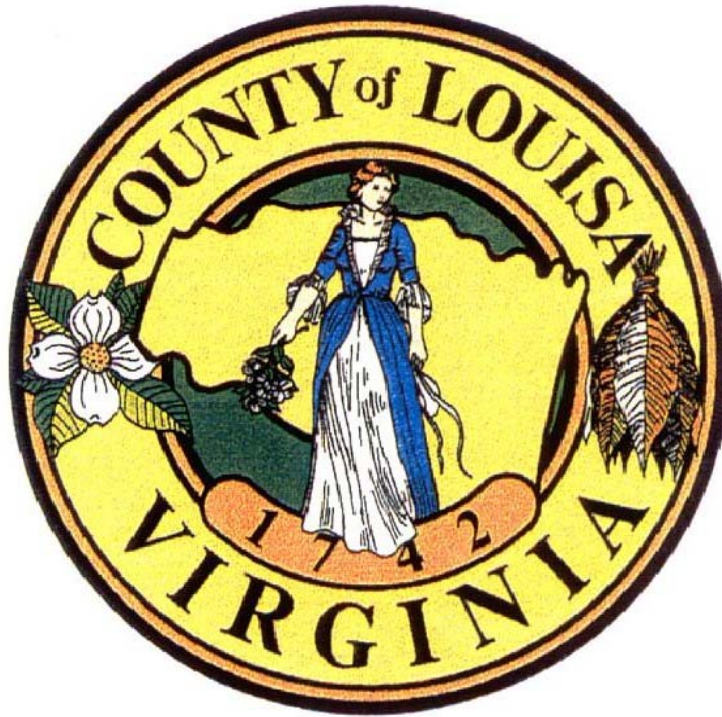




COUNTY OF LOUISA, VIRGINIA

**REQUEST FOR PROPOSAL (RFP)
FOR**

**BENCH AND PILOT STUDIES FOR ZINC AND COPPER
REMOVAL AT ZION CROSSROADS WASTEWATER
TREATMENT PLANT (WWTP)**

RFP# WA-11-04

JUNE 17, 2011

**REQUEST FOR PROPOSAL
(RFP)**

Issue Date: Friday, June 17, 2011

RFP# WA-11-04

Title: Bench and Pilot Studies for Zinc and Copper Removal at Zion Crossroads WWTP

Issuing Agency: County of Louisa, Virginia

Attn: April Lowe

PO Box 160

Louisa, VA 23093

Location Where Work Will Be Performed: County of Louisa, Virginia

Period of Contract: From December 1, 2011 Through Completion

Renewable: N/A

Proposals Will Be Received Until: Tuesday, June 28, 2011, by 2:00 p.m., local time prevailing

Direct All Inquiries for Information To: April Lowe, Purchasing Officer

Post Office Box 160

1 Woolfolk Avenue

Louisa, VA 23093

(540) 967-3499

alowe@louisa.org

IF PROPOSALS ARE MAILED, SEND DIRECTLY TO ISSUING AGENCY SHOWN ABOVE. IF PROPOSALS ARE HAND DELIVERED, DELIVER TO:

County of Louisa
Louisa County Administration Building
Attn: April Lowe
Finance Department, 2nd Floor
1 Woolfolk Avenue
Louisa, Virginia 23093
(540) 967-3499

Note: This public body does not discriminate against faith-based organizations in accordance with the *Code of Virginia*, § 2.2-4343.1 or against a bidder or offeror because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment.

REQUEST FOR PROPOSAL TITLE PAGE

REQUEST NUMBER: WA-11-04 **ISSUE DATE:** 06/17/11

TITLE: Bench and Pilot Studies for Zinc and Copper Removal at Zion Crossroads WWTP

In compliance with this Request for Proposal and to all the conditions imposed herein, by signing below, Offeror:

- (1) Offers and agrees to furnish the goods/services in accordance with the attached signed proposal;
- (2) Agrees that upon Louisa County's written acceptance of Offeror's response to the Request for Proposal, a valid and binding contract for services exists between Offeror and Louisa County;
- (3) Agrees that the Contract Documents will consist of, and *only* of, the Request for Proposal, Louisa County Water Authority Standard Terms and Conditions and Offeror's response to the Request for Proposal;
- (4) Certifies and warrants that the individual signing on Offeror's behalf is authorized to bind the Offeror in any and all contractual matters relating to this Request for Proposal;
- (5) Certifies and warrants that neither Offeror, nor the individual signing on Offeror's behalf, has any business or personal relationships with any other persons, including Louisa County employees, or companies that are in conflict with the Commonwealth of Virginia's Conflict of Interest Act, or the Louisa County Water Authority Standard Terms and Conditions; and,
- (6) Certifies and warrants that the Offeror is properly licensed for providing the goods/services specified in the Request for Proposal and has the appropriate License or Certificate and classification(s) required to perform the work included in the scope of the proposal documents, prior to submitting the proposal, in accordance with Title 54.1, Chapter 11 of the Code of Virginia. If an Offeror shall fail to obtain the required license prior to submission of his proposal, he shall be deemed to be in violation of § 54.1-1115 of the *Code of Virginia* (1950), as amended, and his proposal will not be considered.

Sign in ink and type or print requested information.

Legal Name and Address of Firm:

_____	Date: _____
_____	By: _____
_____	(Signature)
_____	Name: _____
FEI/FIN/SSN: _____	(Please Print)
Fax Number: _____	Title: _____
E-mail Address: _____	Telephone Number: _____

Please provide the following if applicable to this RFP:
Virginia Contractor License # _____ SCC ID # _____

Offeror shall ascertain prior to submitting a response that all Addenda issued have been received and shall **acknowledge receipt and inclusion of all Addenda here:**

Addendum #: _____	Date Issued: _____
Addendum #: _____	Date Issued: _____
Addendum #: _____	Date Issued: _____

Information the Offeror deems Proprietary is included in this response in the separate section of the proposal identified immediately below.

This Title Page MUST be Submitted as Part of your Proposal

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I. PURPOSE:

The County of Louisa, on behalf of the Louisa County Water Authority, invites qualified vendors to submit proposals for providing bench and pilot studies for zinc and copper removal at Zion Crossroads Wastewater Treatment Plant (WWTP).

The County of Louisa reserves the right to award to more than one Offeror.

Louisa County will select the firm(s) who they determine most closely satisfies the needs of the County. There is no requirement for acceptance of the lowest cost of service offered, and specific requirements may be waived or amended at the discretion of the County.

II. STATEMENT OF NEEDS/ SCOPE OF SERVICES:

The Zion Crossroads WWTP Virginia Pollutant Discharge Elimination System (VPDES) permit establishes standards of 50 µ/L and 5.7 µ/L for zinc and copper, respectively. These standards must be met by December 4, 2012. The Zion Crossroads plant is a sequencing batch reactor plant with a capacity of .1mgd. It is undergoing an upgrade of its capacity to .311mgd and its process to continuous flow with many improved features, such as an equalization basin, etc. Flow diagrams of the existing and expanded plants are attached. The upgrades to the plant are expected to come into operation in late Fall 2012, just as or after the Sequestering Batch Reservoir (SBR) plant must be in compliance with its metals limits.

The Authority has identified two substances on which it desires to conduct bench testing AND plant-level pilot studies. These studies are to be performed on the existing plant, to help it meet its metals limits by the deadline, AND for the new plant when it comes on line. In order to help keep costs down, sampling for the studies will be collected by Authority personnel. Sample testing will be performed by the Authority's contract laboratory, Environmental Systems Services, Ltd. (ESS). A similar effort is presently being conducted at the Louisa Regional Sewage Treatment Plant and all data from that endeavor will be made available.

The substances the Authority wishes to study are Sludge Process Enhancement Consultants, Inc.'s "Thio-Red" [polythiocarbonate] AND Jenfitch, Inc.'s "JC 9830" [calcium polysulfide] metals precipitants. Offerors are free to propose additional substances and processes for study that may prove to be better and more cost effective at metals removal. Such additional proposals should include study designs and support appropriate to their chemistry but similar in purpose as those addressed herein. Information in the Authority's possession, provided by the vendors about their precipitants is attached.

The bench analysis design shall provide written direction to Authority personnel for the proper collection and sampling regimen needed to obtain minimally sufficient information to develop feed rates, ranges and protocols needed to conduct the plant level pilot study AND assure the effects on other plant parameters are understood and controlled to avoid any parameter violations during the pilot. Necessary equipment to obtain the samples shall be described. Lab testing will be provided by the Authority's contract laboratory and data will be provided to offeror for evaluation, reporting and analysis, to prepare recommendations. The pilot study shall evaluate metals removal and plant performance for each proposed substance. Written guidance for the study shall be provided based on physical plant conditions, chemical application requirements, and laboratory analyses needed to assess both negative and positive effects on the biological processes of the plant and the effectiveness of each substance at zinc and copper removal.

Based upon its analysis of the data collected, Offeror shall make recommendations for the optimal use of each substance analyzed to maximize the effectiveness of the plant's biological operation and metals

removal. Offeror shall also evaluate the regulatory status of the plant's biosolids or other waste stream flows.

At the conclusion of the studies, a bound report shall be prepared containing all raw data and other pertinent information deemed to be beneficial in assessing the effectiveness of each chemical evaluated. This report shall also provide feed rates and associated costs for using each chemical showing positive removal capabilities, suitable for presentation to the Department of Environmental Quality (DEQ) as a proposal. Any unusual conditions or other concerns noted during the study shall be presented, as well as savings achieved by eliminating or reducing existing processes/expenses. Based on effectiveness, cost and compatibility with the treatment plant biological processes, Offeror shall recommend any and all products deemed to meet criteria for long term implementation in the treatment processes of the plant.

Proposals shall present price quotes categorized by the substance being evaluated. Each quote shall be inclusive of both bench test design/evaluation and pilot study design/evaluation. The proposal shall include a proposed schedule for both bench and pilot testing, with major milestones and associated proposed dates that will allow the plant to meet its December 4, 2012 deadline.

III. OFFEROR'S INSTRUCTION:

A. PROPOSAL PREPARATION:

1. The Offeror must submit a proposal, which demonstrates and provides evidence that the Offeror has the capabilities, professional expertise, and experience to provide the necessary services as described in this RFP. The Offeror shall ensure that all information required herein is submitted with the proposal. All information provided should be verifiable by documentation requested by the County of Louisa. Failure to provide all information, inaccuracy or misstatement may be sufficient cause for rejection of the proposal or rescission of an award. **Each copy of the proposal should be bound with all documentation in a single volume where practical.**
2. Proposals shall be signed by the authorized representative of the Offeror.
3. Proposals should be prepared simply and economically, providing a straightforward, concise, detailed description of capabilities to satisfy the requirements of the RFP.
4. All expenses for making proposals to the County shall be incurred by the Offeror.
5. Offeror must be authorized to transact business in Virginia as a domestic or foreign business entity as required by the State Corporation Commission, if such is required by law. Such status shall be maintained during the term of a contract. A contract entered into by a business in violation of the requirements is voidable at the option of the public body.

B. PROPOSAL SUBMISSION: The following documents must be received in our office via hard copy no later than the closing date and time stated below:

1. Your original proposal, along with five (5) additional copies. If applicable, please also include a redacted copy which does not include trade secrets or proprietary information.
2. Signed original of the completed Request for Proposal Title Page
3. Signed Appendix A "Louisa County Water Authority Standard Terms and Conditions."

4. A list of Offerors proposed staffing to provide services; including primary and back up assignments. Include resumes and credentials for the personnel to be assigned to this service contract. The personnel named in the proposal shall remain assigned to the project throughout the period of the service contract. No replacement may be made without submission of a resume and credentials for approval by the County.
5. A list of client references of similar service contracts, including at least three (3) customers. These references must include name, address, and telephone number.
6. A copy of any applicable Federal, State, or Local license required to legally perform the service, or sell the goods specified in the RFP shall be attached to the proposal.

The RFP number and closing date must be clearly marked on the outside of the envelope.

This solicitation will close on Tuesday, June 28, 2011, at 2:00 p.m., local time prevailing.

Return the proposal to:

Mail to: (US Mail)
County of Louisa
PO Box 160
Louisa, VA 23093
Attn: April Lowe
(540) 967-3499

or Hand Delivery (FEDEX, UPS, etc.)
County of Louisa
Louisa County Administration Building
Finance Department, 2nd Floor
1 Woolfolk Avenue
Louisa, VA 23093
Attn: April Lowe
(540) 967-3499

- C. SUBMISSION OF PROPRIETARY INFORMATION:** All information submitted to the County in response to this solicitation will constitute public information and will be available to the public for inspection upon request pursuant to the Virginia Freedom of Information Act (FOIA).

Pursuant to Virginia Code Section 2.2-4342 and County of Louisa Code Section 60-24, a Bidder/Offeror may request an exception to disclosure for trade secrets or proprietary information as such is defined under Virginia Code Section 59.1-336, part of the Uniform Trade Secrets Act.

In order to claim this exemption, the Bidder/Offeror shall perform ALL of the following: (i) include a written request indicating Bidder/Offeror's desire to invoke the protections of Virginia Code Section 2.2-4342 with submitted proposal materials/data; (ii) specifically identify the data or other materials to be protected by clearly labeling each page containing applicable data as PROPRIETARY; and (iii) to the County's satisfaction, articulate the rationale for why protection for the particular data or materials is necessary. The classification of an entire bid or proposal document, line item prices and/or total bid or proposal prices as proprietary or trade secrets is not acceptable.

Without waiving sovereign immunity or any other available defenses, the County asserts that failure to meet all of these requirements will result in the data or materials being open for inspection in response to a valid inquiry under FOIA and will serve to waive any

right of the Bidder/Offeror to assert a claim against the County for disclosure of trade secrets or proprietary information.

Bidder/Offeror shall be responsible for intervening and defending, at its expense, any demands made upon the County by third parties for production of any such items.

- D. RECEIPT OF PROPOSALS/LATE PROPOSALS:** It is the Offerors responsibility to ensure that his/her proposal is received prior to or at the specific time and the place designated in the solicitation. **Proposals received after the date and time specified shall not be considered.**

No responsibility will be attached to any County personnel for the premature opening of a proposal not properly addressed and identified on the outside of a sealed envelope.

IV. PROPOSAL EVALUATION PROCESS:

The County of Louisa shall appoint a Selection Committee to review and evaluate all proposals submitted by Offerors responding to this RFP. The proposals will be evaluated and ranked based on the Evaluation Criteria listed in Section V. The County of Louisa may ask top ranked Offerors to attend a presentation discussion as part of the evaluation process. Firms invited to the discussion should be prepared to have general discussions on non-binding estimates of cost to provide requested services. At the conclusion of the evaluation process, the County will select one or more firms with whom final negotiations will be conducted in an effort to obtain a contract.

V. PROPOSAL EVALUATION CRITERIA

The respondents will be evaluated on the following criteria:

1. Experience, competence, and credentials of the Offeror
2. Project approach
3. Price
4. Proposed Schedule

The selection process shall be governed by and completed in accordance with the Louisa County Procurement Ordinance. If any provision of this Request for Proposal shall be found to be inconsistent or in conflict with such policy, the terms of the ordinance shall govern.

The County of Louisa reserves the right to reject any or all proposals.

VI. FLOW DIAGRAMS

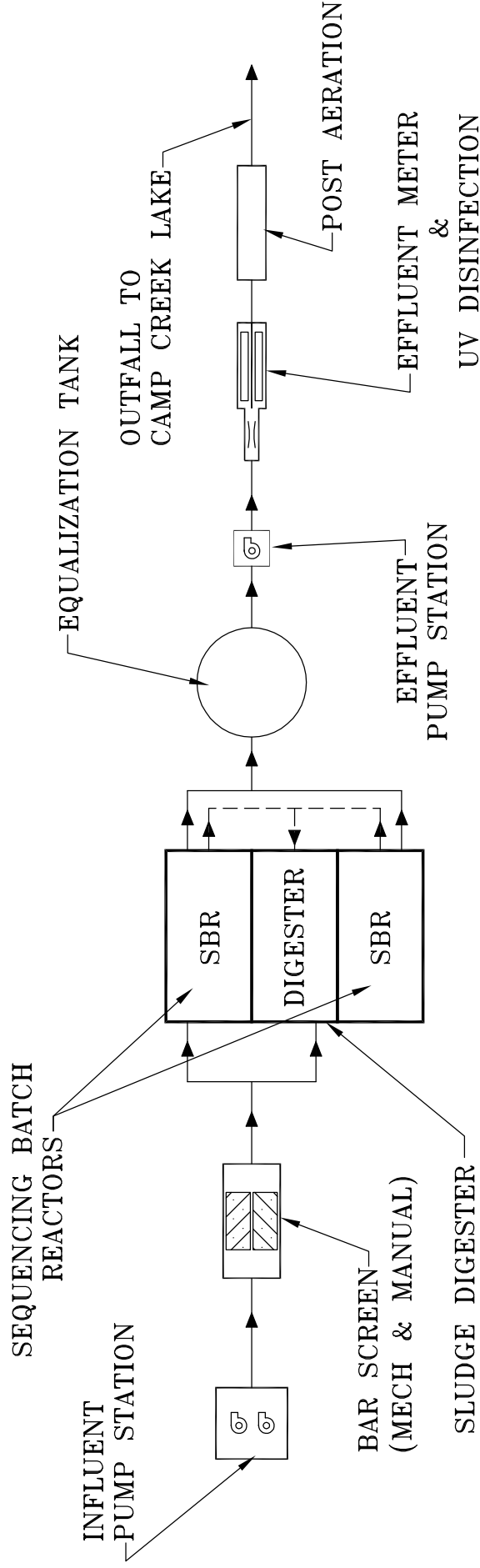
See attached.

VII. PRECIPITANTS INFORMATION

See attached.

VIII. LOUISA COUNTY WATER AUTHORITY STANDARD TERMS AND CONDITIONS

See Appendix A. The Louisa County Water Authority does not accept changes to the Louisa County Water Authority Standard Terms and Conditions, and any attempt by the Offeror to make such changes is in itself reason for a proposal to be declared as non-responsive to the RFP and rejected by the Water Authority.



ZION CROSSROADS WWTP
EXISTING PLANT
SCHEMATIC
(0.1 MGD)



Dewberry
Dewberry & Davis, Inc.

4180 Innslake Drive
Glen Allen, Virginia 23060
Phone: 804.290.7957
Fax: 804.290.7928

DATE

08/2007

TITLE

EXISTING FACILITIES
LINE DIAGRAM

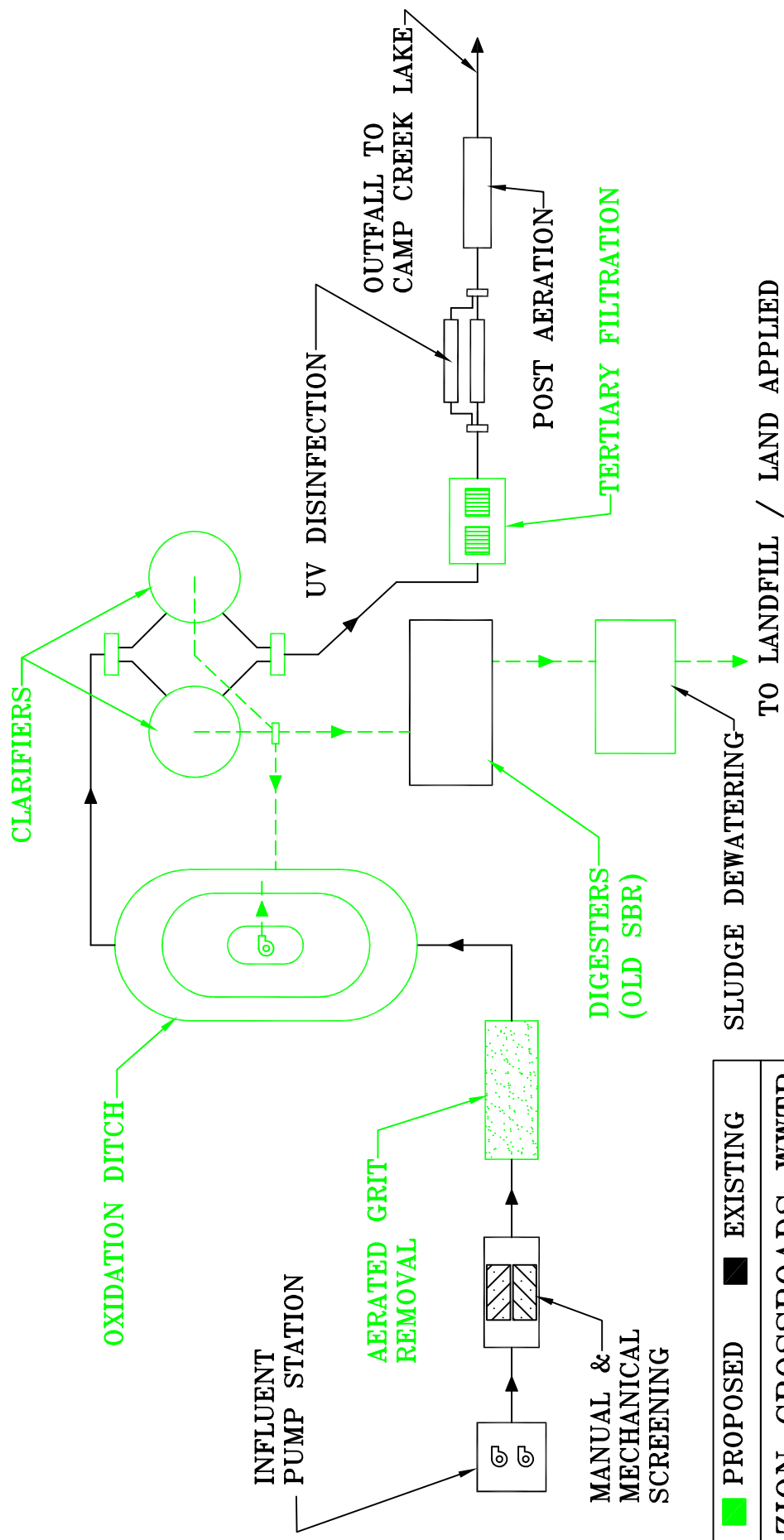
PROJECT

ZION CROSSROADS WWTP
PER UPDATE

SHEET NO.

FIG.

2.6



PROPOSED

EXISTING

ZION CROSSROADS WWTP

EXPANSION SCHEMATIC

(0.7 MGD)

 Dewberry Dewberry & Davis, Inc. 4180 Innslake Drive Glen Allen, Virginia 23060 Phone: 804.290.7957 Fax: 804.290.7928	DATE	TITLE	SHEET NO.	
	08/2007	PROJECT	PROPOSED FACILITIES LINE DIAGRAM - OX. DITCH OPTION	FIG. 3.4
ZION CROSSROADS WWTP PER UPDATE				



TECHNICAL REPORT

DATE: May 9, 2011

SUBJECT: Copper and Zinc Removal for Zion Crossroads and Louisa WWTPs

AUTHOR: Stan Barto

DISTRIBUTION: Paul Anthony

1.0 SUMMARY AND BACKGROUND INFORMATION

At the request of Dewberry, testing of wastewater samples from Zion Crossroads WWTP and Louisa WWTP was conducted in order to identify an effective treatment program for removing zinc and copper from these wastewaters. Specifically, Zion wastewater was tested for copper and zinc removal with the objective being to remove zinc to levels below their limit of 50ppb and copper to levels below their limit of 5.7ppb. Louisa wastewater was tested for zinc removal with the objective being to remove zinc to levels below their limit of 100ppb.

In both cases, a treatment program consisting of Thio-Red precipitant and ACS 2000 coagulant was found to be very effective for removal of target metals in the clarification process. With regard to Louisa, 25ppm ThioRed and 35ppm ACS 2000 was effective in removing zinc to 43ppb. With regard to Zion Crossroads, 35ppm ThioRed and 35ppm ACS 2000 was effective in removing zinc to 32ppb and copper to 4.3ppb. Application of Thio-Red followed by direct filtration achieved even higher removal efficiencies at reduced dosages, but on-site trial work would be necessary to determine if this application method would be viable on plant.

It is recommended that ThioRed be trialed at both plants to demonstrate its effectiveness. ACS 2000 can be used to replace the alum currently being used for coagulation and phosphorus removal. Use of ACS 2000 would reduce or eliminate the use of soda ash from the process while reducing total P levels to <1ppm. Regardless of the coagulant that is used, it is recommended that ThioRed be added before secondary clarification at a rate of 25-30ppm. Filtration can serve as a polishing step if needed.

2.0 EXPERIMENTAL RESULTS AND OBSERVATIONS

Various treatment programs were evaluated by standard jar testing using 0.5L samples. With each chemical addition, mixing was carried out at 100rpm for 2 minutes. Final mixing was carried out 20rpm for 5 minutes. Treated samples were allowed to settle for 15 minutes. Supernatant samples were collected by decanting from the treated beaker into a test bottle. Metals analyses were conducted using ICP Spectroscopy. When noted, filtration of supernatant was performed using a Millipore syringe pre-filter (10 micron pore size).

Samples received for evaluation along with characteristics of each are summarized below in Table 1.

TABLE 1: Sample Characteristics

Parameter	Zion Influent	Zion Effluent	Louisa Influent	Louisa Effluent
pH	6.8	7.7	6.9	7.3
Copper (ppb)	102	14	ND	ND
Zinc (ppb)	362	167	148	118

A summary of treatment programs evaluated and the results obtained from each on the wastewater from Zion Crossroads is presented below in Table 2.

TABLE 2: Results Obtained from Testing of Zion Crossroads Wastewater

Treatment	pH	Copper (ppb)	Zinc (ppb)
Metals Limits		5.7	50
125ppm alum	6.2	58	118
125ppm alum + filtration	6.2	56	109
125ppm alum + 20ppm Thio-Red	6.3	11	56
125ppm alum + 35ppm Thio-Red	6.3	5.3	39
35ppm ACS 2000	6.8	46	97
35ppm ACS 2000 + filtration	6.8	40	91
35ppm ACS 2000 + 20ppm Thio-Red	6.8	9.4	46
35ppm ACS 2000 + 35ppm Thio-Red	6.9	4.3	32
20ppm Thio-Red + filtration	6.8	12	53
35ppm Thio-Red + filtration	6.9	4.7	36
20ppm Thio-Red added to effluent + filtration	7.7	3.2	23

NOTE: alum and ACS 2000 was added to achieve a total phosphorus of <1ppm. This dose was then held constant for the evaluation of metals removal.

As shown by the obtained results, coagulant alone was not capable of removing copper and zinc to levels within permit limits. Slightly better removal efficiencies were consistently seen from use of ACS 2000 as compared to alum. This however is likely due to higher pH (less suppression) of the samples when using ACS 2000. Thio-Red was capable of removing both copper and zinc to acceptable levels. Greater efficiency was achieved when used in conjunction with a coagulant for TSS removal.

A summary of treatment programs evaluated and the results obtained from each on the wastewater from Zion Crossroads is presented below in Table 3.

TABLE 3: Results Obtained from Testing of Louisa Wastewater

Treatment	pH	Zinc (ppb)
Metals Limits		100
125ppm alum	6.4	128
125ppm alum + filtration	6.5	125
125ppm alum + 15ppm Thio-Red	6.5	120
125ppm alum + 20ppm Thio-Red	6.4	101
125ppm alum + 25ppm Thio-Red	6.5	52
35ppm ACS 2000	6.8	123
35ppm ACS 2000 + filtration	6.9	109
35ppm ACS 2000 + 15ppm Thio-Red	6.9	111
35ppm ACS 2000 + 20ppm Thio-Red	6.9	87
35ppm ACS 2000 + 25ppm Thio-Red	6.9	43
20ppm Thio-Red + filtration	6.9	99
25ppm Thio-Red + filtration	6.9	47
15ppm Thio-Red added to effluent + filtration	7.3	28

NOTE: alum and ACS 2000 was added to achieve a total phosphorus of <1ppm. This dose was then held constant for the evaluation of metals removal.

As shown by the obtained results, coagulant alone was not capable of removing zinc to 100ppb or less. Slightly better removal efficiencies were consistently seen from use of ACS 2000 as compared to alum. This however is likely due to higher pH (less suppression) of the samples when using ACS 2000. Soda ash was not used in testing to raise pH back to 7. Thio-Red was consistently capable of removing zinc to acceptable levels whether coagulant was used or not.

3.0 DISCUSSION AND RECOMMENDATIONS

Thio-Red was found to be effective at both locations for the removal of copper and zinc as needed. It was effective when applied to the influent or the effluent. Results indicate that the biological process aids in rendering the metals more easily removable since better removal efficiencies were observed from testing of the effluent sample as compared to testing (pre-SBR) influent samples. Thio-Red can therefore be applied to either the secondary clarifiers or to the effluent filtration portion of the process. If applied to the filtration portion, reaction time and backwash frequency would need to be investigated further through an on-site extended trial.

Thio-Red is a polythiocarbonate based metal precipitant used extensively for the removal of heavy metals to very low levels. It works by reacting with chelated or unchelated, dissolved metal cations to form a very stable, highly insoluble metal trithiocarbonate. Metal trithiocarbonates are removed from the treatment process in the solids and will not re-dissolve into the process at any point. Once in the solids, they remain stable and therefore cause no

problems with TCLP testing. While polythiocarbonate is non-toxic and safe for use in wastewater treatment systems, any residual which may be present in the effluent is destroyed during disinfection forming sulfate and carbon dioxide. Acute aquatic toxicity results are readily available.

It is recommended that ThioRed be trialed at both plants to demonstrate its effectiveness. ACS 2000 can be used to replace the alum currently being used for coagulation and phosphorus removal. Use of ACS 2000 would reduce or eliminate the use of soda ash from the process while reducing total P levels to <1ppm. Regardless of the coagulant that is used, it is recommended that ThioRed be added before secondary clarification at a rate of 25-30ppm. Filtration can serve as a polishing step if needed.

MATERIAL SAFETY DATA SHEET

DATE OF ISSUE: 03/27/2000

DATE OF LATEST REVISION: 09/08/2006

PAGE 1 OF 3

SECTION 1: PRODUCT and COMPANY IDENTIFICATION

PRODUCT NAME: THIO-RED

PRIMARY FUNCTION: METAL PRECIPITANT

CHEMICAL NAME: Hydropolysulfide, carbonothioylbis-,disodium salt. CAS# 128578-22-3

CHEMICAL FAMILY: Organic Sulfur

MANUFACTURER:

WATER SPECIALISTS TECHNOLOGIES LLC

1515 KASTNER PLACE

SANFORD, FL 32771 USA

PHONE: 407-321-7910 FAX: 407-321-3098

EMERGENCY 24/7 CONTACT:

CHEMTREC - PHONE: 1- 800-424-9300

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	(CAS #)	OSHA PEL (PPM)	ACGIH TLV (PPM)	OTHER
------------	---------	-------------------	--------------------	-------

The components of this formulation and the precise composition is proprietary. Bona fide requests for disclosure to medical personnel must be made in accordance with the procedures in 29 CFR 1910.1200(i)1-13.

While this material is not classified as hazardous under OSHA regulations, this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available to all users of this product.

SECTION 3: HAZARDS IDENTIFICATION

EYES: May cause irritation and redness.

SKIN: Prolonged contact with skin may cause skin irritation.

INGESTION: See Section 4 below.

INHALATION: Mist or spray may cause irritation if inhaled.

SECTION 4: FIRST AID MEASURES

EYES: Flush eyes gently with water for at least 15 minutes while holding eyelids apart. Seek medical attention.

SKIN: Remove contaminated clothing and shoes and flush affected area with water for at least 15 minutes. Wash with soap and water. If irritation persists seek medical attention. Wash or discard contaminated clothing and shoes

INGESTION: Immediately rinse mouth with water. Do not induce vomiting. Drink milk or water to dilute. If vomiting occurs, drink more liquids. Seek medical attention

INHALATION: If respiratory distress occurs, get into fresh air and, if needed, administer oxygen and start CPR. Seek medical attention.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: Not Applicable – water solution.

EXTINGUISHING MEDIA: Not Applicable – water solution

SPECIAL FIRE FIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION 6: ACCIDENTAL RELEASE MEASURES

SMALL SPILLS: Soak up with an absorbent and shovel into a waste container.

LARGE SPILLS: Contain spill and recover liquid for reprocessing or disposal

WASTE DISPOSAL METHOD: Dispose of in accordance with local, state and federal regulations.

SECTION 7: HANDLING and STORAGE

HANDLING AND STORAGE: Protect drum from damage, freezing and intense heat.

OTHER PRECAUTIONS: Wear protective eye goggles, gloves, boots and clothing.

SECTION 8: EXPOSURE CONTROLS and PERSONAL PROTECTION

EYE PROTECTION: Wear chemical splash-proof goggles

PROTECTIVE GLOVES: Wear alkaline resistant gloves.

RESPIRATORY PROTECTION: None normally required.

VENTILATION: Always store and use all chemicals in well ventilated areas.

OTHER PROTECTIVE EQUIPMENT: Wear protective clothing and boots suitable for protection from alkaline products. Provide eye wash and safety shower stations.

SECTION 9: PHYSICAL and CHEMICAL PROPERTIES

BOILING POINT: 212°F

SPECIFIC GRAVITY: 1.04 – 1.06

EVAPORATION RATE: Not Determined

VAPOR DENSITY: Not Determined

VAPOR PRESSURE: Not Determined

SOLUBILITY IN WATER: Complete

pH of NEAT SOLUTION: 12.0 – <12.5

APPEARANCE/ODOR: Warm Red Liquid, Sulfur Odor

SECTION 10: STABILITY and REACTIVITY

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents or mineral acids.

HAZARDOUS DECOMPOSITION PRODUCTS: None Known

SECTION 11: TOXICOLOGICAL INFORMATION

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None noted.

SPECIAL NOTE: None of the components in this product are considered a carcinogen by OSHA, NTP or IARC.

TOXICITY TESTS resulted in the following LC₅₀ values after 48-hour static acute toxicity tests: Rainbow Trout @ 33.0 mg/l; Bluegill Sunfish @ 35.0 mg/l.

SECTION 12: ECOLOGICAL INFORMATION

No data.

SECTION 13: DISPOSAL CONSIDERATIONS

This product, in its neat form, is not considered hazardous. After use in treating wastewaters/groundwaters, the characteristics of the treated solution will dictate the proper disposal in accordance with local, state and Federal regulations.

SECTION 14: TRANSPORT INFORMATION

Non-regulated material.

SECTION 15: REGULATORY INFORMATION

FEDERAL EPA

Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA):

Requires notification to the National Response Center of releases of quantities of Hazardous Substances equal to or greater than the reportable quantities (RQ) in 40 CFR 302.4. Components present in this product at a level which would require reporting under the statute are:

<u>Chemical</u>	<u>CAS Number</u>	<u>RQ</u>
NONE		

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III:

Requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQ) in 40 CFR 355 (SARA 302, 304, 311 and 312) Components present in this product at a level which could require reporting under the statute are: NONE

Toxic Substances Control Act (TSCA) Status:

All components of this product are on the TSCA inventory

EPA Priority Pollutants: NONE

RCRA Hazard Class: If discarded neat - non-hazardous.

SECTION 16: OTHER INFORMATION

HMIS RATINGS: Health=1, Flammability=0, Reactivity=0

HMIS HAZARD INDEX: 0=MINIMAL, 1=SLIGHT, 2=MODERATE, 3=SERIOUS, 4=SEVERE

LEGEND:

CAS Chemical Abstract Number
CERCLA Comprehensive Environmental Response, Compensation and Liability Act
CFR Code of Federal Regulations
HMIS Hazardous Materials Identification System
IARC International Agency for Research on Cancer
MSDS Material Safety Data Sheet
N/A Not Applicable
NTP National Toxicity Program
OSHA Occupational Safety and Health Administration
PEL Permissible Exposure Limit
SARA Superfund Amendments and Reauthorization Act
TSCA Toxic Substance Control Act
TLV Threshold Limit Value

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.



April 27, 2011

Mr. Dean Rodgers, General Manager
Louisa County Water Authority
P.O. Box 160
Louisa, VA 23093

Subject: Benchscale Study Analysis of Zinc Removal for LCWA at Louisa
 Regional WWTP

Dear Mr. Rodgers,

ESS completed the Benchscale Study at the Louisa Regional WWTP on March 15, 2011.
Please see the attached evaluation report of the Study.

Should you have any questions or concerns please feel free to contact me at 540-825-6660.

Best regards,

A handwritten signature in black ink, appearing to read "CJ Hoehna", with a long horizontal line extending to the right.

Cody J. Hoehna, Operations Manager
Environmental Services Division

LOUISA COUNTY WATER AUTHORITY REGIONAL SEWAGE TREATMENT PLANT

ZINC EVALUATION PRELIMINARY REPORT

April 27, 2011

Introduction:

Louisa Regional Sewage Treatment has experienced problems meeting their zinc water quality standard of 100 ug/L. ESS performed additional benchscale analysis in the Fall of 2010 by manipulating the pH of each individual sample and performing metals analysis. This initial study proved to be inconclusive at the time and thus additional benchscale analysis was recommended using various chemical precipitants. ESS was contracted again in early 2011 to perform a bench study evaluation to determine the effectiveness of chemical addition to reduce zinc concentrations in the final effluent. This second evaluation was performed on March 15, 2011.

Methodology:

The bench study focused on treatment of secondary effluent collected from clarifier discharge. Several 1L aliquots of wastewater were inoculated with various concentrations of chemical coagulants. Two coagulants were selected based on their potential for zinc precipitation. Sodium Aluminate and DelPac XG, a proprietary product manufactured by Delta Chemical containing Aluminum Chlorohydrate as the primary active ingredient, were both evaluated. A series of jar tests were performed using four separate aliquots of sample. Each aliquot was dosed with various concentrations of each chemical at different pH levels. Results of these analyses are presented in the attached table. Also attached is a bar graph showing removal capabilities for DelPac XG. As can be seen from the table, minimal precipitation occurred using Sodium Aluminate. On the other hand, samples receiving Aluminum Chlorohydrate (DelPac XG) revealed zinc concentration reduction ranging from 16 – 25% with an average percent removal of 20%.

Conclusions:

From this initial study it appears that only Aluminum Chlorohydrate was able to offer any kind of reduction to the zinc concentration of the plant effluent. Sodium Aluminate offered little to no reduction of Zinc, thus this chemical should not be considered in this particular application. Aluminum Chlorohydrate use during the benchscale study was able to reduce Zinc concentration levels below the required permit limit of 100 ug/L, however the pre-inoculation level of Zinc (control sample) was already well below the permit limit by over half, 42.6 ug/L and 41.5 ug/L respectively. The study was able to achieve approximately 20% removal on average at the specific level. Thus the percentage of removal may vary depending on level of Zinc prior to treatment.

For example, if Zinc levels within the water prior to treatment were over 100 ug/L, adding the precipitant may or may not be able to achieve 20% reduction. The only way to accurately confirm Zinc reductions at various levels would be to continue monitoring and perform a full scale pilot analysis. It must be noted that actual removal efficiency at full scale operation within the plant may vary from the bench study results.

Should LCWA evaluate the feasibility of this option and choose to pursue the next step in the zinc removal evaluation, the next step will be to set up a full scale pilot study and evaluate the usage of this chemical precipitant for a period of time under actual plant conditions. According to the chemical supplier, Aluminum Chlorohydrate is currently selling for \$0.50/pound; however discounts may be negotiated with the manufacturer if purchased in bulk quantity. Aluminum Chlorohydrate weighs approximately 11.1 lbs/gallon, thus this chemical will cost approximately \$305.00 per 55 gallon drum in addition to tax and any other applicable delivery fees. A pilot study will have to be performed prior to estimating actual projected usage in order to accurately determine an estimated cost of implementing this product beyond pilot study status.

Should you have any questions please feel free to contact me at 540-825-6660.

Best regards,



Cody J. Hoehna, Operations Manager
Environmental Services Division

Attachment 1 – Sampling Data & Charts
Attachment 2 – Laboratory Analytical Report
Attachment 3 – Chemical Precipitant Information

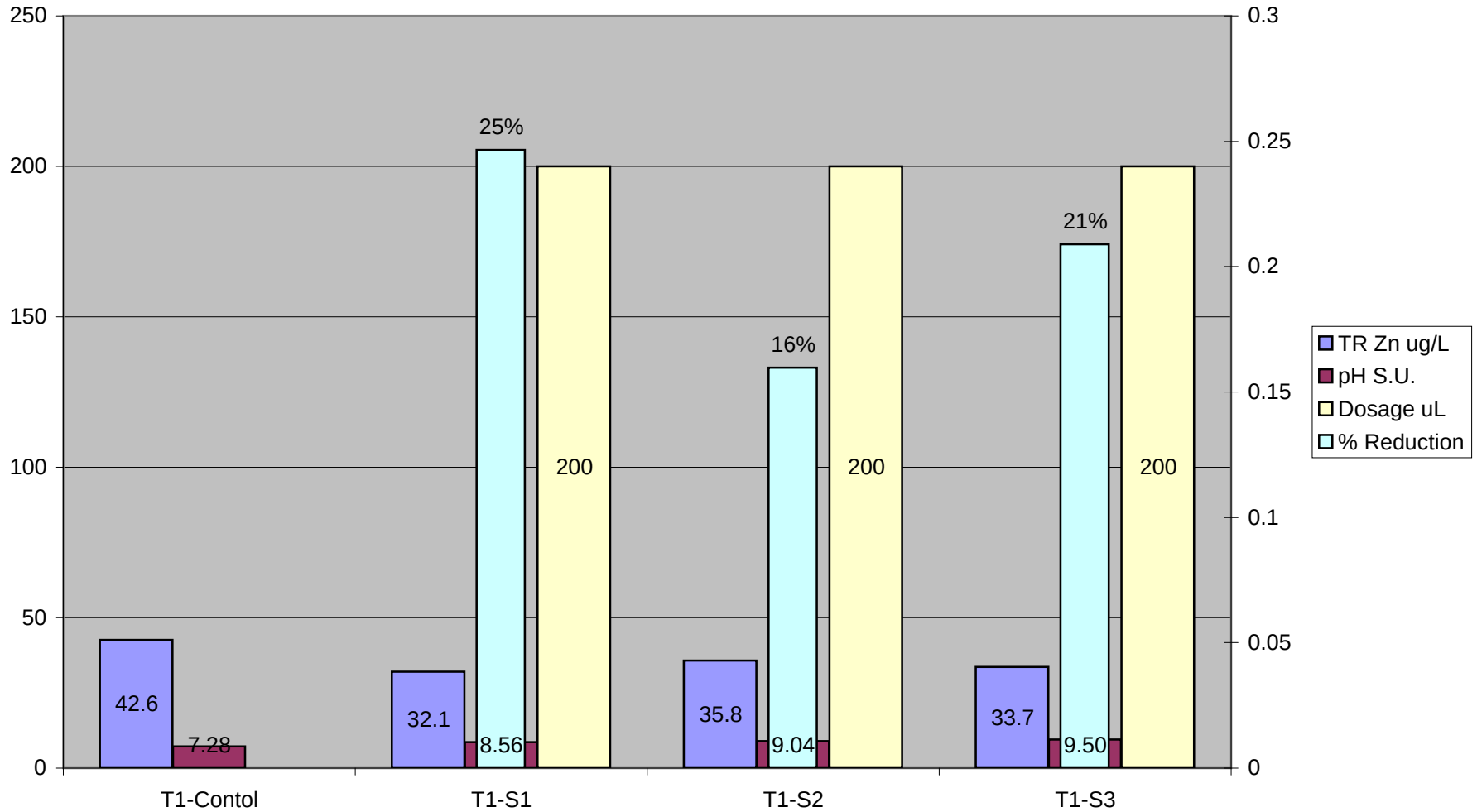
ATTACHMENT 1

**Louisa County Water Authority
Louisa Regional WWTP
Zinc Benchscale Study**

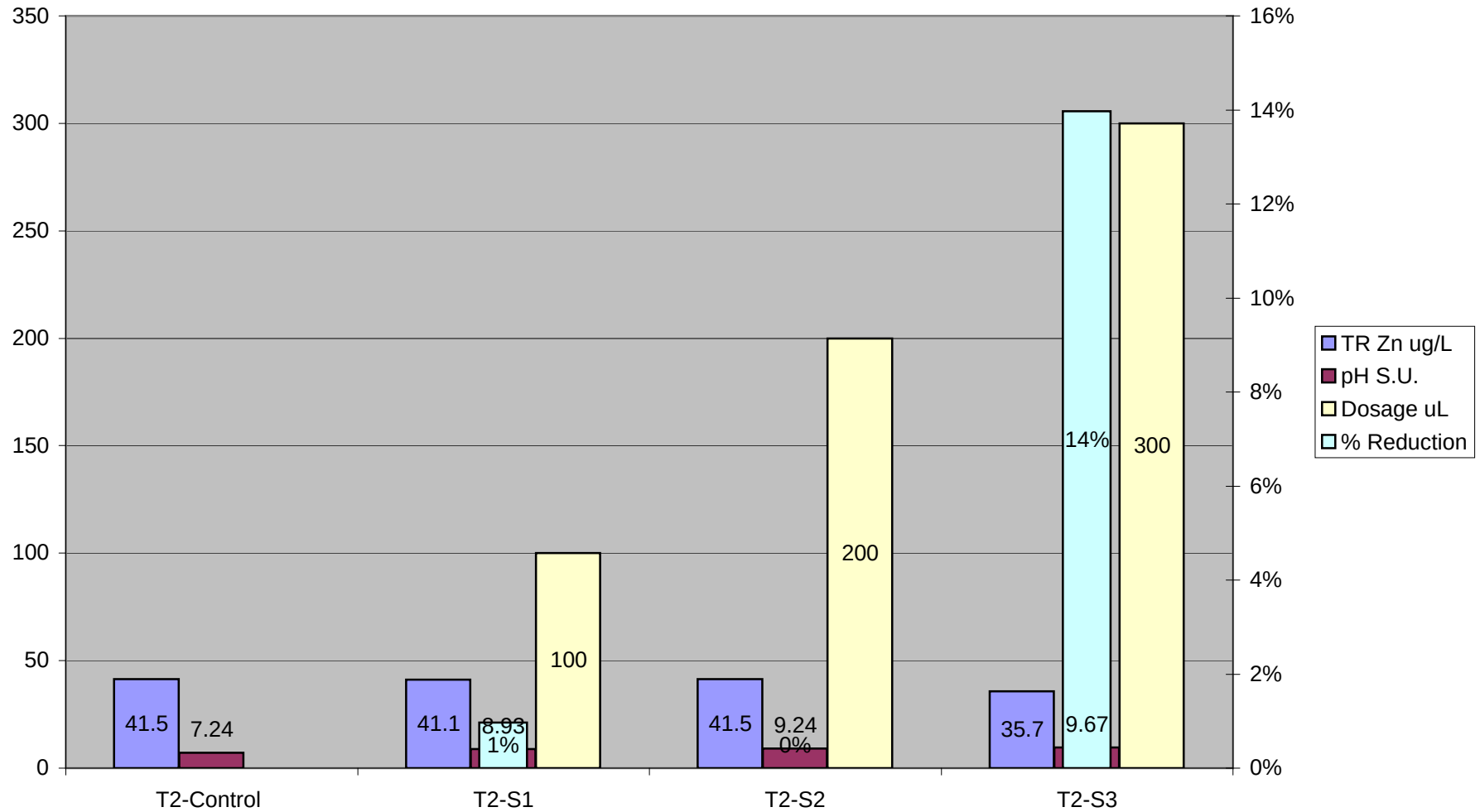
Sample Date 3/15/2011

Sample Point	Sample Description	Pre-Inoculation		Dosage uL	Post-Inoculation		TR Zn mg/L	TR Zn ug/L	% Reduction
		pH S.U.	Temp C		pH S.U.	Temp C			
<i>T1-Control</i>	<i>Al ClH</i>	<i>7.28</i>	<i>11.8</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>0.0426</i>	<i>42.6</i>	<i>n/a</i>
T1-S1	Al ClH	7.26	11.9	200	8.56	12.7	0.0321	32.1	25%
T1-S2	Al ClH	7.26	11.8	200	9.04	12.8	0.0358	35.8	16%
T1-S3	Al ClH	7.29	11.7	200	9.50	12.8	0.0337	33.7	21%
<i>T2-Control</i>	<i>NaAl</i>	<i>7.24</i>	<i>14.3</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>0.0415</i>	<i>41.5</i>	<i>n/a</i>
T2-S1	NaAl	7.21	14.2	100	8.93	14.3	0.0411	41.1	1%
T2-S2	NaAl	7.23	14.2	200	9.24	14.4	0.042	41.5	0%
T2-S3	NaAl	7.23	14.2	300	9.67	14.5	0.036	35.7	14%

LCWA Louisa Regional WWTP Benchscale Study
3/15/2011
Aluminum Chlorohydrate (DeLPAC XG)



LCWA Louisa Regional WWTP Benchscale Study
3/15/2011
Sodium Aluminate



ATTACHMENT 2



ENVIRONMENTAL SYSTEMS SERVICE, LTD.

LOUISA COUNTY WATER AUTHORITY
P. O. BOX 9
LOUISA, VA 23093

Page: 1
Work Order #: 15509
Contract #:
Customer #: 7011
Customer PO #: PRECIPITATION STUDY-ZINC
Job Location: REGIONAL-BENCHSCALE STUDY
Collected by: CODY HOEHNA
Date Received: 03/15/2011

ANALYSIS REPORT

TAG #: SAMPLE POINT: SAMPLE DATE:
46299 T1 - CONTROL 03/15/2011

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
Zinc, Total Recoverable*	0.0426	mg/l	0.0100	EPA 200.8	04/04/11	11:13	HB

TAG #: SAMPLE POINT: SAMPLE DATE:
46300 T1 - S1 03/15/2011

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
Zinc, Total Recoverable*	0.0321	mg/l	0.0100	EPA 200.8	04/04/11	11:13	HB

TAG #: SAMPLE POINT: SAMPLE DATE:
46301 T1 - S2 03/15/2011

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
Zinc, Total Recoverable*	0.0358	mg/l	0.0100	EPA 200.8	04/04/11	11:13	HB

TAG #: SAMPLE POINT: SAMPLE DATE:

Reviewed by:

Angie Woodward
A. Woodward/Technical Director

Report Date: April 05, 2011
VA LAB ID# 460019

* Subcontracted test



ENVIRONMENTAL SYSTEMS SERVICE, LTD.

Page: 2

LOUISA COUNTY WATER AUTHORITY
P. O. BOX 9
LOUISA, VA 23093

Work Order #: 15509
Contract #:
Customer #: 7011
Customer PO #: PRECIPITATION STUDY-ZINC
Job Location: REGIONAL-BENCHSCALE STUDY
Collected by: CODY HOEHNA
Date Received: 03/15/2011

ANALYSIS REPORT

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
46302 T1 - S3					03/15/2011		

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
Zinc, Total Recoverable*	0.0337	mg/l	0.0100	EPA 200.8	04/04/11	11:13	HB

TAG #: 46303
SAMPLE POINT: T2 - CONTROL

SAMPLE DATE:
03/15/2011

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
Zinc, Total Recoverable*	0.0415	mg/l	0.0100	EPA 200.8	04/04/11	11:13	HB

TAG #: 46304
SAMPLE POINT: T2 - S1

SAMPLE DATE:
03/15/2011

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
Zinc, Total Recoverable*	0.0411	mg/l	0.0100	EPA 200.8	04/04/11	11:13	HB

TAG #: 46305
SAMPLE POINT: T2 - S2

SAMPLE DATE:
03/15/2011

Reviewed by:

Angie Woodward
A. Woodward/Technical Director

Report Date:
VA LAB ID#

April 05, 2011
460019

* Subcontracted test



ENVIRONMENTAL SYSTEMS SERVICE, LTD.

LOUISA COUNTY WATER AUTHORITY
P. O. BOX 9
LOUISA, VA 23093

Page: 3

Work Order #: 15509
Contract #:
Customer #: 7011
Customer PO #: PRECIPITATION STUDY-ZINC

Job Location: REGIONAL-BENCHSCALE STUDY
Collected by: CODY HOEHNA
Date Received: 03/15/2011

ANALYSIS REPORT

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
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Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
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Zinc, Total Recoverable*	0.0415	mg/l	0.0100	EPA 200.8	04/04/11	11:13	HB
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TAG #: 46306
SAMPLE POINT: T2 - S3

SAMPLE DATE:
03/15/2011

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
-------------	--------	------	------------	--------	------------	------	------

Zinc, Total Recoverable*	0.0357	mg/l	0.0100	EPA 200.8	04/04/11	11:13	HB
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Reviewed by:

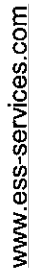
Angie Woodward
A. Woodward/Technical Director

Report Date: April 05, 2011
VA LAB ID# 460019

* Subcontracted test

ENVIRONMENTAL SYSTEMS SERVICE, LTD.

500 Stone St.
Post Office Box 736
Bedford, VA 24523
540-586-5413
Fax 540-586-5530



Sampled By: Cody Hoehna (Print Name) [Signature] (Signature)

[illegible]

Relinquished by: 	Date 3/15/11	Time 1633	Received by:		Relinquished by:		Date	Time	Received by:	
Relinquished by: 	Date	Time	Received by:		Relinquished by:		Date	Time	Received by:	
Method of Delivery:			☐ UPS ☐ UPS Overnight ☒ Hand Delivery ☐ Post Office			On Ice? ☐ Y ☒ N Received @ 11.4 c ☐ Under 2 hours			TAT: Normal _____ Rush _____ Need Results by _____ Extra charges will apply for Rush TAT.	
						W.O.# <u>15767</u> Amt Paid \$ _____			Check # _____	

ATTACHMENT 3



DelPAC XG

(Aluminum Chlorohydrate Solution)

PRODUCT DATA SHEET

% Aluminum Oxide	23.5 ± 0.5
% Aluminum	12.5 ± 0.3
Basicity	83.3% ± 0.8%
Chloride	8.2 ± 0.6%
pH	3.3 ± 0.3
Specific Gravity (60 ⁰ F)	1.33 ± 0.02
Turbidity(NTU)	< 50
Color	Light grey to water-white
Appearance	Slightly hazy to clear
Freezing Point	22 ⁰ F
CAS Number	12042-91-0 (Aluminum Chlorohydrate)

DelPAC XG is certified under ANSI/NSF Standard 60
DelPAC XG meets AWWA Standard B408-10

The information provided in this data sheet has been obtained from sources believed to be reliable. However, no warranty is given either expressed or implied. User is responsible for the applicability of product to their use.

Rev. 1.2011

2601 Cannery Avenue
Baltimore, Maryland 21226-1595

TEL (410) 354-0100 FAX (410) 354-1021



**38% LIQUID SODIUM ALUMINATE
TYPICAL ANALYSIS**

CHEMICAL

Al ₂ O ₃ %	20.0
Total Na ₂ O %	18.4
Fe %	0.0030
Na ₂ O/Al ₂ O ₃ Mole Ratio	1.51

PHYSICAL

Color	Amber
Viscosity	14,000 cp @ 0°F 2,000 cp @ 20°F 280 cp @ 40°F
Specific Gravity	1.45 @ 100°F

AVAILABILITY

Shipping Point	Baltimore, Maryland
Packing	4,000 Gallon Tank Trucks

QUALITY

This product meets the specifications of American Water Works Association Standard B405-06 and is also certified by NSF as meeting Standard 60.

07/07



Material Safety Data Sheet

Section I General Information

Trade Name: JENFITCH JC 1687

Chemical Name & Synonyms: N/A Multi component System

Chemical Family: polyaluminum chloride

Formula: Proprietary

Address:

JENFITCH, LLC.

P.O. BOX 30123

Walnut Creek, CA 94598

800-644-3518

925-305-7880

Charles Jennings

Date: APRIL 2009

Section II First Aid Measures

Emergency Phone Numbers 800-644-3518

Eyes: Flush immediately with water, continuing for at least 15 minutes. If irritation persists, get medical attention

Skin: Flush with plenty of water, removing contaminated clothing. If irritation develops, get medical attention

Inhalation: Promptly remove to fresh air

Ingestion: If conscious, immediately give large quantity of water or milk. DO NOT INDUCE VOMITING . Get medical assistance

Section III Hazards Information

Health

Inhalation: If mist is formed, it will irritate mucous membranes and respiratory tract

Ingestion: Can cause irritation of the mouth and gastrointestinal tract

Skin: Contact may cause severe reddening and swelling

Eyes: May strongly irritate or burn eyes

Permissible Concentration: Air (See Section X)

ACGIH/TLV: 2 mg (Al)/M³

OSHA/PEL: None established

Biological: No data available

Unusual Chronic Toxicity: No known chronic toxicity

Fire and Explosion

Flash Point: not flammable

Auto Ignition: n/a

Flammable Limits in Air (% by Volume):n/a

Unusual Fire and Explosion Hazards: Hydrogen chloride vapors may form at elevated temperatures

Section IV Precautions/Procedures

Fire Extinguishing Agents Recommended: n/a

Fire Extinguishing Agents to Avoid: n/a

Special Fire fighting Precautions: Wear self-contained breathing apparatus approved by NIOSH. Use water spray to keep containers cool

Ventilation: Local exhaust if misty condition prevails

Normal Handling: Avoid contact with skin, eyes, or clothing. Avoid inhalation of mist or fumes

Storage: Store in plastic or rubber-lined containers. Store in a cool place

Spill or Leak: Dike area to contain spill. Neutralize spilled material with alkali such as soda ash. When using carbonates for neutralization, adequate precautions should be taken to minimize hazards from CO₂ gas

Special: Precautions? Procedures/Label Instructions: Bulk shipment tag signal word:

Warning: Causes irritation to eyes and skin. Harmful if swallowed. Wash thoroughly after handling.

Section V Personal Protective Equipment

Respiratory Protection: Where required, use a respirator approved by NIOSH for mists.

Eyes and Face: Wear hard hat (or other head covering) and chemical safety goggles. Do not wear contact lenses

Hands, Arms and Body: Wear impervious gloves and apron and full work clothing, including long sleeve shirt, trousers and boots Completely impervious clothes should be substituted if there is prolonged or repeated contact. Launder contaminated clothing before reuse

Other Clothing and Equipment: Eye-wash and quick-drench shower facilities

Section VI Physical Data

Material is (at normal condition) Liquid

Appearance and odor: amber/clear colored liquid, negligible odor

Boiling Point Approx. 112.5°C

Melting Point: Approx -10°C

Specific Gravity (H₂O=1) 1.28-1.29

Vapor Density (Air=1) not applicable

Vapor Pressure: not applicable

pH: 4.0-6.0 (neat)

Solubility in Water (% by weight) 100 %

Evaporation Rate: n/a

% Volatile by volume (at 20°C) : 48.5%

Section VII Reactivity Data

Stability: Stable

Condition to Avoid: high temperature

Incompatibility (Materials to Avoid) Metals such as iron or steel which are subject to corrosion

Hazardous Decomposition Products: at elevated temperatures, HCL vapor may be generated

Hazardous Polymerization: will not occur

Conditions to Avoid: n/a

Section VIII Hazardous Ingredients

<u>Material or Component/ C.A.S. #</u>	<u>Hazard Data (See Sect X)</u>
Polyaluminum hydroxchloride/ CAS 12042-91-0	non hazardous, non regulated
Polyquaternary amine/26062-79-3	non hazardous, non regulated

Section IX Environmental

Degradability/Aquatic Toxicity: no data available

Octanol/Water Partition Coefficient: no data available

EPA Hazardous Substance (Clean Water Act Section 311) No

If so reportable Quantity: 40 CFR 116-117

Waste Disposal Methods (Disposer Must Comply with Federal, State, and Local Disposal or Discharge Laws

Treatment or disposal of waste generated by use of this product should be reviewed in terms of applicable federal, state, and local laws and regulations.

User are advised to consult with appropriate regulatory agencies before discharging, treatment or disposing of this material.

RCRA STATUS OF UNUSED MATERIAL:NONE

Section X References

PERMISSIBLE CONCENTRATION REFERENCES: TLV:ACGIH 1986-7 list

“Threshold limit values for chemical substances.....”

Regulatory Standards

Sittig, M. “Handbook of Toxic and Hazardous Chemicals and Carcinogens” 2nd Ed. 1985

ACGIH: “Documentation of TLV’s 4th Ed. 1980

THIS PRODUCT SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION.

JENFITCH, LLC. PROVIDES NO WARRANTIES, EITHER EXPRESSED OR IMPLIED, AND ASSUMED NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THIS DATA CONTAINED HEREIN

**JENFITCH, LLC**

P.O. Box 30123
Walnut Creek, CA 94598
Phone: 925-289-3559
Fax: 925-289-0094

PRODUCT BULLETIN**JC 1687****Characteristics**

JC 1687 is a clear to amber colored liquid. It is an advanced cationic coagulant and flocculant suitable for industrial and potable water treatment and paper machine application.

Typical Properties

Formula: Aqueous solution of polyaluminum hydroxchloride and organic coagulant agent
CAS: 1327-41-9 (polyaluminum hydroxchloride)

pH (neat)	4.0-4.6
Specific Gravity @ 70°F	1.28-1.30
Freezing Point, °F	10 (Approx)
Density, lbs/gal	10.68-10.84
Aluminum as Al, %	9.0-9.4
Aluminum as Al ₂ O ₃ , %	18.0-19.5
Basicity, %	73-83

Product Uses

Municipal and industrial water and wastewater treatment for the removal of turbidity, color, suspended solids and phosphorus. Sludge compaction and volume reduction. Lagoon treatment. Oily wastewater clarification and dissolved air flotation. Emulsion breaking

Shipping Container

bulk transport	275 gallon tote
55 gallon plastic drum	Bulk car

Shipping Regulations

DOT Classification: Corrosive liquid, n.o.s.
(Contains polyaluminum hydroxchloride)

Material of Construction

Plastic lined steel tanks, fibreglass tank or corrosion resistant plastic are preferred materials of construction. Black iron, mild steel, zinc, aluminum, and magnesium are not recommended. PVC pump heads and feed lines are recommended

Product Safety Information

JC 1687S requires care in handling. Anyone procuring, using or disposing of these products or their containers must be familiar with the appropriate safety and handling precautions. Such information may be found in the Material Safety Data Sheets for this product or you may contact **JENFITCH**. In the event of an emergency with this product, call the emergency 24 hour JENFITCH's Hotline 800-644-3518. For additional information contact:

JENFITCH, LLC
P.O. Box 30123
Walnut Creek, CA 94598
Phone 925-289-3559
Fax 925-289-0094
Email: sales@jenfitch.com

All statements, information and data given herein are believed to be accurate and reliable but are presented without guaranty, warranty, or responsibility of any kind, expressed or implied. Statements or suggestions concerning the possible uses of our products are made without representation or warranty that any such use is free of patent infringement, and we are not recommending to infringe any patents. The user should not assume that all safety measures are indicated or that other measure may not be required.



JENFITCH, LLC

Material Safety Data Sheet

Section I: GENERAL INFORMATION

Trade Name: JENFITCH JC 9830

Chemical Name of Primary Component(s): divalent metal sulfide and surfactant

Chemical Family: divalent metal sulfide

Formula: Proprietary

Address:

JENFITCH, LLC

P.O. BOX 30123

Walnut Creek, CA 94598

925-289-3559

800-644-3518

Charles Jennings

Date: January 2010

Section II: INGREDIENTS

<u>COMPONENT NAME:</u>	<u>CAS Number</u>	<u>OSHA HAZARD(H)/ NON-HAZARD(NH)</u>	<u>Weight %</u>
Calcium Polysulfide	1344-81-6	H	29.0%
Inerts			71.0%

Section III: HAZARDS IDENTIFICATION

**PRECAUTIONARY STATEMENTS: DANGER: MAY BE FATAL IF SWALLOWED: CORROSIVE TO SKIN:
CAUSES IRREVERSIBLE EYE DAMAGE AND SKIN BURNS**

		<u>NFPA</u>	<u>HMIS</u>
National Fire Protection	Health	2	2
Association Rating	Fire	0	0
	Reactivity	0	0
Hazardous Materials	4=extreme/severe	3=high/serious	
Identification System	2=moderate	1=slight	0=minimum

Sara Title III Hazard	Immediate (acute) health	YES
Classification	Delayed (chronic) health	NO
	Fire	NO
	Sudden release of pressure	NO
	Reactive	YES

Section IV: EMERGENCY AND FIRST AID PROCEDURES

Remove the patient from immediate source of exposure and assure that the individual is breathing. If not breathing, use artificial respiration. GET MEDICAL ATTENTION

Swallowing: Drink promptly a large quantity of milk, egg white, or gelatin solution or if these are not available, large quantities of water. Get medical attention. Do not induce vomiting. (See Note to Physician below).

Skin: Wash all affected areas with plenty of soap and water while under a safety shower

for at least 15 minutes, while removing contaminated clothing and shoes. Do not attempt to neutralizing with chemicals agents. Seek medical attention immediately. Discard any contaminated clothing and shoes.

Inhalation: Remove victim to fresh air. If not breathing, administer cardiopulmonary resuscitation or artificial respiration. If breathing is difficult or irritation develops, GET MEDICAL ATTENTION.

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes using an eyewash fountain, if available. Lift upper and lower lids and rinse under them with copious amounts of water. GET MEDICAL ATTENTION

NOTES TO PHYSICIAN:

PROBABLE MUCOSAL DAMAGE MAY CONTRAINDICATE GASTRIC LAVAGE. FOR SEVERE HYDROGEN SULFIDE POISONING, SUCCESSFUL TREATMENT HAS INVOLVED INITIAL INHALATION OF AMYL NITRITE PEARLS FOR 15 TO 30 SECONDS OF EACH MINUTE UNTIL 10 MLS OF A 3% SOLUTION OF SODIUM NITRITE CAN BE ADMINISTERED INTRAVENOUSLY AT 2.5 TO 5 MLS PER MINUTE. THE NITRATE-INDUCED METHEMOGLOBIN IS THOUGHT TO BIND THE TOXIC HYDRO-SULFIDE ION.

Section V: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Degrees C/F): n/d

FLAMMABLE LIMITS IN AIR: N/D

AUTOIGNITION TEMPERATURE: N/D

EXTINGUISHING MEDIA: CO₂ DRY CHEMICAL FOAM, WATER SPRAY

Special Fire Fighting Procedures: Smoke from the fires may present unusual hazards, avoid breathing smoke. Avoid contact with fall out and runoff. Minimize amount of water used for fire fighting. Do not enter any enclosed areas without full protective equipment, including self-contained breathing equipment. Contain and isolate runoff and debris for proper disposal. Prevent unauthorized entry to fire area. Read entire bulletin.

Persons who have been exposed to contaminated smoke should be immediately relieved from duty and checked for symptoms of poisoning. These should not be mistaken for heat exhaustion or smoke inhalation. See Section IV and XI, Health Hazard Data for symptoms of poisoning, first aid procedures and notes to physician.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep fire exposed containers cool with water spray.

Section VI: ACCIDENTAL RELEASE MEASURES

Follow the spill procedures on the container. DO NOT USE ACIDIC CLEANING MATERIALS. Cover spill with generous amount of absorbent such as clay or loam soil. Use a stiff broom to mix thoroughly. Sweep up and place in a disposable container. Scrub contaminated area with detergent soap and water using a stiff broom. Pick up liquid with more absorbent and place in disposable container.

Section VII HANDLING AND STORAGE

Do not heat drums with any welding equipment as explosion may occur. Avoid breathing gas. Do not get in eyes, or skin or on clothing. Store in a cool, dry place in properly designed vessels.

VIII EXPOSURE CONTROLS/PERSONAL PROTECTION

PROTECTIVE EQUIPMENT SHOULD BE USED DURING THE FOLLOWING PROCEDURES:

- Manufacture or formulation of this product
- Repair and maintenance of contaminated equipment
- Clean up of leaks and spills
- Any other activity that may result in hazardous exposures

RESPIRATORY PROTECTION

Use NIOSH/MSHA approved full-face respirator with H₂S gas cartridge. Use positive pressure self-contained breathing apparatus for emergency or other conditions requiring a higher level of protection.

VENTILATION

Use local exhaust as needed to maintain airborne exposure below exposure limits.

PROTECTIVE CLOTHING:

Full-body protective clothing, chemical-resistant gloves and boots.

EYE PROTECTION:

Chemical Workers's Goggles and full-face shield.

OTHER PROTECTIVE EQUIPMENT

Maintain a sink, safety shower and eyewash fountain in the work area. Have oxygen readily available

Section IX PHYSICAL DATA

Boiling Point:	Not determined	Percent Active:	29.0± 0.1
Vapor Pressure	N/A	pH (100% solution):	11.5-11.8
Vapor Density	N/A	V.O.C.%	0
Specific Gravity:	1.27±0.01	Evaporation Rate:	N/A
Appearance:	Deep orange-red clear solution	Odor:	pungent odor of rotten eggs
Solubility in H ₂ O:	Complete		

Section X STABILITY AND REACTIVITY

Stability: Stable to boiling point, will lose water above this temperature
Conditions to Avoid: Elevated temperatures can cause containers to burst.
Materials to Avoid: Avoid contact with acids. Hydrogen Sulfide gas will be generated, dangerous to inhale, explosive at critical concentration.

Hazardous Decomposition Products: Normal combustion products are carbon dioxide and water vapor. Decomposition may also produce oxides of sulfur. Incomplete combustion or thermal decomposition can produce carbon monoxide, oxyhydrocarbon derivatives and sulfur derivatives including hydrogen sulfide

Hazardous Polymerization: None

XI. TOXICOLOGICAL INFORMATION

Chemical Name(s)	<u>ACGIH (TLV)</u>	<u>OSHA (TWA)</u>
Calcium Polysulfide	None	None

TOXICOLOGY DATA:

Oral LD ₅₀	(M) 820 mg/kg (F) 820 mg/kg
Dermal LD ₅₀ (rabbit)	>2000 mg/kg
Inhalation LC ₅₀ (rat-4 hr exposure)	(M) 3.9 mg/l (F) 3.1 mg/l
Skin effects (rabbit):	Mildly irritating
Eye effects (rabbit):	Irreversible damage due to high pH

AQUATIC TOXICITY:

Toxicity to fish:	LC ₅₀ /Fathead minnow/96 hr- 154 mg/kg (OECD 203)
	LC ₅₀ /Bluegill/96 hrs- 190 mg/kg (OECD 203)
	LC ₅₀ /Rainbow Trout/96hr- 30 mg/kg (OECD 203)
Toxicity to daphnia:	LC ₅₀ /Daphnia Pulex/48 hrs- 55 mg/kg(OECD 202)
Toxicity to algae:	LC ₅₀ /Selenastrum Capricornutum/5days- 60mg/kg (OECD 201)

CARCINOGENICITY: None determined

EFFECTS OF AN ACUTE EXPOSURE:

Swallowing: This material decomposes in the digestive tract to release sulfur and hydrogen sulfide (H₂S). Signs and symptom of toxicity may included headache, nausea, vomiting drowsiness, amnesia, tremors, depressed respiration, convulsions, cyanosis and death due to respiratory paralysis. Severe irritation of the digestive tract may also occur.

Inhalation: Symptoms are those of hydrogen sulfide (H₂S). Inhalation of H₂S is irritating to the respiratory tract. If respiratory irritation or any signs or symptoms described in this bulletin occur, move the person to fresh air. If these effects continue, see a Medical Doctor Immediately.

Skin Contact: Chemically burned skin as from calcium hydroxide (lye), may produce systemic toxicity by skin absorption.

Eye Contact: Chemically burned eye tissue as from calcium hydroxide (lye), may produce severe membrane irritation with corneal damage.

EFFECTS OF CHRONIC EXPOSURE: None Known

EXISTING MEDICAL CONDITIONS POSSIBLY AGGRAVATED BY EXPOSURE:

Skin irritation may be aggravated in individuals with existing skin lesions. Breathing of H₂S gas may aggravate acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis.

XII. DISPOSAL CONSIDERATIONS

Contaminated cleanup materials may be hazardous. Refer to Sections IV and VIII of this MSDS sheet before handling. All contaminated materials should be placed in disposable containers and buried in an approved dumping area. Follow all local rules governing waste disposal in your area.

XIII. TRANSPORT INFORMATION

Transportation Status: DOT: Not Regulated

Proper shipping name: n/a

Hazard Class: n/a

ID#: NOS\

Packing Group: n/a

National Motor Freight Classification (NMFC): 102180

XIV REGULATORY INFORMATION

TSCA Inventory Status: This product is listed on TSCA Inventory

SARA Title III

Section 313 Toxic Chemicals: Not Listed

RCRA Hazardous Waste: Not Listed

XV. OTHER INFORMATION

THIS PRODUCT SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION.

JENFITCH PROVIDES NO WARRANTIES, EITHER EXPRESSED OR IMPLIED, AND ASSUMED NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THIS DATA CONTAINED HEREIN

**JENFITCH, LLC**

P.O. Box 30123
Walnut Creek, CA 94598
Phone: 925-289-3559
Fax: 925-289-0094

PRODUCT BULLETIN**JC 9830****Characteristics**

JC 9830 is a deep orange-red clear solution. It is an advanced metal precipitant used for low level metal removal. It contains no hazardous components.

Typical Properties

Formula: Aqueous solution of inorganic and organic surfactants and divalent metal polysulfide
CAS No. 1344-81-6

pH (neat)	11.3-11.5
Specific Gravity @ 70°F	1.273
Freezing Point, °F	23 (Approx.)
Density, lbs./gal	10.59
Viscosity:	20 cps

Product Uses

JC 9830 uses include precipitation of heavy metals from plating, circuit board and other liquid waste streams and cyanide conversion and destruction. Used for ground water remediation for heavy metals and soil remediation at manufacturing sites, mine areas and similar locations. It is used in excavate and treat and in situ processes for fixation/stabilization projection.

Applications

Municipal Wastewater Treatment Plant- JC 9830 can be fed into the aeration basis or mixed liquor to convert dissolved copper into insoluble copper to achieve less than 1.0 ppb in the discharge effluent.

Plating and Circuit Board Fabricators- JC 9830 in conjunction with a coagulant and/or flocculant can effectively remove heavy metal to less than 0.1 ppm.

Shipping Containers

5 gal pail (50 lbs net)
55 gal drums (580 lbs net)
275 gallon tote (2900 lbs net)

Shipping Regulations

DOT Classification: non hazardous, non corrosive

Material of Construction

Plastic lined steel tanks, fiberglass tank or corrosion resistant plastic are preferred materials of construction.

Product Safety Information

JC 9830 requires care in handling. Anyone procuring, using or disposing of these products or their containers must be familiar with the appropriate safety and handling precautions. Such information may be found in the Material Safety Data Sheets for this product or you may contact **JENFITCH**. In the event of an emergency with this product, call the emergency 24 hour **JENFITCH'S Hotline 800-644-3518**. For additional information contact:

JENFITCH, LLC
P.O. Box 30123
Walnut Creek, CA 94598
Phone (925) 289-3559
(800) 644-3518
Fax (925) 289-0094

All statements, information and data given herein are believed to be accurate and reliable but are presented without guaranty, warranty, or responsibility of any kind, expressed or implied. Statements or suggestions concerning the possible uses of our products are made without representation or warranty that any such use is free of patent infringement, and we are not recommending to infringe any patents. The user should not assume that all safety measures are indicated or that other measure may not be required.

APPENDIX A
LOUISA COUNTY WATER AUTHORITY
STANDARD TERMS AND CONDITIONS

1. General Provisions

- 1.1 Unless otherwise agreed to in a writing signed by the General Manager of the Louisa County Water Authority, these Standard Terms and Conditions apply to and govern all purchases, regardless of the type of goods or services purchased, by the Louisa County Water Authority (the “Authority”) from _____ (the “Vendor”).

2. Definitions

- 2.1 “Solicitation” means the vehicle by which the Authority solicited pricing, and if applicable other terms, by which it could acquire goods or services from Vendor, regardless of whether the vehicle was an Invitation for Bid, Request for Proposal, Request for Quote, telephone quote or any other means permissible under the Louisa County Code or Virginia law.
- 2.2 “Contract Documents” means all documents that constitute any legal and binding agreement between the Vendor and the Authority, including these Standard Terms and Conditions.
- 2.3 “Contract Period” means the time period from the time that Vendor first becomes legally bound to provide goods or services to the Authority in response to a Solicitation until all of Vendor’s contractual obligations to the Authority, arising out the Solicitation, cease.
- 2.4 “Obligations” means any and all legal obligations of Vendor under any Contract Documents.

3. Laws of the Commonwealth

- 3.1 The Contract Documents shall be governed in all respects whether as to validity, construction, performance, or otherwise by the laws of the Commonwealth of Virginia and the Louisa County Code. Vendor represents and warrants to the Authority that during the Contract Period it:
- a) Will comply and conform with the provisions of the Civil Rights Act of 1964, as amended, the Virginia Fair Employment Contracting Act of 1975, as amended, and the Virginia Human Rights Act, as amended, where applicable;
 - b) Not employ illegal alien workers or otherwise violate the provisions of the Immigration Reform and Control Act of 1986; and

- c) Comply with all federal, state and local laws and regulations applicable to the performance of the services procured.

4. Louisa County Policies

4.1 In every contract of over \$10,000, the Vendor agrees during the Contract Period that Vendor:

- a) Will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the Vendor; and
- b) Will post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause; and
- c) Will state that the Vendor is an equal opportunity employer in all solicitations or advertisements for employees placed by or on behalf of the Vendor to perform under the Contract Documents. All notices, advertisements, and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section; and
- d) Will include the provisions of the foregoing subparagraphs in every subcontract or purchase order exceeding \$10,000 issued by Vendor in order to fulfill its Obligations, so that the provisions will be binding upon each subcontractor or vendor employed by Vendor.

4.2 In every contract of over \$10,000, the Vendor agrees during the Contract Period the Vendor shall:

- a) Provide a drug-free workplace for its employees;
- b) Post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in its workplace and specify the actions which will be taken against any employee for a violation;
- c) State in all of its solicitations or advertisements for employees that the Vendor maintains a drug-free workplace; and

- d) Include the provisions of this sub-paragraph in every subcontract or purchase order of over \$10,000, so that said provisions shall be binding upon each subcontractor or subvendor.
- e) For purposes of this sub-paragraph, "drug-free workplace" means a site for the performance of work done in connection with a specific contract awarded to a Vendor under a Solicitation and in accordance with the Virginia Public Procurement Act and/or the Louisa County Code.
- f) In addition to the provisions contained herein, the Vendor shall comply with the federal Drug Free Workplace Act.

4.3 Pursuant to Section 2.2-4343.1 of the Code of Virginia and Section 60-25 of the Louisa County Code, in all Solicitations, contracts, and purchase orders, the Authority does not discriminate against faith-based organizations.

- a) "Faith-based Organization" means a religious organization that is or applies to be a Vendor to provide goods or services for programs funded by the block grant provided pursuant to the Personal Responsibility and Work Opportunity Reconciliation Act of 1996, P.L. 104-193.
- b) If Vendor is a faith-based organization, then Vendor shall give to each individual who applies for or receives goods, services, or disbursements provided pursuant to this Agreement the following notice in bold-face type:

NOTICE

Neither the Authority's selection of a charitable or faith-based provider of services nor the expenditure of funds under this contract is an endorsement of the provider's charitable or religious character, practices, or expression. No provider of services may discriminate against you on the basis of religion, a religious belief, or your refusal to actively participate in a religious practice. If you object to a particular provider because of its religious character, you may request assignment to a different provider. If you believe that your rights have been violated, please discuss the complaint with your provider or notify the appropriate person as indicated in this form.

5. Certifications

5.1 The Vendor certifies that Vendor's response to the Solicitation:

- a) Has been prepared without prior participation, understanding, agreement, or connection with any corporation, firm or other person that is also submitting a bid/offer in response to the same Solicitation;
 - b) Is in all respects fair, without misrepresentations of fact, and free from collusion or fraud;
 - c) Is in full compliance with the Virginia Conflicts of Interest Act;
 - d) Is or is intended to be competitive and free from any collusion with any person, firm or corporation; and
 - e) Has been prepared without the benefit of being provided information not available to the general public, or other potential bidders, such as insider information known to Authority employees or other sources which may have gained such information from interaction with Authority employees.
- 5.2 The Vendor has not offered or received any kickback from any other bidder or vendor, supplier, manufacturer, or subcontractor in connection with the bid/offer on this solicitation. A kickback is defined as an inducement for the award of a contract, subcontracts or order, in the form of any payment, loan, subscription, advance, deposit of money, services or anything, present or promised, unless consideration of substantially equal or greater value is exchanged. Further, no person shall demand or receive any payment, loan, subscription, advance, and deposit of money, services or anything of value in return for an agreement not to compete on a public contract;
- 5.3 The Vendor is not a party to nor has he participated in nor is obligated or otherwise bound by agreement, arrangement or other understanding with any person, firm or corporation relating to the exchange of information concerning bids, prices, terms or conditions upon which the contract resulting from the acceptance of his bid proposal is to be performed;
- 5.4 The Vendor understands that collusive bidding is a violation of the Virginia Governmental Frauds Act and federal Law, and can result in fines, prison sentences, and civil damage awards and agrees to abide by all conditions of this proposal; and
- 5.5 Neither Vendor, Vendor's subcontractors, nor any person acting on Vendor's behalf, have conferred, or will confer, on any public employee having official responsibility for a procurement transaction any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value is exchanged.

6. Warranties

- 6.1 The Vendor represents and warrants that it has the requisite experience, skills, capabilities, and manpower to perform the Obligations in a good and workmanlike fashion, that it is a legal business entity chartered or authorized to do business in Virginia having all necessary licenses required by law, that the person signing any of the Contract Documents has been fully authorized to do so, and his signature will legally bind the Vendor to perform its Obligations. Any goods or services furnished by the Vendor under the Contract Documents shall be covered by the most favorable warranties provided by the Vendor to any customer, but in no event shall such warranty be less than one (1) year from date of completion of services or sale of goods, as applicable.
- 6.2 Vendor warrants to the Authority that all materials and equipment furnished shall be new, unless otherwise specified, and that Vendor's Work shall be of good quality, free from faults and defects and in strict conformance with the Contract Documents. All materials and work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. This warranty shall be in addition to, and not in limitation of, any other warranty or remedy required by law or by the Contract Documents.
- 6.3 The Vendor agrees that if warranties set forth in the Contract Documents are in any respect breached, the Vendor will pay to the Authority the full contract price agreed to by the Authority to be paid for the supplies, materials, equipment or services furnished under the bid or proposal. These rights and remedies are in addition to and do not limit those rights and remedies otherwise available to the Authority.

7. Modifications, Additions or Changes

- 7.1 Modifications, additions or changes to these terms and conditions may not be made except in writing and agreed to by the Authority. No fixed priced contract may be increased by more than twenty-five (25) percent of the amount of the contract or \$50,000, whichever is greater, without the approval of the Authority. The amount of any contract may not be increased for any purpose without adequate consideration provided to the Authority.

8. Procurement Code

- 8.1 Solicitations are subject to Chapter 60 of the Louisa County Code and any revisions, thereto, which are hereby incorporated into this contract in their entirety. **ANY SOLICITATION OR CONTRACT DOCUMENTS THAT**

LOUISA COUNTY CODE OR VIRGINIA LAW ARE VOID AB INTIO, AND ARE OF NO EFFECT, REGARDLESS OF WHETHER ANY PURCHASE HAS BEEN MADE UNDER THE CONTRACT DOCUMENTS AND IRRESPECTIVE OF THE AMOUNT OR LENGTH OF VENDOR'S PERFORMANCE UNDER THE CONTRACT DOCUMENTS. A current copy of the Louisa County Code is available at www.municode.com or for viewing at the Louisa County administration building during normal business hours.

9. Bid Acceptance Period

- 9.1 Any bid in response to a Solicitation shall be valid for 60 days. At the end of the 60 days, the bid may be withdrawn at the written request of the bidder. If the bid is not withdrawn at that time, it remains in effect until an award is made or the Solicitation is cancelled.

10. Indemnification

- 10.1 The Vendor agrees to indemnify, defend and hold harmless the Authority and its officers, agents, and employees from any claims, damages and actions of any kind or nature, whether at law or in equity, arising from or caused by (i) the use of any materials, goods, or equipment of any kind or nature furnished by the Vendor; (ii) any services of any kind or nature provided by the Vendor; or (iii) Vendor's performance of its Obligations, provided that such liability is not attributable to the sole negligence on the part of the Authority.

11. Assignment

- 11.1 Neither the Obligations nor the Contract Documents may be assigned, sublet, or transferred, in whole or in part, without the written consent of the Authority.

12. Audit

- 12.1 The Vendor hereby agrees to retain all books, records, and other documents relative to Vendor's Obligations and the Contract Documents for five (5) years after final payment or after all other pending matters are closed, whichever is longer. The Authority and its authorized agents, auditors, the grantor of the funds to the Authority, the Comptroller of Virginia or of the United States, or any of their duly authorized representatives shall have access to any such books, documents, papers and records of the Vendor for the purpose of making audits, examinations, excerpts or transcriptions.

13. Ownership of Documents

- 13.1 Any reports, studies, photographs, negatives, or other documents prepared by Vendor in the performance of its Obligations shall be remitted to the Authority by the Vendor, without demand therefore, upon the earliest of (i) completion of its Obligations; (ii) completion of the Contract Period; or (iii) termination, cancellation or expiration of the Contract Documents. Vendor shall not use, willingly allow or cause to have such materials used for any purpose other than performance of the Obligations without the prior written consent of the Authority. The Authority shall own the intellectual property rights to all materials produced under this Agreement.

14. Payment and Performance Bond

- 14.1 If Vendor's Obligations include construction, the amount of which exceeds \$100,000, the Vendor shall furnish to the Authority the bonds required under Section 60-21 of the Louisa County Code and shall otherwise fully comply with the requirements of such sections of the Code. The Authority reserves the right to require payment and/or performance bonds in the amount of the Obligations for any other projects, goods or services, whether or not required by such sections of the Code.

15. Required Payment

- 15.1 The Vendor covenants and agrees to:
- a) Within seven (7) days after receipt of any amounts paid to the Vendor under the Agreement,
 - b) pay any subcontractor for its proportionate share of the total payment received from the Authority attributable to the work under the Agreement performed by such subcontractor, or
 - c) notify the Authority and the subcontractor, in writing, of its intention to withhold all or a part of the subcontractor's payment and the reason therefore.
- 15.2 Vendor agrees to provide its federal employer identification number or social security number, as applicable, as a condition precedent to the Authority being required to make any payment to the Vendor under the Contract Documents.
- 15.3. Vendor agrees to pay interest at the legal rate or such other rate as may be agreed to in writing by the subcontractor and the Vendor on all amounts owed by the Vendor that remain unpaid after seven (7) days following receipt by the Vendor of payment from the Authority for work performed by the subcontractor in furtherance of Vendor meeting its Obligations to the Authority, except for amounts withheld pursuant to subparagraph 15.1(c) above.

- 15.4 Vendor agrees to include in its contracts with any and all subcontractors the requirements of 15.1(a), 15.1(b), and 15.1(c) above.

16. Liability Coverage

- 16.1 Unless otherwise expressly excepted in the Solicitation documents prepared by the Authority, the Vendor shall take out and maintain during the Contract Period such bodily injury, liability and property damage liability insurance as shall protect it and the Authority from claims for damages for personal injury, including death, as well as from claims for property damage, which could arise from Vendor's performance of its Obligations. Such insurance shall at least have the coverages and be in the amounts set forth in section 19 "Insurance and Bond Requirements" set forth below and shall name the "Board of Supervisors of Louisa County, Virginia" and the "Louisa County Water Authority" as additional insureds. Such insurance must be issued by a company admitted to do business within the Commonwealth of Virginia and with at least an AM Best rating of A-. Within 10 days after Vendor is awarded a contract in response to a Solicitation, and in no event later than the first day on which Vendor provides goods or services to the Authority, the Vendor shall provide the Authority with a certificate of insurance showing such insurance to be in force and providing that the insurer shall give the Authority at least 30 days' notice prior to cancellation or other termination of such insurance.

17. Loss or Damage in Transit

- 17.1 Delivery by a Vendor to a common carrier does not constitute delivery to the Authority. Any claim for loss or damage incurred during delivery shall be between the Vendor and the carrier. The Authority accepts title only when goods are received regardless of the F.O.B. point noted in the Solicitation or the Contract Documents. The receiving agency will note all apparent damages in transit on the freight bill and notify the Vendor. Discovery of concealed damages or loss will be reported by the receiving agency to the carrier and the Vendor within 15 days of receipt and prior to removal from the point of delivery if possible. The Vendor shall make immediate replacement of the damaged or lost merchandise or be in default of the Contract Documents. It shall be the Vendor's responsibility to file a claim against the carrier. If damage is to a small quantity, with the approval of the agency, the Vendor may deduct the amount of damage or loss from his or her invoice to the agency in lieu of replacement.

18. Freight

- 18.1 By signing any response to a Solicitation the bidder certifies that the bid price(s) offered for F.O.B. destination include only the actual freight charges at the lowest and best rate and is based upon the actual weight of the goods to

be shipped. Freight charges are, therefore, established for each individual purchase. If a requirement is bid F.O.B. origin, the Vendor shall prepay the charges and add the amount to the invoice. A copy of the freight bill should be attached to all invoices that include freight charges. In a solicitation specifying F.O.B. origin the Authority will consider freight cost in the evaluation of bids.

19. Insurance and Bond Requirements

19.1 The Vendor shall maintain the following insurance to protect it from claims that could arise from performance of the Obligations, including claims (i) under the Workmen's Compensation Act; (ii) for personal injury, including death; and (iii) for damage to property, regardless of whether such claims arise out of Vendor's actions or inactions, or those of Vendor's subcontractor or other persons directly or indirectly employed by either of them:

- a) Worker's Compensation and Employer's Liability. Vendor shall procure and maintain Worker's Compensation and Employer's Liability Insurance covering all of its employees in conformance with the laws of any state, district or territory of the United States of America in which work towards meeting Vendor's Obligations are to be performed. Such insurance shall not have a limit of liability less than the following:
 - a) Bodily Injury by accident, \$500,000 for each accident;
 - b) Bodily Injury by disease, \$500,000 policy limit;
 - c) Bodily Injury by disease, \$500,000 for each employee.
- b) Commercial General Liability Insurance. This coverage shall include contractual liability, underground hazard, explosion and collapse, hazard, property damage, independent Vendor, and personal injury insurance in support of section 10 of this Agreement entitled "Indemnification". This policy shall be endorsed to include the Authority as additional insured's during the Contract Period and shall state that this insurance is primary insurance as regards any other insurance carried by the Authority. Vendor shall procure and maintain Public Liability Insurance in an amount not less than:
 - a) \$1,000,000 for each occurrence involving bodily injury;
 - b) \$1,000,000 for each occurrence involving property damage;
 - c) \$2,000,000 aggregate limits.
- c) Comprehensive Automobile Liability. Vendor shall procure and maintain Comprehensive Automobile Liability Insurance covering all automobiles, trucks, tractors, trailers, or other automobile equipment, whether owned, not owned, or hired by the Vendor, with the following limits:
 - a) \$1,000,000 for each occurrence involving personal injury;

- b) \$1,000,000 for each occurrence involving property damage;
- c) \$2,000,000 aggregate limits.

d) The Vendor shall purchase and maintain insurance coverage in a sufficient amount to cover all potential claims on his tools, equipment and machinery.

19.2 The Authority reserves the right to require insurance of any Vendor in greater amounts provided notice of such requirements is stated in the solicitation.

19.3 All insurance policies required under this paragraph, or otherwise required by the Solicitation or Contract Documents, shall include a clause waiving any and all subrogation rights against the Authority.

19.4 Insurance policies shall provide for notification to the Authority of non-payment of any premium and shall give the Authority the right to make the premium payment thereunder within a reasonable time, if the insurance policy is in danger of lapsing during the Contract Period. Any premium payments made by the Authority shall be deducted from amounts due Vendor under the Contract.

20. Compliance With Laws

20.1 All work performed shall be in accordance with all local, state and federal codes, laws and regulations, including but not limited to: Virginia Conflict of Interest Act, Virginia Fair Employment Contracting Act, Virginia Freedom of Information Act, Virginia Prompt Payment Act, the Virginia Public Procurement Act, and the Louisa County Code.

21. No Waiver

21.1 Any failure of the Authority to demand rigid adherence to one or more of the terms of the Contract Documents, on one or more occasions, shall not be construed as a waiver nor deprive the Authority of the right to insist upon strict compliance with the terms of the Contract Documents. Moreover, it is the Authority's position and Vendor hereby agrees that the legal theories of Implied Waiver, Statute of Limitation, Estoppel, and Laches do not apply as defenses that the Vendor may assert in any action by the Authority. Any waiver of a term of this Agreement, in whole or in part, must be in writing and signed by the party granting the waiver to be effective.

22. Termination and Cancellation

22.1 The Authority shall have the unilateral right to terminate any contract with Vendor for default on the terms of that contract, or any other contract between the Vendor and the Authority.

- 22.2 The Authority has the unilateral right to cancel and terminate any contract with Vendor, in whole or in part, without penalty, merely out of convenience, and shall require no breach of contract by Vendor as a condition of termination. This right of termination for convenience may be exercised at the sole unconditional discretion of the Authority. If a contract is terminated in whole or in part for the convenience of the Authority, the Vendor shall be paid the contracted price for the service or goods actually provided or rendered up to the date of the termination of the respective contract, but shall not be paid any other fees or lost profits.
- 22.3 Any contract cancellation notice shall not relieve the Vendor of the obligation to perform on all outstanding orders issued prior to the effective date of cancellation.

23. Availability of Funds

- 23.1 It is understood and agreed between the parties herein that the Authority shall be bound hereunder only to the extent of the funds available and duly appropriated or which may hereafter become available and duly appropriated for the purpose of fulfilling the Authority's obligations with respect to the Contract Documents.

24. Billing, Method of Payment and Offset Rights

- 24.1 Billing shall be done monthly based on the contracted rate bid by the Vendor and submitted to the Louisa County Administration Department. The Authority will remit payment within 30 days of receipt of a correct invoice. Incorrect invoices shall be subject to correction and/or rejection by the Louisa County Administration Department.
- 24.2 Vendor agrees that the Authority has the unilateral right to offset any bill submitted to Authority by Vendor, or any payment owed to Vendor by the Authority, by any amount due to the Authority from Vendor pursuant to the Contract Documents, or any other agreement, contract or transaction between Authority and Vendor.

25. Tax Exemption

- 25.1 The Louisa County Water Authority, as a political subdivision of the Commonwealth of Virginia, is exempt from any Federal excise tax and Virginia sales and use tax under VA Code §15.2-5132. The Louisa County Water Authority's tax identification number is 54-1190434.

26. Work Site Damages

- 26.1 Any damages, including damage to finished surfaces, resulting from Vendor's performance of its Obligations shall be repaired to the satisfaction of the Authority at the Vendor's expense.

27. Choice of Law

- 27.1 To ensure uniformity of the enforcement of the Contract Documents, and irrespective of the fact that either of the parties now is, or may become, a resident of a different state, this Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Virginia and of Louisa County without regard to their principles of conflicts of law.

28. Forum Selection

- 28.1 Vendor agrees, and submits, to sole and exclusive jurisdiction and venue in the General District or Circuit Courts of Louisa County, Virginia for resolution of any and all claims, causes of action or disputes between Vendor and the Authority. The Vendor agrees hereby to waive any jurisdictional or venue defenses related to any such action brought in the courts of Louisa County, and further agrees to not remove or file any such action in Federal Court.
- 28.2 Vendor agrees that service by registered mail to the address set forth in Paragraph 31.1 of these Standard Terms and Conditions shall constitute sufficient service of process for any such action.

29. Severability

- 29.1 If any provision of any one, or all of the Contract Documents is held to be illegal, invalid, or unenforceable, or is found to be against public policy for any reason, such provision shall be fully severable and the remainder of the Contract Documents shall be construed and enforced as if such illegal, invalid, or unenforceable provision had never been part of the Contract Documents, and the remaining provisions of the Contract Documents shall remain in full force and effect and shall not be affected by the illegal, invalid, or unenforceable provision, or by its severance.

30. Attorneys' Fees

- 30.1 Should the Authority employ an attorney to either (i) institute and maintain a suit against Vendor arising out of the Contract Documents or Vendor's Obligations; (ii) assist in enforcing or defending any of the Authority's rights under the Contract Documents; (iii) protect the Authority's interest in any matter arising under a contract with Vendor; (iv) collect damages for the breach of a contract or any other amounts owed to the Authority; or (v) recover on a surety bond given by the Vendor, then the Authority shall be

entitled to recover its attorneys' fees, costs, charges, and expenses expended or incurred therein from the Vendor if the Authority prevails in court, regardless whether the Authority recovers at law or in equity.

31. Notices

31.1 All requests, notices and other communications required or permitted to be given under the Contract Documents shall be in writing. Delivery of a notice shall be deemed to have been made when such notice is either:

- a) Duly mailed by first-class mail, postage prepaid, return receipt requested, or any comparable or superior postal or air courier service then in effect; or
- b) Transmitted by hand delivery, telegram, telex, telecopy or facsimile transmission, to the party entitled to receive the same at the address indicated below or at such other address as such party shall have specified by written notice to the other party. Notices to the Authority shall be sent to:

General Manager
Louisa County Water Authority
P.O. Box 9
3380 Jefferson Highway
Louisa, Virginia 23093

32. Contractual Claims Procedure

32.1 Contractual claims or disputes by Vendor against the Authority, whether for money or other relief, except for claims or disputes exempted by law from the procedure set forth herein, shall be submitted in writing no later than sixty (60) days after final payment; provided, however, that Vendor shall give the Authority written notice of its intention to file a claim or dispute within fifteen (15) days after the occurrence upon which the claim or dispute shall be based. Any written notice of Vendor's intention to file such a claim or dispute need not detail the amount of the claim, but shall state the facts and/or issues relating to the claim in sufficient detail to identify the claim, together with its character and scope. Whether or not Vendor files such written notice, Vendor shall proceed with the work as directed. If Vendor fails to make its claim or dispute, or fails to give notice of its intention to do so as provided herein, then such claim or dispute shall be deemed forfeited.

32.2 The Authority, upon receipt of a detailed claim, may at any time render its decision and shall render such decision within one hundred twenty (120) days of final payment. Each such decision rendered shall be forwarded to the Vendor by written notice.

32.3 If the Vendor disagrees with the decision of the Authority concerning any pending claim, the Vendor shall promptly notify the Authority by written notice that the Vendor is proceeding with the work under protest. Any claim not resolved, whether by failure of the Vendor to accept the decision of the Authority or under a written notice of Vendor's intention to file a claim or a detailed claim not acted upon by the governing body of the Authority, shall be specifically exempt by the Vendor from payment request, whether progress or final. Pendency of claims shall not delay payment of amounts agreed due in the final payment.

32.4 The Authority's decision on contractual claims shall be final and conclusive unless the Vendor appeals within six months of the date of the final decision on the claim by instituting legal action in the appropriate court.

33. Correction of Defective Work

33.1 Vendor shall promptly replace or correct any work or materials which Authority rejects as failing to conform to the requirements of the Contract Documents. If Vendor does not do so within a reasonable time, Authority shall have the right to replace or correct the defective work or materials and Vendor shall be liable to Authority for the cost thereof. If, in the opinion of Authority, it is not expedient to correct or replace all or any part of rejected work or materials, then Authority, at its option, may deduct from the payment due, or to become due, to Vendor such amounts as, in Authority's judgment, will represent the higher of: (i) the difference between the fair value of the rejected work and materials and the value thereof, if the work had complied with the Contract Documents; or (ii) the cost of correction.

I agree to these terms and conditions, and understand that they apply to and govern all purchases, regardless of the type of goods or services purchased, by the Louisa County Water Authority from Vendor.

Name Title

Vendor _____

Date _____