$
Synonym:	Sodium Aluminate Solution
Acceptable Product Uses:	Water treatment

2. COMPOSITION / INFORMATION ON INGREDIENTS

Component	% (w/w)	ACGIH TWA	CAS NO.
Sodium Aluminate	37-46	2 mg/m^3 (TWA) (as Aluminum salts)	1302-42-7
Sodium Hydroxide	5	2 mg/m^3 (STEL)	1310-73-2

3. HAZARDS IDENTIFICATION

Principal Risk: Irritating to skin, eyes, respiratory and digestive tracts.

Potential Effects on Health: Acute and chronic.

Carcinogenicity: Does not contain any known carcinogens or potential carcinogens.

4. FIRST AID MEASURES

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MATERIAL SAFETY DATA SHEET
Sodium Aluminate

General: If you feel unwell, seek medical attention (show the label or this MSDS if possible). Ensure that medical personnel are aware of the material(s) involved.

Skin Contact: Avoid contact with skin. Remove contaminated clothing, jewelry, and shoes. Wash affected area with soap or mild detergent and running water for at least 15 minutes. If irritation develops, get medical attention.

Eye Contact: Flush immediately with water for at least 15 minutes, occasionally lifting upper and lower lids to be sure rinsing is complete. Get medical attention.

Inhalation: Move to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim has ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Obtain medical attention if cough or other symptoms develop,

Ingestion: DO NOT INDUCE VOMITING. If conscious, give two (2) glasses of water or milk of magnesia. Do not give anything by mouth to an unconscious person. Get medical attention.

5. FIRE FIGHTING MEASURES

Flash point	Not applicable. Will not burn
Flammable Limits (Lower)	Not applicable
Flammable Limits (Upper)	Not applicable
Auto Ignition Temperature	Not applicable
Combustion and Thermal Decomposition Products	Aluminum oxides.
Rate of Burning	Does not burn
Explosive Power	Not applicable
Sensitivity to Static Discharge	Not available

Fire and Explosion Hazards: During a fire, irritating/toxic and corrosive fumes may evolve.
Extinguishing Media: The substance is not combustible. Use extinguishing media appropriate to the surrounding fire.

6. ACCIDENTAL RELEASE MEASURES

Spills, Leaks, or Release:

- → **Restrict access** until clean-up operations are complete. Wear appropriate Personal Protective Equipment per Section 8. Ensure trained personnel conduct clean up and wear Personal Protective Equipment per Section 8.
- → **Stop leak if possible.** Avoid personal risk.

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MATERIAL SAFETY DATA SHEET
Sodium Aluminate

→ **Notify Authorities** if release exceeds reportable quantity per Section 15
→ **Small Spills** – Absorb spill with clay or dry material or neutralize with dilute acid (vinegar preferred) , followed by flushing with water and covering the area with sodium carbonate. Collect the residues in an appropriate container for disposal.
→ **Large Spills** – Prevent entry into sewers and confined areas. Dike, if possible. Keep unnecessary people away, isolate area and deny entry. Pump liquid material into appropriate vessels as possible or absorb spill with clay absorbents or non-reactive dry materials and collect in appropriate container for disposal. Notify the appropriate environmental authorities.

7. HANDLING AND STORAGE

Handling: Handle all chemicals with respect. Review the label, this MSDS and any other applicable information before use. Keep separated from incompatible substances. Use appropriate Personal Protective Equipment per Section 8. Handle only with equipment, materials and supplies specified by their manufacturer as being compatible and appropriate for use with this product.

Storage Requirements:
Handle in containers, piping, and pumps made of steel, stainless steel, FRP or plastic. Avoid prolonged skin contact. Product should be used within one year.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Preventive Measures:

Engineering Controls: A ventilation system of local/general exhaust is recommended to keep employee exposure below the Airborne Exposure Limits. Ensure that eyewash station and safety showers are proximal to the workstation location.

Personal Protection Equipment:

Eye Protection: Wear splash resistant chemical goggles and, where splashing is possible, a full face shield. Maintain eye wash fountain and quick-drench facilities in work area.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to avoid skin contact.

Recommended Protective Material: Neoprene or equivalent. Never use leather.

Respiratory Protection: Under conditions of misting or contact with head gases, respiratory protection may be needed. Consider respirator warning properties before use.

- With limited contact use an appropriate chemical cartridge respirator.

- When cleaning, decontaminating or performing maintenance on tanks, containers, piping systems and accessories, and in any other situations where airborne contaminants and/or dust could be generated, use protective equipment to protect against ingestion or inhalation. Chemical respirator or air supplied respirator, full protective coveralls with head cover, gloves and boots or chemical suits, and boots are suggested.

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MATERIAL SAFETY DATA SHEET
Sodium Aluminate

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Straw Yellow to Amber
Odor:	Odorless
Form:	Liquid
pH as is:	12 for a 1% solution
Vapor Pressure (mm Hg):	N/A
Boiling Point:	110 - 116 °C (230 - 240 °F)
Specific Gravity (25°C):	1.42 – 1.56
Solubility (water):	soluble
Vapor Density (Air=1):	N/A
Percent Volatile by Vol.:	N/A
Freezing Point:	-20 °C (-4 °F)

10 STABILITY AND STORAGE

Hazardous Decomposition Products: Decomposes to toxic fumes of oxides of sodium (Na_2O) when a thermal decomposition occurs.

Chemical Stability: Stable at normal temperatures and pressure. Store at temperature of a minimum of 10 °C (50 °F)

Conditions to Avoid: Contact with strong mineral acids, excessive heat. Do not mix with strong acids without preliminary dilution and agitation to prevent violent or explosive reaction. Product can react explosively with aldehydes and many other organic chemicals.
Avoid contact with mineral acids, excessive heat and bases/alkalis

Incompatibility with other Substances: Corrodes steel. Incompatible with carbon steel, aluminum, carbon, brasses, and nylon.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data: Sodium Aluminate: No quantitative data available.
Sodium hydroxide: Irritation data:
500 mg/24 hour(s) skin-rabbit severe; 400 µg eyes-rabbit mild; 1 percent eyes-rabbit severe;
Toxicity data: 1350 mg/kg skin-rabbit LD_{50}; 104-340 mg/kg oral-rat LD_{50}

Mutagenicity: No data available

Reproductive Effects: No data available

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MATERIAL SAFETY DATA SHEET
Sodium Aluminate

Teratogenicity and Fetotoxicity: No data available

Synergistic Materials: None known

12 ECOLOGICAL INFORMATION

Ecotoxicological Information: Chemical oxygen demand (COD): 1,420 mg/L
Biochemical oxygen demand (5-day BOD): 921 mg/L

Aquatic data: Results shown below are based on similar products.
96 hour static acute LC50 to Rainbow Trout = 172 mg/L
96 hour no observed effect concentration is <100 mg/L based on no mortality or abnormal effects. Toxicity Rating: Moderately toxic.

96 hour static acute LC50 to Fathead Minnow = 530 mg/L
96 hour no observed effect concentration is 400 mg/L based on no mortality or abnormal effects. Toxicity Rating: Moderately toxic.

48 hour static acute LC50 to Daphnia magna = 64 mg/L
48 hour no observed effect concentration is 40 mg/L based on no mortality or abnormal effects. Toxicity Rating: Moderately toxic.

Persistence and Degradation: No data available.

13 DISPOSAL CONSIDERATIONS

Review Federal, State, Provincial, and Local government regulations prior to disposal. This material exhibits the characteristic of corrosivity to metals and other building materials and any disposal must comply with hazardous waste disposal requirements. Any residues and/or rinse waters from cleaning of tanks, containers, piping systems and accessories may be a hazardous characteristic waste and must be properly disposed of in accordance with federal, state, provincial and local laws.
RCRA: Test waste material for corrosivity, D002, prior to disposal

14 TRANSPORT INFORMATION

	Canada (TDG)	U.S. (DOT)
Shipping Name	Sodium Aluminate Solution	Sodium Aluminate Solution
Hazard Class/Division	8 : Corrosive liquid	8 : Corrosive liquid
Identification No.	UN 1819	UN 1819
Packing Group:	II	II

Transportation Emergency Telephone Numbers:
1-800-424-9300 CHEMTREC (USA)
1-613-996-6666 CANUTEC (CANADA) (CALL COLLECT)

IATA/ICAO Class: 8

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MATERIAL SAFETY DATA SHEET
Sodium Aluminate

15 REGULATORY INFORMATION

USA CLASSIFICATION:

OSHA Classification: Hazardous by definition of Hazard Communication Standard (29 CFR 1920.1200)

CERCLA: 1000 liquid pounds.

SARA Regulations sections 313 and 40 CFR 372: Yes

SARA Hazard Categories, SARA SECTIONS 311/312 (40CRF370.21):

Acute	Yes
Chronic	No
Fire	No
Reactive	No
Sudden Release	No
OSHA Process Safety (29CFR1910.119)	No

Clean Water Act Requirements: Designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance.

TSCA: This substance or all ingredients of this product are listed on the Chemical Substances Inventory of the TSCA. Does not require reporting.

Other Regulations/Legislation which apply to this product:
California Proposition 65: No

Right-To-Know Lists: Massachusetts, New Jersey, Pennsylvania, California
This product does not contain, nor is it manufactured with, ozone-depleting substances.

CANADIAN CLASSIFICATION

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

Controlled Products Regulation (WHMIS) Classification: E: Corrosive

CEPA / Canadian Domestic Substances List (DSL): The substances in this product are on the Canadian Domestic Substances List (CEPA DSL). The presence on this list does not trigger any legal reporting.

16 OTHER INFORMATION

National Fire Protection Association (NFPA) and Hazardou System (HMIS) Ratings:

	NFPA	HMIS
HEALTH	3	3

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

For more information on the use or the performance of our products, or for sample reques Water Solutions Representative or Customer Service at the numbers in Secti

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MATERIAL SAFETY DATA SHEET
Sodium Aluminate

FIRE	0	0
REACTIVITY	0	0

Kemira Water Solutions, Inc., and Kemira Water Solutions Canada, Inc. provide the foregoing information in good faith and make no representations as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using the product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.

Kemira Water Solutions, Inc., and Kemira Water Solutions Canada, Inc. make no representations or warranties, either expressed or implied, including without limitation any warranties of merchantability or fitness for a particular purpose with respect to the information set forth herein or the product to which the information refers. Accordingly, Kemira Water Solutions, Inc., and Kemira Water Solutions Canada, Inc. disclaim responsibility for damages resulting from use or reliance upon this information.

MSDS Revised on February 26, 2007 by Kemira Water Solutions HSE group

For more information on the use or the performance of our products, or for sample requests please contact your Kemira Water Solutions Representative or Customer Service at the numbers in Section 1 of this MSDS

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MATERIAL SAFETY DATA SHEET
STERNPAC 70

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

	USA	CANADA
Supplier:	Kemira Water Solutions, Inc. 316 Bartow Municipal Airport Bartow, Florida 33830	Kemira Water Solutions Canada Inc. 3405 Blvd. Marie Victorin Varennes, Québec J3X 1T6
Customer Service Telephones:	(800) 879-6353 (785) 842-7424	(800) 465-6171 (450) 652-0665

(800) 450-7352 - Polymers

Emergency Contacts (24 hr.)

FOR EMERGENCIES INVOLVING CHEMICAL SPILL OR RELEASE, CALL

CHEMTREC	**(800) 424-9300**	**USA (TOLL FREE)**
CANUTEC	**(613) 996-6666**	**CANADA (CALL COLLECT)**

Product Name:	SternPAC™ 70
Chemical Family:	Polynuclear inorganic Salt
Formula:	$Al_{13}(OH)_{27.5}(SO_4)_2Cl_{9.5}$
Synonym:	Polyaluminum chloride, polyhydroxysulphatoaluminum chloride
Acceptable Product Uses:	Coagulant for potable water treatment

2. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS Number #	Concentration
Aluminum chloride hydroxide sulfate	39290-78-3	15-40%

WHMIS Classification: CLASS E
OSHA Classification: Physical: Corrosive
Health: Corrosive

3. HAZARDS IDENTIFICATION

Emergency Overview: Irritating to skin, eyes, and mucous membranes.

Potential Effects on Health:

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MATERIAL SAFETY DATA SHEET
STERNPAC 70

Skin Contact: May cause irritation, swelling, or dermatitis. Prolonged exposure may cause skin irritation. A single, prolonged exposure is not likely to result in the materials being absorbed through the skin in harmful amounts.

Eye Contact: Will cause painful burning or stinging of eyes and lids, watering of eyes, and inflammation of the conjunctiva.

Ingestion: May be harmful if swallowed. May cause nausea and vomiting. May cause liver and kidney effects.

Inhalation: Not a likely route of entry, however, may irritate respiratory tract.

Effects of acute exposure: *Small Quantities*: nausea, vomiting, stomach cramps, diarrhea. *Large Quantities*: Ulcerations and necrosis of the mucous membranes in the throat, mouth, and esophagi plus small quantity effects, liver or kidney damage, intense thirst.

Effects of chronic exposure: Mist will irritate respiratory tract. Possible dermatitis.

Carcinogenicity: Does not contain any known carcinogens or potential carcinogens.

4. FIRST AID MEASURES

General: If you feel unwell, seek medical attention (show the label or this MSDS if possible). Ensure that medical personnel are aware of the material(s) involved.

Skin Contact: Remove all contaminated clothing, jewelry, and shoes. Remove contaminated clothing and wash before reuse. Wash affected area with soap or mild detergent and running water for at least 15 minutes. If irritation develops, get medical attention.

Eye Contact: Flush immediately with water for at least 15 minutes, occasionally lifting upper and lower lids to be sure rinsing is complete. Get medical attention.

Inhalation: Move to fresh air. Obtain medical attention if cough or other respiratory symptoms develop.

Ingestion: DO NOT INDUCE VOMITING. If conscious, drink water or milk of magnesia. Do not give anything by mouth to an unconscious person. Get medical attention.

5. FIRE FIGHTING MEASURES

Flash point	Not applicable. Will not burn
Flammable Limits (Lower)	Not applicable
Flammable Limits (Upper)	Not applicable

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MATERIAL SAFETY DATA SHEET
STERNPAC 70

Auto Ignition Temperature	Not applicable
Combustion and Thermal Decomposition Products	Hydrogen chloride may be released in a fire. Aluminum oxide and oxides of sulfur.
Rate of Burning	Does not burn
Explosive Power	Not applicable
Sensitivity to Static Discharge	Not available

Fire and Explosion Hazards: During a fire, irritating/toxic and corrosive fumes may evolve. **Extinguishing Media:** The substance is not combustible. Use extinguishing media appropriate to the surrounding fire. Containers can build up pressure in the event of a fire. As in any fire, wear SCBA, pressure demand, pressure-demand and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Spills, Leaks, or Release:

- → **Restrict access** until clean-up operations are complete. Wear appropriate Personal Protective Equipment per Section 8. Ensure trained personnel conduct clean up and wear Personal Protective Equipment per Section 8.
- → **Stop discharge if possible.** Avoid personal risk.
- → **Notify Authorities** if release exceeds reportable quantity per Section 15
- → **Small Spills** – Absorb spill with clay or dry material and collect in appropriate container for disposal.
- → **Large Spills** – Prevent entry into sewers and confined areas. Dike, if possible. Keep unnecessary people away, isolate area and deny entry. Collect in appropriate container for disposal.
- → **Neutralize spill residuals** carefully with lime, limestone, or soda ash and collect in a suitable container for disposal. Flush area with water. Notify the appropriate environmental authorities.

7. HANDLING AND STORAGE

Handling: Handle all chemicals with respect. Review the label, this MSDS and any other applicable information before use. Keep separated from incompatible substances. Use appropriate Personal Protective Equipment per Section 8. Handle only with equipment, materials and supplies specified by their manufacturer as being compatible and appropriate for use with this product.

Storage: Material may be stored in tightly closed shipping containers, preferably the supplier's containers. 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. Do not use metal containers. Store in dry rubber lined, plastic, or FRP vessels.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Preventive Measures:

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MATERIAL SAFETY DATA SHEET
STERNPAC 70

Engineering Controls: There should be enough local ventilation to circulate air. Ensure that eyewash station and safety showers are proximal to the workstation location.

Personal Protection Equipment:

Eye Protection: Wear splash resistant chemical goggles and, where splashing is possible, a full face shield. Maintain eye wash fountain and quick-drench facilities in work area.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to avoid skin contact.

Recommended Protective Material: Neoprene, Never use leather.

Respiratory Protection: Consider respirator warning properties before use.

- With limited contact use an appropriate chemical cartridge respirator with acid gas cartridge(s)

- When cleaning, decontaminating or performing maintenance on tanks, containers, piping systems and accessories, and in any other situations where airborne contaminants and/or dust could be generated, use protective equipment to protect against ingestion or inhalation. HEPA or air supplied respirator, full protective coveralls with head cover, gloves and boots or chemical suits, and boots are suggested.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear amber or colorless
Odor:	Slight
Form:	Liquid
pH as is:	2.5 +/- 0.5
Vapor Pressure (mm Hg):	17 mm Hg at 20°C
Boiling Point:	Approx 102 °C
Specific Gravity):	1.225 +/- 0.10
Solubility (water):	soluble
Vapor Density (Air=1):	1.3
Percent Volatile by Vol.:	N/A
Freezing Point:	-10 +/- 2 °C

10. STABILITY AND REACTIVITY

Hazardous Decomposition Products: Thermal decomposition: after completely dry and heated to decomposition will produce sulfur oxides and aluminum oxides as well as HCl gas.

Chemical Stability: Stable at normal temperatures and pressure.

Conditions to Avoid: Avoid contact with mineral acids, excessive heat and bases/alkalis

Incompatibility with other Substances: Carbon steel, aluminum, carbon, brasses, and nylon.

Hazardous Polymerization: Will not occur.

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MATERIAL SAFETY DATA SHEET
STERNPAC 70

11. TOXICOLOGICAL INFORMATION

Acute Oral Toxicity: Not available

Acute Intraperitoneal Toxicity: Not available

Carcinogenicity: Not considered carcinogenic by NTP, IARC, or OSHA.

Irritancy of Product: Moderate skin and eye.

Toxicologically Synergistic Products: None known Not available.

12. ECOLOGICAL INFORMATION

Total organic carbon : < 2.0 ppm

Daphnia Magna: 48 HR ACUTE LC_{50}: 1698 ppm

Rainbow trout: 96 HR ACUTE LC_{50}: 1768 ppm

Fathead minnow: 96 HR ACUTE LC_{50}: 1074 ppm
NOEC: 20 ppm LOEC: 39 ppm

Ceriodaphnia Dubia: 48 HR ACUTE LC_{50}: 1106 ppm
NOEC: 625 ppm LOEC: 1250 ppm

13. DISPOSAL CONSIDERATIONS

Review Federal, State, Provincial, and Local government regulations prior to disposal. This material exhibits the characteristic of corrosivity to metals and other building materials and any disposal must comply with hazardous waste disposal requirements. Any residues and/or rinse waters from cleaning of tanks, containers, piping systems and accessories may be a hazardous characteristic waste and must be properly disposed of in accordance with federal, state, provincial and local laws.

14. TRANSPORT INFORMATION

Shipping Name: Corrosive liquid, acidic, organic NOS
(Aluminum chloride hydroxide sulfate)

Hazardous Class: 9

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MATERIAL SAFETY DATA SHEET
STERNPAC 70

UN Number: 3264

Packing Group III **IMO Class:** 8 **IATA/ICAO Class:** 8

Transportation Emergency Telephone Numbers:
1-800-424-9300 CHEMTREC (USA)
1-613-996-6666 CANUTEC (CANADA) (CALL COLLECT)

15. REGULATORY INFORMATION

USA CLASSIFICATION:

OSHA Classification: Hazardous by definition of Hazard Communication Standard (29 CFR 1920.1200)

SARA Regulations sections 313 and 40 CFR 372: No

SARA Hazard Categories, SARA SECTIONS 311/312 (40CRF370.21):

Acute	Yes
Chronic	No
Fire	No
Reactive	No
Sudden Release	No
OSHA Process Safety (29CFR1910.119)	No

Clean Water Act Requirements: Designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance.

TSCA: This substance or all ingredients of this product are listed on the Chemical Substances Inventory of the TSCA. Does not require reporting.

Other Regulations/Legislation which apply to this product:
California Proposition 65: No

Right-To-Know Lists: Massachusetts, New Jersey, Pennsylvania, California
This product does not contain, nor is it manufactured with, ozone-depleting substances.

CANADIAN CLASSIFICATION

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

Controlled Products Regulation (WHMIS) Classification: E: Corrosive

CEPA / Canadian Domestic Substances List (DSL): The substance in this product is on the Canadian Domestic Substances List (CEPA DSL).

SHELF LIFE: Please use within one year.

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MATERIAL SAFETY DATA SHEET
STERNPAC 70

16. OTHER INFORMATION

National Fire Protection Association (NFPA) and Hazardous Materials Identification System (HMIS) Ratings:

	NFPA	HMIS
HEALTH	1	1
FIRE	0	0
REACTIVITY	0	0

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

Kemira Water Solutions, Inc., and Kemira Water Solutions of Canada, Inc. provide the foregoing information in good faith and make no representations as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using the product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.

Kemira Water Solutions, Inc., and Kemira Water Solutions of Canada, Inc. make no representations or warranties, either expressed or implied, including without limitation any warranties of merchantability or fitness for a particular purpose with respect to the information set forth herein or the product to which the information refers. Accordingly, Kemira Water Solutions, Inc., and Kemira Water Solutions of Canada, Inc. disclaim responsibility for damages resulting from use or reliance upon this information.

MSDS Revised on October 1, 2006 by Kemira Water Solutions HSE group

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MATERIAL SAFETY DATA SHEET
STERNPAC™

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

	USA	CANADA
Supplier:	Kemira Water Solutions, Inc. 316 Bartow Municipal Airport Bartow, Florida 33830	Kemira Water Solutions, Inc. of Canada 3405 Blvd. Marie Victorin Varennes, Québec J3X 1T6
Customer Service Telephones:	(800) 879-6353 (785) 842-7424	(800) 465-6171 (450) 652-0665

(800) 450-7352 - Polymers

Emergency Contacts (24 hr.)

FOR EMERGENCIES INVOLVING CHEMICAL SPILL OR RELEASE, CALL

CHEMTREC	**(800) 424-9300**	**USA (TOLL FREE)**
CANUTEC	**(613) 996-6666**	**CANADA (CALL COLLECT)**

SternPAC™

Chemical Family:	Polynuclear inorganic Salt
Formula:	$Al_{13}(OH)_{20}(SO_4)_2Cl_{15}$
Synonym:	Polyaluminum chloride, polyhydroxysulphatoaluminum chloride
Acceptable Product Uses:	Coagulant for potable water treatment

2. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS Number #	Concentration
Aluminum chloride hydroxide sulfate	39290-78-3	15-40%

WHMIS Classification: CLASS E
OSHA Classification: Physical: Corrosive
Health: Corrosive

3. HAZARDS IDENTIFICATION

Emergency Overview: Irritating to skin, eyes, and mucous membranes.

Carcinogenicity: Does not contain any known carcinogens or potential carcinogens.

4. FIRST AID MEASURES

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MATERIAL SAFETY DATA SHEET
STERNPAC™

General: If you feel unwell, seek medical attention (show the label or this MSDS if possible). Ensure that medical personnel are aware of the material(s) involved.

Skin Contact: Remove all contaminated clothing, jewelry, and shoes. Remove contaminated clothing and wash before reuse. Wash affected area with soap or mild detergent and running water for at least 15 minutes. If irritation develops, get medical attention.

Eye Contact: Flush immediately with water for at least 15 minutes, occasionally lifting upper and lower lids to be sure rinsing is complete. Get medical attention.

Inhalation: Move to fresh air. Obtain medical attention if cough or other respiratory symptoms develop.

Ingestion: DO NOT INDUCE VOMITING. If conscious, drink water or milk of magnesia. Do not give anything by mouth to an unconscious person. Get medical attention.

5. FIRE FIGHTING MEASURES

Flash point	Not applicable. Will not burn
Flammable Limits (Lower)	Not applicable
Flammable Limits (Upper)	Not applicable
Auto Ignition Temperature	Not applicable
Combustion and Thermal Decomposition Products	Hydrogen chloride may be released in a fire. Aluminum oxide and oxides of sulfur.
Rate of Burning	Does not burn
Explosive Power	Not applicable
Sensitivity to Static Discharge	Not available

Fire and Explosion Hazards: During a fire, irritating/toxic and corrosive fumes may evolve.
Extinguishing Media: The substance is not combustible. Use extinguishing media appropriate to the surrounding fire. Containers can build up pressure in the event of a fire. As in any fire, wear SCBA, pressure demand, pressure-demand and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Spills, Leaks, or Release:

- → **Restrict access** until clean-up operations are complete. Wear appropriate Personal Protective Equipment per Section 8. Ensure trained personnel conduct clean up and wear Personal Protective Equipment per Section 8.
- → **Stop discharge if possible.** Avoid personal risk.
- → **Notify Authorities** if release exceeds reportable quantity per Section 15

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MATERIAL SAFETY DATA SHEET
STERNPAC™

→ **Small Spills** – Absorb spill with clay or dry material and collect in appropriate container for disposal.
→ **Large Spills** – Prevent entry into sewers and confined areas. Dike, if possible. Keep unnecessary people away, isolate area and deny entry. Collect in appropriate container for disposal.
→ **Neutralize spill residuals** carefully with lime, limestone, or soda ash and collect in a suitable container for disposal. Flush area with water. Notify the appropriate environmental authorities.

7. HANDLING AND STORAGE

Handling: Handle all chemicals with respect. Review the label, this MSDS and any other applicable information before use. Keep separated from incompatible substances. Use appropriate Personal Protective Equipment per Section 8. Handle only with equipment, materials and supplies specified by their manufacturer as being compatible and appropriate for use with this product.

Storage: Material may be stored in tightly closed shipping containers, preferably the supplier's containers. 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. Do not use metal containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Preventive Measures:

Engineering Controls: There should be enough local ventilation to circulate air. Ensure that eyewash station and safety showers are proximal to the workstation location.

Personal Protection Equipment:

Eye Protection: Wear splash resistant chemical goggles and, where splashing is possible, a full face shield. Maintain eye wash fountain and quick-drench facilities in work area.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to avoid skin contact.

Recommended Protective Material: Neoprene, Never use leather.

Respiratory Protection: Consider respirator warning properties before use.

- With limited contact use an appropriate chemical cartridge respirator with acid gas cartridge(s)

- When cleaning, decontaminating or performing maintenance on tanks, containers, piping systems and accessories, and in any other situations where airborne contaminants and/or dust could be generated, use protective equipment to protect against ingestion or inhalation. HEPA or air supplied respirator, full protective coveralls with head cover, gloves and boots or chemical suits, and boots are suggested.

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MATERIAL SAFETY DATA SHEET
STERNPAC™

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear amber or colorless
Odor:	Slight
Form:	Liquid
pH as is:	2.6 +/- 0.3
Vapor Pressure (mm Hg):	17 mm Hg at 20°C
Boiling Point:	Approx 102 °C
Specific Gravity):	68.4 lb/ft^3 firmly packed
Solubility (water):	soluble
Vapor Density (Air=1):	1.3
Percent Volatile by Vol.:	N/A
Freezing Point:	-12 +/- 2 °C

10. STABILITY AND REACTIVITY

Hazardous Decomposition Products: Thermal decomposition: after completely dry and heated to decomposition will produce sulfur oxides and aluminum oxides as well as HCl gas.
Chemical Stability: Stable at normal temperatures and pressure.
Conditions to Avoid: Avoid contact with mineral acids, excessive heat and bases/alkalis
Incompatibility with other Substances: Carbon steel, aluminum, carbon, brasses, and nylon.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Not available.

12. ECOLOGICAL INFORMATION

Not available.

13. DISPOSAL CONSIDERATIONS

Review Federal, State, Provincial, and Local government regulations prior to disposal. This material exhibits the characteristic of corrosivity to metals and other building materials and any disposal must comply with hazardous waste disposal requirements. Any residues and/or rinse waters from cleaning of tanks, containers, piping systems and accessories may be a hazardous characteristic waste and must be properly disposed of in accordance with federal, state, provincial and local laws.
RCRA: Test waste material for corrosivity, D002, prior to disposal

14. TRANSPORT INFORMATION

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MATERIAL SAFETY DATA SHEET
STERNPAC™

	Canada (TDG)	U.S. (DOT)
Shipping Name	Corrosive liquid, acidic, inorganic, NOS.	Corrosive liquid, acidic, inorganic, NOS.
Hazard Class/Division	8	8
Identification No. **Packing Group:**	UN 3264 III	UN 3264 III

Transportation Emergency Telephone Numbers:
1-800-424-9300 CHEMTREC (USA)
1-613-996-6666 CANUTEC (CANADA) (CALL COLLECT)

IATA/ICAO Class: 8

15. REGULATORY INFORMATION

USA CLASSIFICATION:

OSHA Classification: Hazardous by definition of Hazard Communication Standard (29 CFR 1920.1200)

SARA Regulations sections 313 and 40 CFR 372: No

SARA Hazard Categories, SARA SECTIONS 311/312 (40CRF370.21):

Acute	Yes
Chronic	No
Fire	No
Reactive	No
Sudden Release	No
OSHA Process Safety (29CFR1910.119)	No

Clean Water Act Requirements: Designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance.

TSCA: This substance or all ingredients of this product are listed on the Chemical Substances Inventory of the TSCA. Does not require reporting.

Other Regulations/Legislation which apply to this product:
California Proposition 65: No

Right-To-Know Lists: Massachusetts, New Jersey, Pennsylvania, California
This product does not contain, nor is it manufactured with, ozone-depleting substances.

CANADIAN CLASSIFICATION

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

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MATERIAL SAFETY DATA SHEET
STERNPAC™

Controlled Products Regulation (WHMIS) Classification: E: Corrosive

CEPA / Canadian Domestic Substances List (DSL): The substance in this product is on the Canadian Domestic Substances List (CEPA DSL).

SHELF LIFE: Please use within one year.

16. OTHER INFORMATION

National Fire Protection Association (NFPA) and Hazardous Materials Identification System (HMIS) Ratings:

	NFPA	HMIS
HEALTH	1	1
FIRE	0	0
REACTIVITY	0	0

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

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MSDS Revised on October 1, 2006 by Kemira Water Solutions HSE group

For more information on the use or the performance of our products, or for sample requests please contact your Kemira Water Solutions Representative or Customer Service at the numbers in Section 1 of this MSDS

Recommended Supplier	Kemira												
Sum of 2008 Price													
State	Location	Chemical	Concentration	Annual Volume	Unit of Measure	Container Type	Shipment Quanity	Shipment Type	2008 Price	Total	Yearly Total		
IA - AWE	Sioux City WWTP	Ferric Chloride	38%	5610000	wet lbs	Bulk	4000	Gallon	$ 0.0720	$0.0720	403,920.00		

Supplier	Kemira									
Sum of 2008 Price										
State	Location	Chemical	Concentration	Annual Volume	Unit of Measure	Container Type	Shipment Quanity	Shipment Type	2008 Price	Yearly Total
KY	Owenton Water	Ferric Chloride	40%	500,000.00	wet lbs	Bulk	3,000.00	Gallons	$ 0.1090	$54,500.00

Current Supplier:	Kemira formerly Kemiron									
State	Location	Chemical	Concentration	Annual Volume	Unit of Measure	Container Type	Shipment Quanity	Shipment Type	2008 Cost	Yearly Total
MO	Jefferson City	Ferric Sulfate	50 or 60 %	361,136.00	wet lbs	Bulk	44000	lbs	$ 0.0770	$27,807.47
MO	St. Joseph	Ferric Sulfate	50 or 60 %	650,000.00	wet lbs	Bulk	46000	lbs	$ 0.0900	$58,500.00
MO	St. Louis - Central	Ferric Sulfate	60%	2,376,662.00	wet lbs	Bulk	45000	lbs	$ 0.0880	$209,146.26
MO	St. Louis - Central	Ferric Sulfate - Dry	Neat	3,188,402.00	dry lbs	Bulk	50000	lbs	$ 0.1560	$497,390.71
MO	St. Louis - Meramec	Ferric Sulfate	60%	1,172,308.00	wet lbs	Bulk	45000	lbs	$ 0.0880	$103,163.10
MO	St. Louis - Meramec	Ferric Sulfate - Dry	Neat	424,992.00	dry lbs	Bulk	52000	lbs	$ 0.1560	$66,298.75
MO	St. Louis - North	Ferric Sulfate - Dry	Neat	180,305.00	dry lbs	Bulk	52000	lbs	$ 0.1570	$28,307.89
MO	St. Louis - South	Ferric Sulfate	60%	1,801,514.00	wet lbs	Bulk	46000	lbs	$ 0.0880	$158,533.23

Current Supplier	Kemira formerly Kemiron									
State	Location	Chemical	Concentration	Annual Volume	Unit of Measure	Container Type	Shipment Quanity	Shipment Type	2008 Cost	Yearly Total
NJ	JBTP & SRTP	Polyaluminum - Chloride	(10.2% Aluminum oxide, 50% basicity) SternPac	3,287,988.00	wet lbs	Bulk	4500 JB/4650 SR	Gallon	$ 0.1700	$558,957.96
NJ	Lakewood	Polyaluminum - Chloride	(10.2% Aluminum oxide, 50% basicity) SternPac	600,430.00	wet lbs	Bulk	6000	Gallon	$ 0.1700	$102,073.10

Current Supplier	Kemira formerly Kemiron									
State	Location	Chemical	Concentration	Annual Volume	Unit of Measure	Container Type	Shipment Quanity	Shipment Type	2008 Cost	Yearly Total
NY - AWE	Buffalo	Polyaluminum - Chloride	Sternpac 70	3,000,000.00	wet lbs	Bulk	46000	Bulk	$ 0.1500	$450,000.00

Current Supplier:	Kemira formerly Kemiron									
State	Location	Chemical	Concentration	Annual Volume	Unit of Measure	Container Type	Shipment Quanity	Shipment Type	2008 Cost	Yearly Total
NC - AWE	Lee County	Polyaluminum - Chloride	PAC - 6803 (25-50% AlChloro, 0-5% Polyamine)	88,000.00	wet lbs	Bulk	46000	Bulk	$ 0.2840	$24,992.00

Recommended Supplier	Kemira									
Count of 2008 Price										
State	Location	Chemical	Concentration	Annual Volume	Unit of Measure	Container Type	Shipment Quanity	Shipment Type	2008 Price	Yearly Total
WV	Bluefield	Polyaluminum - Chloride	10.2% Aluminum Oxide, 52% basicity	130,258.00	wet lbs	Bulk	4000	Gallon	$ 0.1650	$ 21,492.57
	Bluestone	Polyaluminum - Chloride	SternPAC - 10.2% Aluminum Oxide, 52% basicity	365,250.00	wet lbs	Bulk	4000	Gallon	$ 0.1650	$ 60,266.25
	Huntington	Ferric Sulfate	0% Manganese	4,363,769.00	wet lbs	Bulk	4400	lbs	$ 0.1026	$447,722.70
	Montgomery	Polyaluminum - Chloride	(10.2% Aluminum Oxide, 52% basicity) SternPac	66,411.00	wet lbs	Bulk	4000	Gallon	$ 0.1650	$ 10,957.82
	New River	Polyaluminum - Chloride	10.2% Aluminum Oxide, 52% basicity	294,000.00	wet lbs	Bulk	4000	Gallon	$ 0.1650	$ 48,510.00