MSA, P.C.
5033 Rouse Drive, Virginia Beach, VA 23462-3708 • (757) 490-9264 • (757) 490-0634 [fax] • www.msaonline.com
Offices in Hampton Roads and Virginia's Eastern Shore
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February 28, 2012

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FEB 29 2012
Tidewater Regional Office

Mr. Bob Smithson
VPA Program
Virginia Department of Environmental Quality
5636 Southern Boulevard
Virginia Beach, VA 23462

RE: VPA Application
Virginia Pollution Abatement Permit VPA01047
Kuzzens Painter, VA Processing Plant
MSA Project #08719C

Dear Mr. Smithson,

Attached please fine a completed application for the renewal of the VPA permit for the subject facility. In preparing this application MSA submitted a request to have additional monitoring for certain parameters that are not routinely collected pursuant to permitted operations waived. A response to this request from your office was received and the necessary additional soil parameters have been collected. At this time however the results for these tests have not been received from the contract lab but will be submitted as an amendment as soon as they are received.

In calculating elemental balance MSA utilized the average results reported on the facilities 2011 Annual DMR. Where pertinent, MSA also utilized historical data gleaned from routine monitoring (effluent, soil and groundwater) of the site and from the permit renewal application dating back to 2002.

The subject facility is a basic operation where groundwater, of potable quality, is heated and chlorinated to facilitate the washing and packaging of agricultural products (tomatoes). The VPA permit covers the land disposal of spent wash water and culls (off size or damaged tomatoes).

Routine monitoring of the wash water effluent stream indicates that nutrients (N, P and K) are not in concentrations that would adversely affect the spray field crop or groundwater. Annual pesticide scans of the effluent stream and groundwater wells have not indicated site impacts. Site conditions and agronomic practices prevent run off from the subject site.

The primary compounds of concern anticipated in this waste stream are sodium, from the disinfectant which can disperse the soils and residual compounds related to pesticide use, primarily copper and zinc. Sodium dispersion of soils adversely impacts permeability and the site's capacity to retain the effluent. Copper and zinc accumulations are limiting factors for site life but to date have not been a significant impact. Parameters in the waste water are relatively constant and well below levels expected to have negative impacts to the site or surrounding environment.

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On behalf of the client, MSA is requesting that, upon review of this application, some adjustments to the monitoring frequencies be considered. These requests follow:

1. Reduce effluent "wastewater" monitoring frequency to once a month for all parameters except copper and zinc which would remain on a biweekly schedule.

2. Allow a single composite soil sample to be collected during the standard biennial (April and September) monitoring events. Note that the soils map for this application indicates three (3) soil types vice two (2) as was indicated in the prior application. The justification for this request is that these three (3) soil types are quite similar and site conditions are nearly identical for all three types that are listed. Given the low level of inputs to the site a composite sample (four cores per soil type) should provide the results needed to ascertain the capacity of the site's soils to absorb the impact of spray operations.

The application is presented in four parts as follows:

Section I
Virginia Pollution Abatement Application Part A
Topographic Site Location Map

Section II
Virginia Pollution Abatement Application Part C

Section III
Exhibits
- Exhibit A – Site locations and Topographic Map
- Exhibit B – Facility Schematic
- Exhibit C – Site Features
- Exhibit D – Land Application Methods
- Exhibit E – Soil Map

Section IV
Appendices
- Appendix I – Effluent Monitoring Result
- Appendix II – Ag Practices
- Appendix III – Technical Soil Descriptions
- Appendix IV – Soil Monitoring Results (pending)
- Appendix V – Land Requirement Calculations
- Appendix VI – Monitoring Waiver Request
- Appendix VII – References

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We believe that the information reported herein is accurate. In general, the facility when in operation does so with no significant or outstanding issues. If there are any questions regarding this application, please do not hesitate to contact me (757) 490-9264.

Sincerely,

Tony Dongarra
Compliance Manager

Attachments
Copy: Richard Davis

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Appendix I
Waste Water Monitoring Results

The September 13, 2011 sampling event was selected for submittal. The 2011 Annual DMR (file copy) is also submitted.

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DEPARTMENT OF ENVIRONMENTAL QUALITY
TIDEWATER REGIONAL OFFICE
5636 Southern Boulevard, Virginia Beach, Virginia 23462
(757) 518-2000 Fax (757) 518-2009
www.deq.virginia.gov

Doug Domenech
Secretary of Natural Resources

David K. Paylor
Director

Maria R. Nold
Regional Director

March 21, 2012

Mr. Richard Davis, Painter Farm Operations Manager
Kuzzens, Inc.
3769 Grapeland Circle
Exmore, VA 23350

RE: Kuzzens Inc. – Painter VA Processing Plant
VPA Permit No. VPA01047; Application Incomplete

Dear Mr. Davis:

We have reviewed the referenced application which was received February 29, 2012 and have determined that it is incomplete. Please address the following:

1) *Regulations require that Form A and form C be signed by an executive officer of the company.* Previously the application was signed by (then) CEO Daniel Maloney. Please revisit these forms with the appropriate corporate executive officer's signatures. If you qualify in that capacity, please indicate credentials in that regard.
2) We are missing a completed maintenance fee billing form. A blank is attached for your convenience.
3) Pages C.I.4. through C.I.7 – Recorded data are from 10 years ago (2002 application). Recent data are required. We recognize that it is too early in the operational year to collect current data, therefore a special condition will be incorporated into the permit requiring analyses of these parameters within 3 months of permit reissuance.
4) Appendix V – Land area determination calculations should be revisited. Figures dramatically vary from results submitted in 2002. We suspect it may be that the consultant is converting data that is already in mg/l. (Example: potassium balance calculations utilized a higher result than in 2002 (22.1 mg/l in 2002 vs. 28.3 mg/l) but balance results showed one third less acres needed for application.
5) Cull disposal discussion was omitted. An example from 2002 is attached. If the map is still current, please indicate so and we will incorporate it into this application.
6) A land application methodology and equipment narrative was omitted. An example from 2002 is attached. If the information is still current, please incorporate/revise it for this application.

7) Please submit *soil monitoring results* when they become available.
8) Please provide a copy of a current nutrient management plan, including but not limited to PAN discussion or indicate when one will be available for submittal.

Please provide all additional information, revised/dated signatures and corrections by April 16, 2012. No further processing action on this application can proceed until complete.

If we may be of further assistance, do not hesitate to contact me at DEQ's Tidewater Regional Office at (757)-518-2106.

Sincerely,

Robert E. Smithson, Jr.
Environmental Specialist Senior

cc: DEQ-TRO ECM file
Tony Dongarra, Compliance Manager - MSA PC

Smithson Jr., Robert (DEQ)

From: Tony Dongarra [Tony.Dongarra@msaonline.com]
Sent: Wednesday, April 04, 2012 3:32 PM
To: Smithson Jr., Robert (DEQ)
Cc: Richard Davis
Subject: Response to 3_21_2012 VPA Comment Letter
Attachments: Permit Maint Fee Form.pdf; MSA Revised Calculations 3_30_2012.pdf; Appendix VIII Cull Disposal.pdf; Appendix IX Land Application.pdf; APP II Ag practises and NMP.pdf

Mr. Smithson:

The following is our responses pertaining to your comment letter received via email on march 22, 2012 regarding the permit re-application for VPA permit # 01047

1) *Regulations require that form A and Form C be signed by an executive officer of the company……* MSA has forwarded the appropriate sheets to Mr. Gerry Odell who will forward the forms to the appropriate person.

2) *We are missing a completed maintenance fee billing form……* A completed form is attached. Please be advised that this form was not included on the DEQ website.

3) *Pages C.1.4. through C. 1.7 – Recorded data are from 10 years ago. Recent data are required. Requirement will be incorporated into new permit for collection in the first three months……* Noted. MSA had understood / intended that the monitoring waiver request would cover these parameters as well. Please ensure that the provision to collect the required samples stipulates that they will be collected during the first three months of active operations.

4) Appendix V – *Land area determination calculations should be revisited. Figures vary considerably from 2002.* There is a six fold variance between the calculations submitted in 2002 and 2012. Most of the variance is explained because flow rates and analytical results were both approximately half that used for the 2002 calculations. We did find that our spread sheet was based on kilo grams not pounds. The necessary conversions were made and the revised sheets are attached.

5) *Cull disposal discussion was omitted….* A cull disposal discussion has been labeled as Appendix VIII and is attached. Fundamentally the maps have not changed and the discussion references Exhibit 3. You may include existing maps at your option.

6) *A land application and equipment narrative was omitted……* A supplemental land application narrative is included as Appendix IX.

7) *Please submit soil monitoring results when they become available……* MSA has further inquired into the results of the soil monitoring and am awaiting notification from the lab.

8) *Please provide a copy of a current nutrient management plan……* An NMP was submitted as part of Appendix II along with ag practices, elements of both sections could be interchangeable. Appendix II has been modified to include a PAN discussion and is attached.

It is MSA and the client's understandings that the requirement for a NMP predates the current DCR requirement to have certified plans written. Given this and the fact that the applied spent wash water does not contain

nutrients that are in excess of what is required by the cover crop the NMP provided is a narrative summary of best management practices observed at the site. If more than this is required, MSA and the client request that full NMP requirements be clarified.

--

Tony Dongarra
Project Manager
MSA, P.C.

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Fax: 757.490.0634
tony_dongarra@msaonline.com
http://www.msaonline.com

Virginia Certified Small Business Enterprise
Offices in Hampton Roads and Virginia's Eastern Shore

VIRGINIA POLLUTION ABATEMENT PERMIT APPLICATION
FORM A
ALL APPLICANTS

1. Facility	Name	Kuzzens Incorporated Painter Virginia Processing Plant
	County/City	Accomack County
	Address	3769 Grapeland Circle, Exmore, VA 23350
2. Owner	Legal Name	Kuzzen's Inc.
	Mailing Address	PO Box 1227 Immokalee, FL 33924
	Telephone Number	941 657-4421
	Email address	
3. Owner Contact	Name	Richard Davis
	Title	Farm Operations Manager
	Mailing Address	3769 Grapeland Circle, Exmore, VA 23350
	Telephone Number	757 442-4961
	Email address	rdavis@sixls.com

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4. Existing permits (e.g., VPA, VPDES; VWP, RCRA; UIC); other:

Agency	Permit Type	Permit Number
VDEQ	VPA	VPA 01047
VDH-ODW	Transient non community water supply	PWSID 3001796

5. Nature of Business: The establishment is seasonally engaged in performing services on crops (tomatoes), subsequent to their harvest, with the intent of preparing them (via washing, disinfection and packaging) for further market distribution or processing.

SIC Code(s):	0723		

6. Type of Waste:
(check box as appropriate)

	Proposed	Existing
Animal Waste (complete Form B)	☐	☐
Industrial Waste (complete Form C)	☐	☒
Land Application of Municipal Effluent (complete Form D, Part I)	☐	☐
Land Application of Biosolids/Sewage Sludge (complete Form D, Part II)	☐	☐
Reclamation and/or Distribution of Reclaimed Wastewater (Application Addendum)	☐	☐

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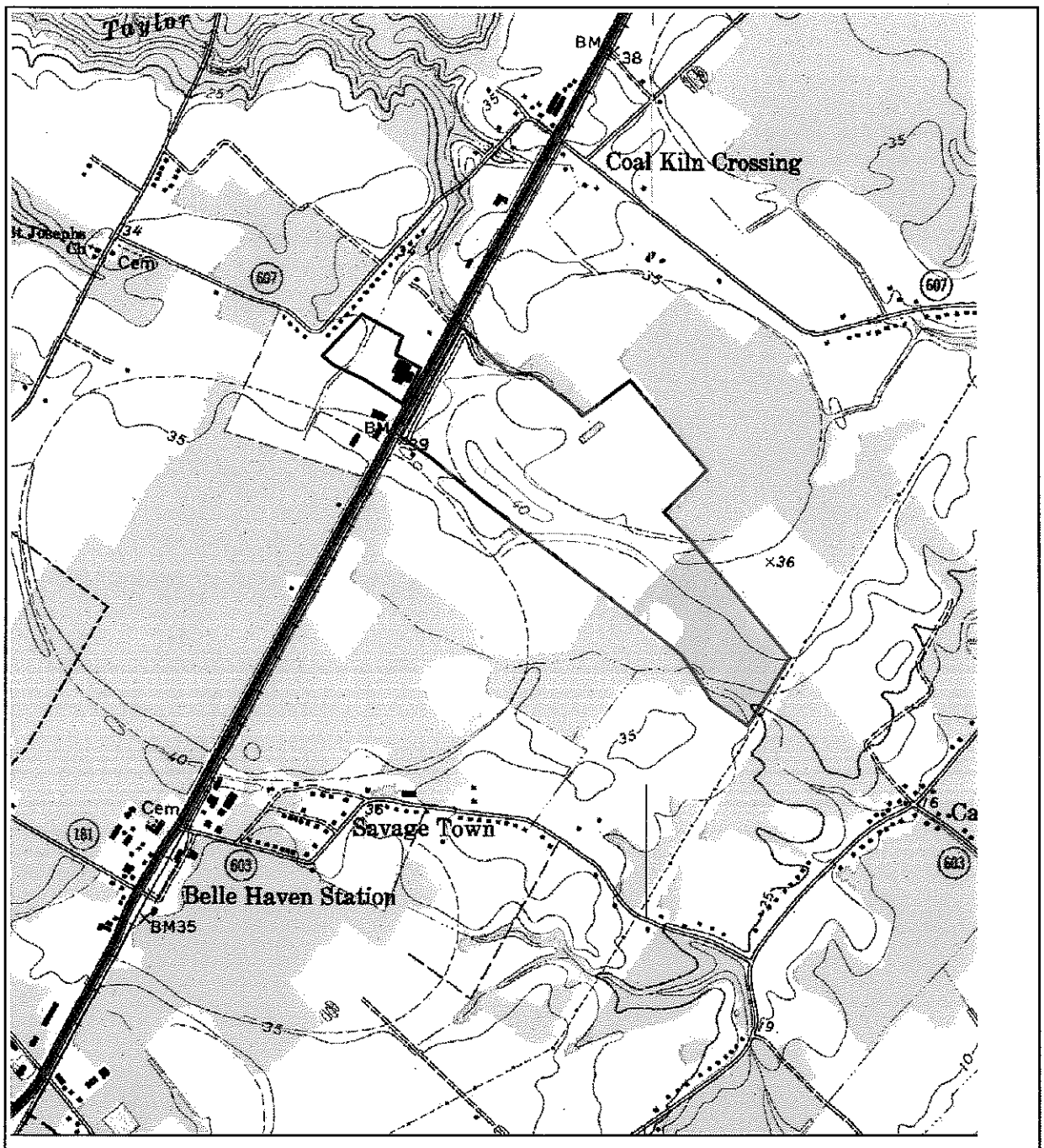
7. General Location Map:



Source: Exmore, Virginia USGS Quadrangle Topographic Maps

N

USGS TOPOGRAPHIC TOPO VICINITY MAP	MSA JOB # 08719C	DATE:	SCALE NTS	By:
KUZZENS INC. PROCESSING PLANT PAINTER, VIRGINIA	MSA, P.C. 5033 Rouse Drive, Virginia Beach, VA. 23462 (757) 490-9264 (ofc) (757) 490-0634 (fax) www.msaonline.com Environmental Sciences + Planning + Surveying Engineering + Landscape Architecture			

hard copy to follow

VIRGINIA POLLUTION ABATEMENT PERMIT APPLICATION
FORM A
ALL APPLICANTS

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. I further certify that I am an authorized signatory as specified in the VPA Permit Regulation (9VAC25-32).

Signature:	Gerard B. Ottell	Date: 4/4/12
Printed Name:	Gerard B. Ottell Sr.	
Title:	Chief Farming Officer	

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Item 2

Please submit this completed form with your application
Maintenance fee billing will be sent using this information

Permit Maintenance Fee Information

(1) Facility Name: KOZZENS INC.
(Please indicate all facility names applicable for the information listed below)

(2) Permit Number(s):
VPA D1047
(Please indicate all VPDES individual permit numbers applicable for the information listed below)

(3) Tax Payer ID [FIN]: 59-0709966

(4) Billing Information:

Corporate Name or Owner Name KOZZENS INC.

Corporate Billing Address or Owner Address:
315 E. NEW MARKET RD.
IMMOKALEE, FL 34142

(5) Billing Contact:

Name, Title: RICHARD DAVIS

Phone Number: (239) 442-4961

E-mail Address: RDAVIS@SIXLS.COM

VIRGINIA POLLUTION ABATEMENT PERMIT APPLICATION

FORM C

INDUSTRIAL WASTE

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PART C-I General Information

1. Facility Name: Kuzzens Incorporated Painter VA Processing Plant

2. Source(s) of Waste

a. *Provide a narrative which explains your facility operations and how wastes are produced.*

Tomatoes are harvested and transported to the processing facility via 1,600 – 2,800 pound transport containers. The product is dumped, via hydraulic lift, from the containers into a wash flume. The wash flume is filled with groundwater from two onsite wells. The water is further heated to the approximate temperature of the product and treated with sodium hypochlorite to a concentration of 75 ppm. Tomatoes are further rinsed, sorted graded and packaged for distribution. On average 18,000 gallons per day wash water is generated. Spent wash water is aerated and then land applied.

b. *Attach a line drawing of the facility in block diagram for showing the manufacturing or processing operations and all points where wastes are produced.*

See Exhibit B

c. *Explain how sewage from employees is handled (i.e., septic tank/drainfield,sanitary sewer etc.):*

All domestic sewage is directed to an onsite subsurface disposal field. The disposal field construction permit was approved by the local VDH field office on September 17, 2010. Permit ID number is 10-100-0262. The drain field location is noted on Site Features Map, Exhibit C.

hard copy to follow

d. *Operational Parameters*

Maximum hours/day of operation:	*18 / hours per day*
Average hours/day of operation:	*12 / per day of operation*
Days/week of operation:	*weather dependant 0 - 7*
Specific months of operation:	*June - November*

3. Non-Hazardous Declaration

a. *Statement for Plant Operations*

Is any part of the manufacturing operations, plant processes or waste treatment facilities at these plant facilities under the purview of the "Virginia Hazardous Waste Management Regulations" or the "Virginia Solid Waste Management Regulations?" _____ *Yes* _X_ *No.*

If Yes, please provide a brief explanation of the type of permit or requirements that apply.

NA

b. *For waste to be land applied, a responsible person, as defined by VR680-14-01, must sign the following statement.*

I certify that the waste described in this application is non-hazardous and not regulated under the Resource Conservation and Recovery Act.

Chief Farming Officer **Date** 4/4/12
(Signature of Owner)

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4. Waste Characterization

a. *Wastewater - Provide at least one analysis for each parameter. Upon review, additional analyses may be required by DEQ. The system has been inactive (zero discharge) since the end of the 2009 operating period. Concentrations provided are either annual average from 2009 or as otherwise noted (*) derived from the 2002 permit renewal.*

Parameter	Concentration	
Flow to treatment	0.017	MGD
Flow to storage	0.017	MGD
Vol. to treatment	0.017	MG
Vol. to storage	0.017	MG
Vol. Land applied	0.96	MG/year
BOD_5	Waived	mg/l
COD	Waived	mg/l
TOC	Waived	mg/l
TSS	Waived	mg/l
Percent Solids	Waived	%
PH	6.6	S.U.
Alkalinity as $CaCO_3$	Waived	mg/l
Nitrogen, (Nitrate)	2.1	mg/l
Nitrogen, (Ammonium)	ND	mg/l
Nitrogen, (Total Kjeldahl)	3.4	mg/l
Phosphorus, (Total)	2.2	mg/l
Potassium, (Total)	28.3	mg/l
Sodium	58.1	mg/l
		mg/l

b. *Sludge - Provide at least one analysis for each parameter. Upon review, additional analyses may be required by DEQ.* ***NA***

Parameter	Concentration*	
Percent Solids		%
Volatile Solids		%
pH		S.U.
Alkalinity as $CaCO_3$**		mg/kg
Nitrogen (Nitrate)		mg/kg
Nitrogen (Ammonium)		mg/kg
Nitrogen (Total Kjeldahl)		mg/kg
Phosphorous (Total)		mg/kg
Potassium (Total)		mg/kg
Lead		mg/kg
Cadmium		mg/kg
Copper		mg/kg
Nickel		mg/kg
Zinc		mg/kg
		mg/kg

Sludge is not generated at this site

* Unless otherwise noted, report results on dry weight basis.

** Lime treated sludges (l0% or more lime by dry weight) should be analyzed for percent $CaCO_3$.

c. *Provide a separate waste characterization listing for each wastewater and sludge generated at the facility. Insert "Yes" beside all parameters believed present and provide at least one analysis for each. Insert "No" beside all parameters believed not present. Indicate "NA" for any parameter already addressed in Item 4a. or 4b.*

Parameter	Believed Present (yes or no)	Concentration*
Sodium	NA	–
Bromide	Yes	1.4 mg/l
Total Residual Chlorine	Yes	0.7 mg/l
Fecal Coliform	Yes	2-2.4 MPN/100 ml
Fluoride	No	
Oil & Grease	Yes	8 mg/l
Total Radioactivity	No	–
Total Alpha	No	–
Total Beta	No	–
Total Radium	No	–
Total Radium 226	No	–
Sulfate (as SO_4)	Yes	37.21 mg/l
Sulfide (as S)	No	–
Sulfite (as SO_3)	No	–
Surfactants	No	–
Total Aluminum	No	–
Total Barium	No	–
Total Boron	Yes	<0.02 mg/l
Total Cobalt	No	–
Total Iron	Yes	3.48 mg/l
Total Magnesium	Yes	10.16mg/l
Total Molybdenum	No	–
Total Manganese	Yes	2.98 mg/l
Total Tin	No	–
Total Titanium	No	–
Total Antimony	No	–
Total Arsenic	Yes	0.01 mg/l
Total Beryllium	Yes	<0.005 mg/l
Total Cadmium	Yes	<0.005 mg/l
Total Chromium	Yes	<0.01 mg/l
Total Copper	Yes	0.62 mg/l
Total Lead	Yes	<0.1 mg/l
Total Mercury	No	–
Total Nickel	Yes	<0.04 mg/l
Total Selenium	Yes	<0.02 mg/l
Total Silver	Yes	<0.005 mg/l
Total Thallium	Yes	<0.01 mg/l
Total Zinc	Yes	0.33 mg/l
Total Cyanide	No	–
Total Phenols	No	–
Dioxin	No	–
Acrolein	No	–

*If the analysis is for sludge, report results on dry weight basis.

c. (Continued)

Parameter	Believed Presen (yes or no)	Concentration
Acrylonitrile	Yes	4.6 ug/1
Benzene	No	
Bis(Chloromethyl)Ether	No	
Bromoform	No	
Carbon Tetrachloride	No	
Chlorobenzene	No	
Chlorodibromomethane	Yes	2.3 ug/1
Chloroethane	No	
2-Chloroethylvinyl Ether	No	
Chloroform	Yes	2770 ug/1
Dichlorobromomethane	No	
Dichlorodifluoromethane	No	
1,1-Dichloroethane	No	
1,2-Dichloroethane	No	
1,1-Dichloroethylene	No	
1,2-Dichloropropane	No	
1,3-Dichloropropylene	No	
Ethylbenzene	No	
Methyl Bromide	No	
Methyl Chloride	No	
Methylene Chloride	No	
1,1,2,2-Tetrachlorethane	No	
Tetrachloroethylene	No	
Toluene	No	
1,2-TransDichloroethylene1	No	
1,1,-Trichloroethane	No	
1,1,2,-Trichloroethane	No	
Trichloroethylene	No	
Trichlorofluoromethane	No	
Vinyl Chloride	No	
2-Chlorophenol	No	
2,4-Dichlorophenol	No	
2,4-Dimethylphenol	No	
4,6-Dinitro-O-Cresol	No	
2,4-Dinitrophenol	No	
2-Nitrophenol	No	
4-Nitrophenol	No	
P-Chlor-M-Cresol	No	
Pentachlorophenol	No	
Phenol	No	
2,4,6-Trichlorophenol	No	
Acenaphthene	No	
Acenaphtylene	No	
Acenaphtylene	No	
Benzidine	No	
Benzo(a)Athracene	No	
Benzo(a)Pyrene	No	
3,4-Benzofluoranthene	No	
Benzo(ghi) Perylene	No	
Benzo(k)Fluoranthene	No	
Bis(2-Chloroethoxy)Methane	No	
Bis(2-Chloroethyl) Ether	No	
Bis(2-Chloroisopropyl)Ether	No	
Bis(2-Ethylhexyl)Phthalate	Yes	4.4 ug/1
4-Bromophenyl Phenyl Ether	No	
Butyl Benzyl Phthalate	No	
4-Chlorophenyl Phenyl Ether	No	
2-Chloronaphthalene	No	
Chrysene	No	
Dibenzo(a,h) Anthracene	No	

c. (Continued)

Parameter	Believed Present (yes or no)	Concentration
1,2-Dichlorobenzene	No	
1,3-Dichlorobenzene	No	
1,4-Dichlorobenzene	No	
3,3'-Dichlorobenzidine	No	
Diethyl Phthalate	No	
Dimethyl Phthalate	No	
Di-N-Butyl Phthalate	No	
2,4-Dinitrotoluene	No	
2,6-Dinitrotoluene	No	
Di-N-Octyl Phthalate	No	
1,2-Diphenylhydrazine(as	No	
Azobenzene)	No	
Fluoranthene	NO	
Fluorene	No	
Hexachlorobenzene	No	
Hexachlorobutadiene	No	
Hexachlorocyclopentadiene	No	
Hexachloroethane	No	
Indeno(1,2,3-cd)Pyrene	No	
Isophorone	No	
Naphthalene	No	
Nitrobenzene	No	
N-Nitrosodimethylamine	No	
N-Nitrosodi-N-Propylamine	No	
N-Nitrosodiphenylamine	No	
Phenanthane	No	
Pyrene	No	
1,2,4 - Trichlorobenzene	No	
Aldrin	No	
α- BHC	No	
β- BHC	No	
γ- BHC	No	
δ- BHC	No	
Chlordane	No	
4,4'- DDT	No	
4,4'- DDE	No	
4,4'- DDD	No	
Dieldrin	No	
α-Endosulfan	No	
β-Endosulfan	No	
Endosulfan Sulfate	No	
Endrin	No	
Endrin Aldehyde	No	
Heptachlor	No	
Heptachlor Epoxide	No	
PCB - 1242	No	
PCB - 1254	No	
PCB - 1221	No	
PCB - 1232	No	
PCB - 1248	No	
PCB - 1260	No	
PCB - 1016	No	
Toxaphene	No	
Chloromethane	No	
Chlorpyrifos	No	
Demeton	No	
Dichloromethane	No	
(2,4-dichlorophenoxy) acetic	No	
acid (2,4-D)	No	
Di-2-Ethylhexyl Phthalate	No	
MBAS	No	

c. (Continued)

Parameter	Believed Present (yes or no)	Concentration
Lindane	NO	
Hydrogen Sulfide	NO	
Silvex	NO	
Tributyltin	NO	
Kepone	NO	
Malathion	NO	
Methoxyclor	NO	
Mirex	NO	
Monochlorobenzene	NO	
Parathion	NO	

d. *Provide a separate waste characterization listing for each wastewater and sludge generated at the facility. List any additional parameters believed present in the spaces provided below and provide at least one analysis for each.*

Parameter	Concentration
BROMODICHLOROMETHANE	64 ug/L

5. Briefly describe the design and provide a line drawing of the waste treatment facility which relates the various components of the treatment system including source(s), treatment unit(s), disposal alternatives, and flow estimates from the various process units.

Wastewater (expended wash flume water) containing sodium hypochlorite is conveyed to a series of two (2) holding 1,200 gallon holding tanks. A 2 hp transfer pump rated at 100 gpm is utilized to transfer the waste water to a single 60,000 gallon ground storage tank. The water is continually aerated using a 35 cfm air blower. A Maximum of 18,000-gallons per day is generated providing 3.3 days worth of detention time to allow the wastewater to gas off free chlorine prior to field application. A second transfer pump is load aerated wastewater to a 3,600 gallon capacity spreader tanker which is used to land apply the waste water on the designated spray fields.

6. Indicate the number and type of waste storage facilities. If existing, indicate the volume; DEQ may require additional information upon review.

No.		Existing (Volume)	Proposed
____	Earthen Storage Pond	_____	_____
____	Storage Pit	_____	_____
1	Storage Tank	60,000 gallons	_____
____	Anaerobic Lagoon	_____	_____
2	Other (Holding Tanks)	1,250 gal each	_____
		_____	_____

7. Have the existing storage/treatment facilities identified in Item 5 and 6 above been previously approved by the Department of Environmental Quality?
Yes_X___No_____

If yes, provide the date of the approval and proceed to Item 8.
Approval Date: *August 29, 2002*

If no, provide information required by Items 9, 10, and ll.

8. Have the previously approved facilities been altered or expanded?
Yes_____No_X___

If yes, it will be necessary to provide the information for such facilities, as required by Items 9 & 10, and 11.

If no, proceed to Item 12.

9. Provide conceptual design for the treatment facilities including design approach used. Explain how ground water will be protected. Demonstration should include soil evaluation, geology, hydrology, and topography. The following information must be provided for each proposed facility identified in Item 6 above and for those existing facilities in Items 7 and 8 which have not been either previously approved or were altered: **NA**

   a. *Design calculations for volume (ft^3) and estimated days of storage*

   b. *Description of lining material and permeability*

   c. *Plan and cross-sectional views*

   d. *Depth to seasonal high water table and separation to permanent water table.*

10. Will the proposed waste storage/treatment facilities be located within the 100-year flood plain? _____Yes _____No.

    If yes, what is the elevation of the l00-year flood plain and elevation of the proposed facilities. Also, how will the waste storage facilities be protected from flooding? (Flood elevation can be obtained from your local county zoning/planning department).

    NA

11. Will the proposed or existing storage/treatment facilities receive any storm water runoff? _____Yes __X__No.

    If yes, provide total area (square feet, acres, etc.) from which runoff will occur and indicate this area on the line drawing (Item 5). **NA**

    Total area: _____
    Dimensions: _____

12. Will any part of the waste generated at your facility be land applied? Yes __X__ No _____. If yes, Part C-II must be completed.

VIRGINIA POLLUTION ABATEMENT PERMIT APPLICATION

FORM C

INDUSTRIAL WASTE

PART C-II Land Application and Waste Handling Procedure

Facility Name: Kuzzens Incorporated Painter, VA Processing Plant

Items 1-12 pertain to the land application of industrial sludge/wastewater at frequent and infrequent rates. The applicant may request a waiver in writing for any of the required information if it is not pertinent to their operation.

1. For each land application site provide a topographic map of sufficient scale (5 foot contour preferred) clearly showing the location of the following features within 0.25 mile of the site. Provide a legend with approximate scale. (See General Instructions for map requirements.)

See Exhibit A and C

a. *Proposed or existing ground water monitoring wells*
b. *General direction of ground water movement*
c. *Water wells, abandoned or operating*
d. *Surface water*
e. *Springs (NA)*
f. *Public water supply(s)*
g. *Sink holes (NA)*
h. *Underground and/or surface mines (NA)*
i. *Mine pool (or others) surface water dischargepoints (NA)*
j. *Mining spoil piles and mine dumps (NA)*
k. *Quarry(s) (NA)*
l. *Sand and gravel pits (NA)*
m. *m. Gas and oil wells (NA)*
n. *Diversion ditch(s) (NA)*
o. *Agricultural drainage ditch(s)*
p. *Occupied dwellings, including industrial and commercial establishments*
q. *Landfills or dumps (NA)*
r. *Other unlined impoundments (NA)*
s. *Septic tanks and drainfields*
t. *Injection wells*
u. *Rock outcrops (NA)*
v. *Soil boring or test pits locations (NA)*
w. *Subsurface drainage tile (NA)*

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2. For each land application site provide a site plan of sufficient detail to clearly show any landscape features which will require buffer zones or may limit land application. Provide a legend and clearly mark the field boundaries and property lines. The following landscape features should be delineated. (See General Instructions for map requirements.) See Exhibit C

   a. *Drainageways*
   b. *Rock outcrops*
   c. *Sink holes*
   d. *Drinking water wells and springs*
   e. *Monitoring wells*
   f. *Property lines*
   g. *Roadways*
   h. *Occupied dwellings*
   i. *Slopes (greater than 8% by slope class)*
   j. *Wet spots*
   k. *Severe erosion (SCS designation)*
   l. *Frequently flooded soils (SCS designation)*
   m. *Surface waters*

3. Provide a complete description of agronomic practices for each crop to be grown, on field-by-field basis including a nutrient management program, soil and/or plant tissue testing, and the coordination of tillage practices, planting and harvesting schedules and timing of land application.

   See Appendix II

4. Describe all land application methods and any equipment used in the process.

   See Exhibit D & D2

5. Provide a detailed soil survey map, preferably photographically based, with the field boundaries clearly marked. (A USDA-SCS soil survey map should be provided, if available.)

   See Exhibit E

   Provide a detailed legend for each soil survey map which uses accepted USDA-SCS descriptions of the typifying pedon for each soil series (soil type). Complex associations may be described as a range of characteristics. Soil descriptions should include the following information.

   a. *Soil symbol*
   b. *Soil series, textural phase and slope class*
   c. *Depth to seasonal high water table*
   d. *Depth to bedrock*
   e. *Estimated productivity group (for the proposed crop rotation).*
   f. *Estimated infiltration rate (surface soil)*
   g. *Estimated permeability of most restrictive subsoil layer*

   See Appendix III

6. Representative soil borings for frequent land application and fixed spray irrigations, (to no less than 5 ft. or to the water table) are to be conducted for the typifying pedon of each soil series (soil type) and the following data collected and tests performed. All results for infiltration and permeability tests should be enclosed. Provide information on the items below:

Land application is seasonal so this requirement is not required for this site.

   a. *Soil symbol*
   b. *Soil series, textural phase and slope class*
   c. *Depth to seasonal high water table*
   d. *Depth to bedrock (NA)*
   e. *Estimated productivity group (for the proposed crop rotation).*
   f. *Estimated infiltration rate (surface soil)*
   g. *Estimated permeability of most restrictive subsoil layer*

7. Representative soil samples are to be collected for each major soil type and analyzed for the soil parameters indicated on Page C-II.6. Samples are to be taken at a depth of 0-6 in.

See Appendix IV

8. Land Area Determination:

   a. *Land area requirements are to be calculated and justified for each of the parameters listed below:*

Parameters	*Method of Determining Required Area*
1. *Nitrogen*	*Crop uptake, immobilization denitrification, leaching*
2. *Phosphorus*	*Crop uptake, soil adsorption*
3. *Potassium*	*Crop uptake*
4. *Sulfur*	*Crop uptake, soil adsorption leaching*
5. *Salts*	*Sodium Adsorption Ratio (SAR), leaching*
6. *Carbon/Nitrogen Ratio*	
7. *Metals(Ni, Cu, Zn, Pb, Co, Cd or other)*	*Cumulative loading for site life*
8. *Anions (As, B, Chlorides)*	*Leaching, Soil Adsorption*
9. *Calcium Carbonate Equivalency*	*Soil pH management*
10. *Other Parameters (As needed or as requested by DEQ)*	

For each parameter and method of assimilation, (i.e. crop uptake, denitrification, immobilization, soil adsorption leaching, etc.), the required land area is to be justified by attaching calculations and appropriate references. Allowances for soil adsorption are to be justified by pertinent soil testing.

Provide calculations describing the nutrient value of the waste as lbs per dry ton or mg/l nitrogen (PAN), phosphorus (P_2O_5), potassium (K_2O), and any liming effects which may occur from land application.

b. *Land area requirements for application of industrial wastewater or liquid sludge are to be determined and an annual water balance on a monthly basis developed integrating the following factors:*

1. *Monthly precipitation*
2. *Monthly evapotranspiration data*
3. *Soil percolation rates (from subsurface permeability data)*
4. *Monthly wastewater loading*
5. *Monthly storage requirement*
6. *Monthly storage input/drawdown*

See Appendix V

9. Does the volume of wastewater generated as determined by the water balance in 8.b. exceed the hydraulic loading rate (inches/acre/year) of the soils? _____Yes __X__No

If Yes, explain how excess loading will be disposed of:

_____
_____
_____
_____
_____
_____
_____
_____

10. Is the land application site owned by the applicant? __X__Yes_____No.

If No, answer question 11 and have the land owner complete the authorization form, Page C-II-5.

11. Complete page C-II.5 by providing the name(s), address(es), site locations and signatures of non-applicant land owner on whose property industrial waste will be applied (A separate approval will be required for each additional owner.):

NA

AUTHORIZATION TO LAND APPLY WASTE
(Land Owner must sign and date this approval)

NA

As land owner, I authorize _____ to land apply wastewater/sludge to my property in accordance with their VPA Form C application. This authorization will remain in effect until such time as I notify the Department of Environmental Quality in writing that this authorization has been withdrawn.

Name: _____

Address: _____

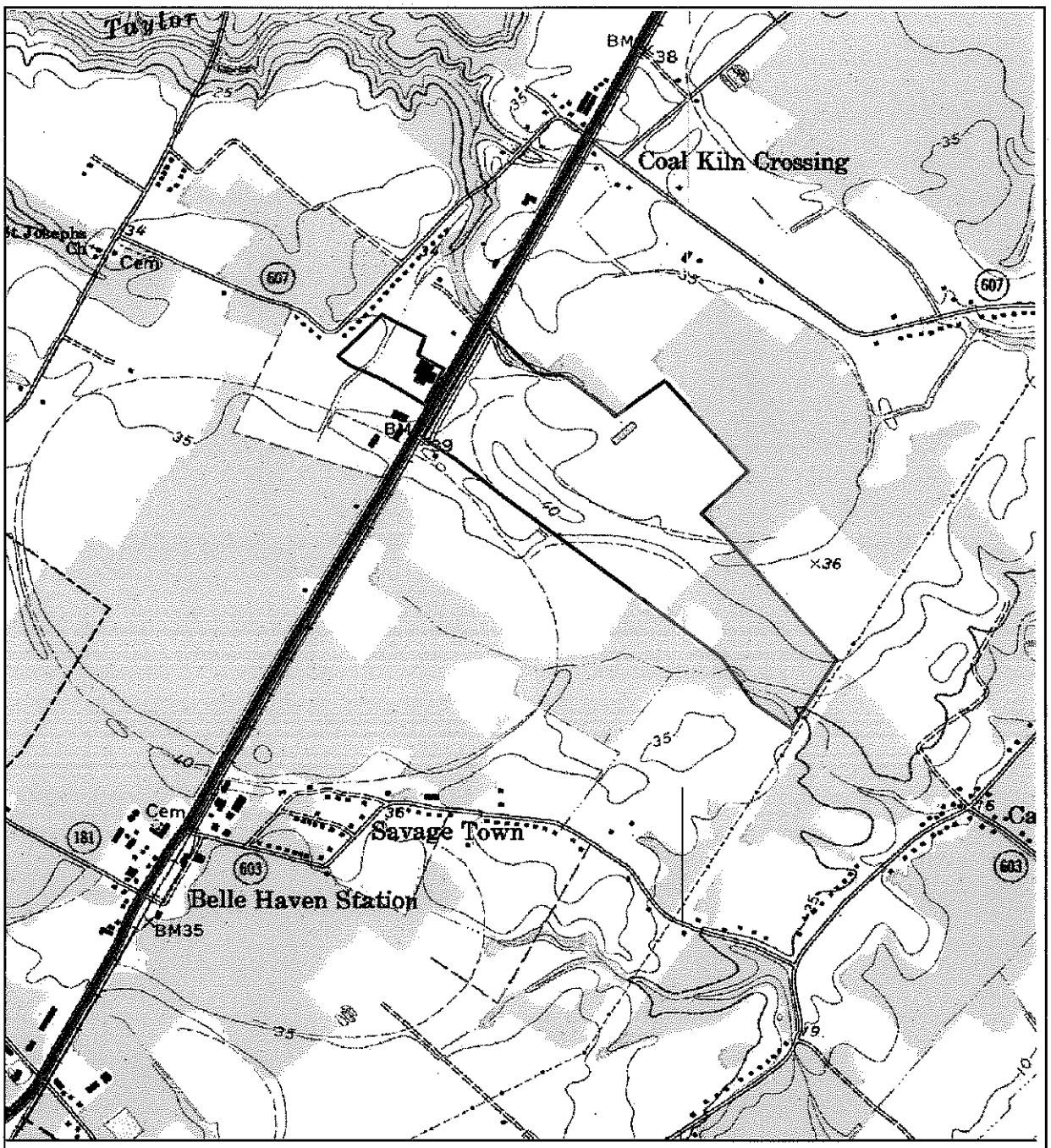
_____

Telephone: _____

Site Location(s) _____

Date: _____

Signature: _____



Source: Exmore, Virginia USGS Quadrangle Topographic Maps

N

EXHIBIT A TOPO AND FEATURES MAP	MSA JOB # 08719C	DATE:	SCALE NTS	By:
KUZZENS INC. PROCESSING PLANT PAINTER, VIRGINIA	MSA, P.C. 5033 Rouse Drive, Virginia Beach, VA. 23462 (757) 490-9264 (ofc) (757) 490-0634 (fax) www.msaonline.com Environmental Sciences + Planning + Surveying Engineering + Landscape Architecture			

SOIL TEST PARAMETERS FOR LAND APPLICATION SITES[1]

Parameter	Sludge – Frequent below Agronomic Rates[2]	Sludge - Frequent at Agronomic Rates[3]	Sludge - Infrequent	Wastewater
Soil Organic Matter (%)		*		*
Soil pH (Std. Units)	*	*	*	*
Cation Exchange Capacity (me/100g)	*	*	*	*
Total Nitrogen (ppm)		*		*
Organic Nitrogen (ppm)		*		*
Ammonia Nitrogen (ppm)		*		*
Nitrate Nitrogen (ppm)		*		*
Available Phosphorus (ppm)	*	*	*	*
Exchangeable Potassium (mg/100g)	*	*	*	
Exchangeable Sodium (mg/100g)		*		*
Exchangeable Calcium (mg/100g)		*		*
Exchangeable Magnesium (mg/100g)		*		*
Copper (ppm)		*		*
Nickel (ppm)		*		*
Zinc (ppm)		*		*
Cadmium (ppm)		*		*
Lead (ppm)		*		*
Chromium (ppm)		*		*
Manganese (ppm)		*		*
Particle Size Analysis or USDA Textural Estimate (%)		*		*
Hydraulic Conductivity (in/hr)				*

(1) Unless otherwise stated, analyses shall be reported on a dry weight basis.
(2) Less than 70% of agronomic nitrogen rates (annual basis).
(3) Test requirements will be adjusted based on previous test results.
* Test for these parameters.

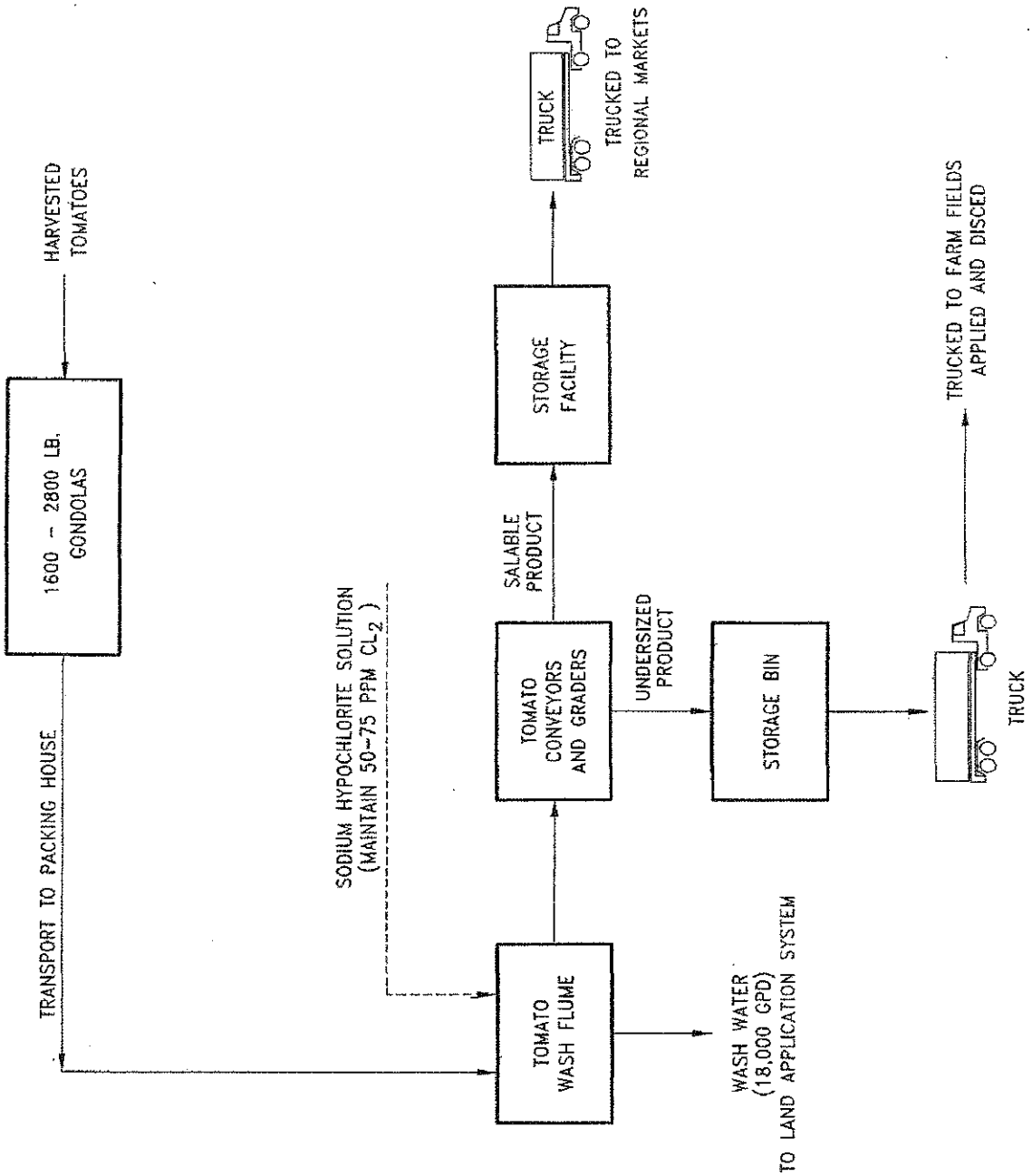


EXHIBIT B
FACILITY SCHEMATIC

KUZZENS INC. PROCESSING PLANT
PAINTER, VIRGINIA

MSA JOB #	DATE:	SCALE	By:
08717C	2/1/2012	NTS	DEQ

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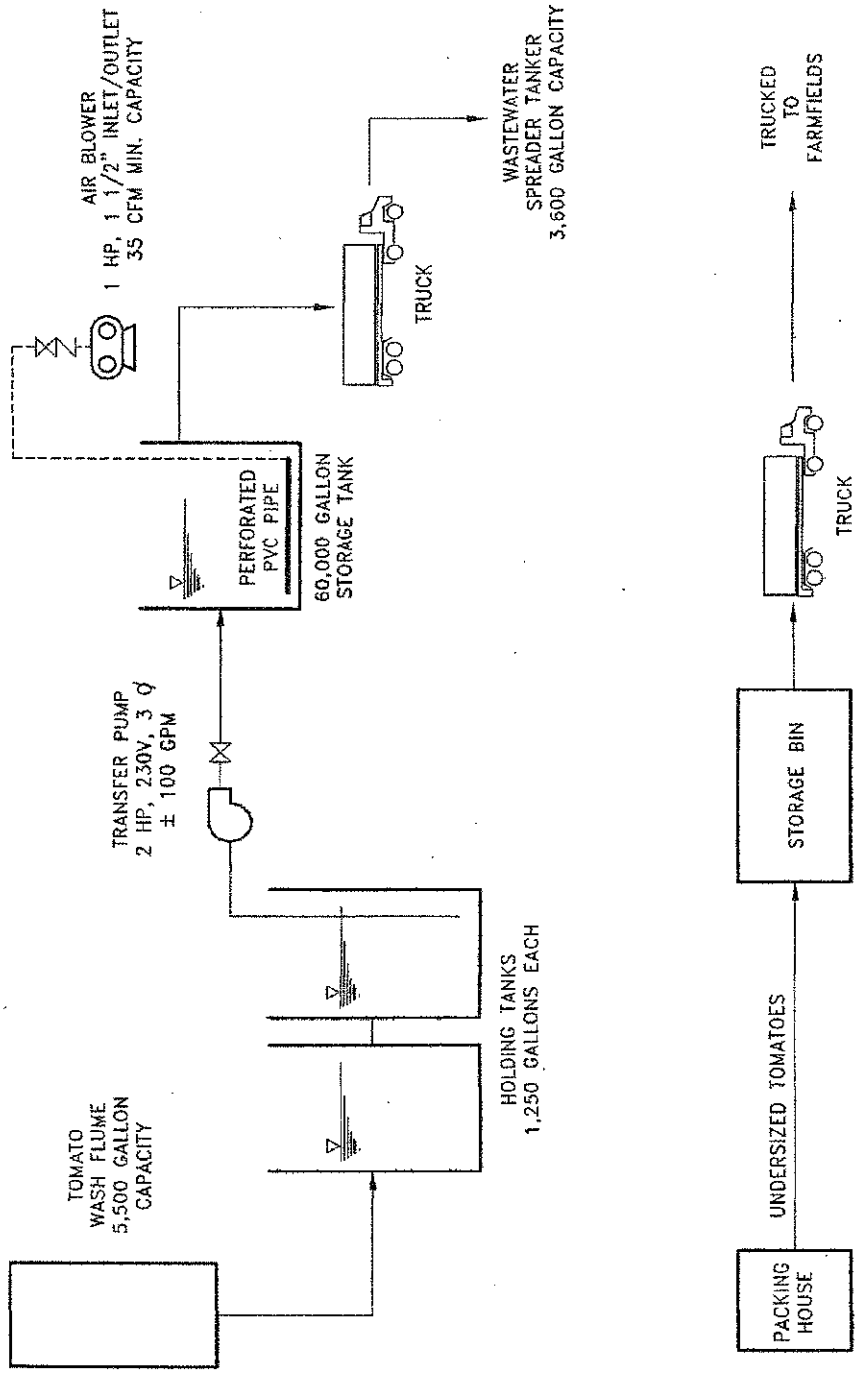

EXHIBIT D 1 LAND APPLICATION METHODS	MSA JOB #	DATE:	SCALE	By:
	08719C	2/1/2012	NTS	DEQ

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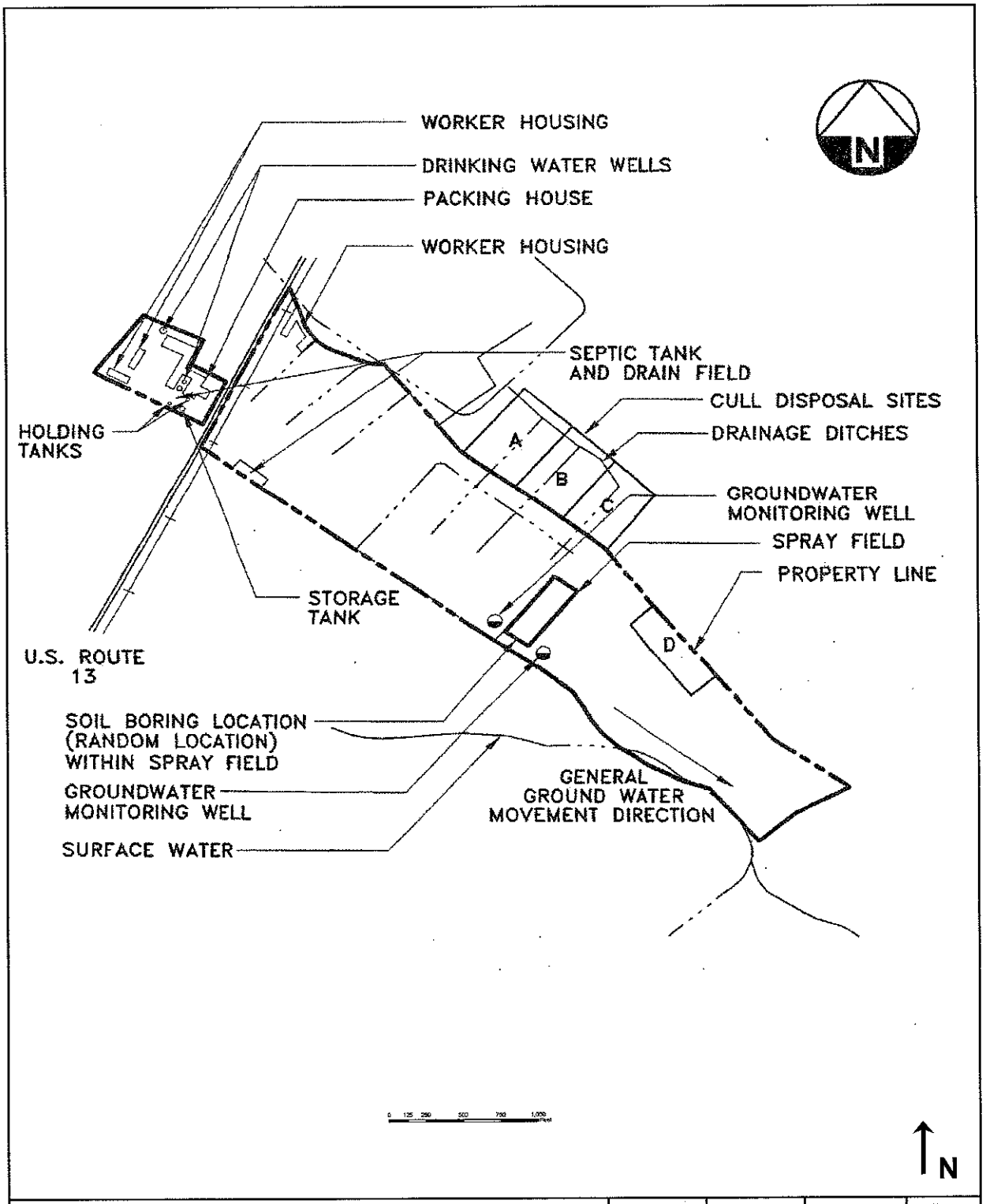

EXHIBIT C SITE FEATURES	MSA JOB # 08719C	DATE: 2/1/2012	SCALE NTS	By: JAD
KUZZENS INC. PROCESSING PLANT PAINTER, VIRGINIA	MSA, P.C. 5033 Rouse Drive, Virginia Beach, VA. 23462 (757) 490-9264 (ofc) (757) 490-0634 (fax) www.msaonline.com Environmental Sciences + Planning + Surveying Engineering + Landscape Architecture			

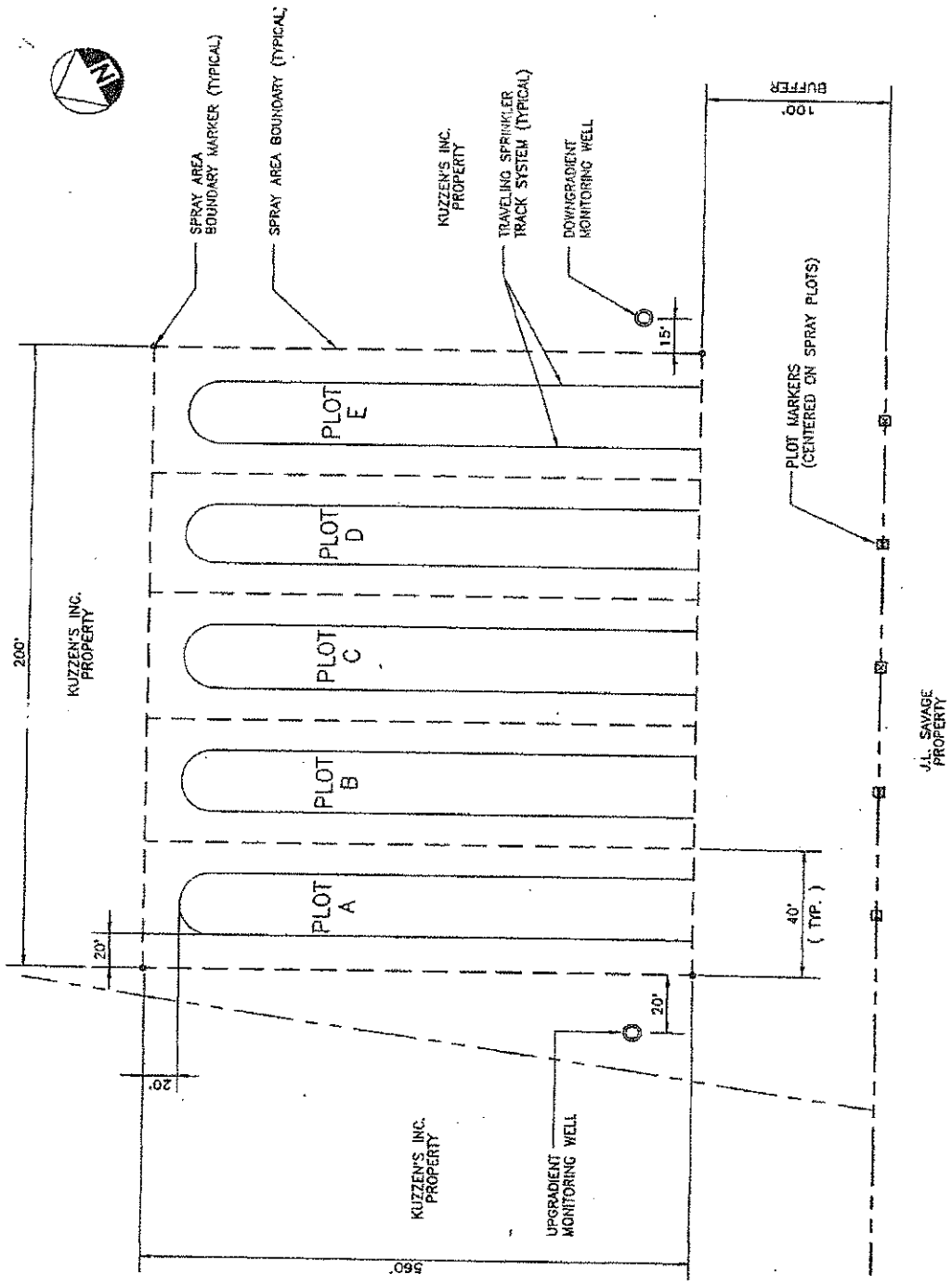

EXHIBIT D 2
LAND APPLICATION METHODS

KUZZENS INC. PROCESSING PLANT
PAINTER, VIRGINIA

MSA JOB #	DATE:	SCALE	By:
08719C	2/1/2012	NTS	DEQ

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0 250 500 1,000 1,500 Feet

Source: 2011 Aerial Photograph from USDA-NAIP, Accomack, VA

Note: This entire area is shown as in Flood Zone X on FEMA Flood Map 51001C0800F

N

EXHIBIT E SOIL TYPES	MSA JOB # 08719C	DATE: 12/6/2011	SCALE As shown	By: BRO
KUZZENS INC. PROCESSING PLANT PAINTER, VIRGINIA	MSA, P.C. 5033 Rouse Drive, Virginia Beach, VA. 23462 (757) 490-9264 (ofc) (757) 490-0634 (fax) www.msaonline.com Environmental Sciences + Planning + Surveying Engineering + Landscape Architecture			

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VPA 01047

Appendix I
Waste Water Monitoring Results

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
Eden, NC 27288
(336)623-8921

Pace Analytical Services, Inc.
2225 Riverside Dr.
Asheville, NC 28804
(828)254-7176

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: KUZZEN VPA
Pace Project No.: 92102360

Sample: 1047 **Lab ID: 92102360001** Collected: 09/13/11 12:20 Received: 09/14/11 15:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Copper, Dissolved	**511**	ug/L	5.0	1	09/15/11 16:10	09/16/11 14:46	7440-50-8	
Zinc, Dissolved	**89.1**	ug/L	10.0	1	09/15/11 16:10	09/16/11 14:46	7440-66-6	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Calcium	**142000**	ug/L	1000	10	09/19/11 10:25	09/20/11 16:02	7440-70-2	
Magnesium	**6570**	ug/L	100	1	09/19/11 10:25	09/19/11 22:25	7439-95-4	
Potassium	**28300**	ug/L	5000	1	09/19/11 10:25	09/19/11 22:25	7440-09-7	
Sodium	**58100**	ug/L	5000	1	09/19/11 10:25	09/20/11 15:39	7440-23-5	
120.1 Specific Conductance	Analytical Method: EPA 120.1							
Specific Conductance	**1160**	umhos/cm	10.0	1		09/17/11 15:00		N2
350.1 Ammonia	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.10	1		09/21/11 16:25	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**3.4**	mg/L	0.50	1		09/17/11 13:59	7727-37-9	M1
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**2.1**	mg/L	0.20	1		09/14/11 22:18		
Nitrogen, Nitrite	ND	mg/L	0.10	1		09/14/11 22:18		
Nitrogen, NO2 plus NO3	**2.1**	mg/L	0.20	1		09/14/11 22:18		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**2.2**	mg/L	0.050	1		09/17/11 09:57	7723-14-0	
4500 Chloride	Analytical Method: SM 4500-Cl-E							
Chloride	**296**	mg/L	50.0	10		09/18/11 12:19	16887-00-6	

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Appendix II
Agronomic Practices

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Appendix II
Agronomic Practices and Nutrient Management Plan

Appendix II
Agronomic Practices and Nutrient Management Plan

TURF MAINTENANCE

Tall fescue grass is maintained on the spray field. The grass cover provides uptake of nutrients in the spray water, increases evapotranspiration and thus disposal of the water. The grass also provides erosion and sediment control to keep soils onsite. The grass and grass root matt also increase the detention time of the spray water in the topsoils where natural processes attenuate nutrients. No specific yield is anticipated from the cover crop as such tissue testing is not required.

Table 1 provides a summary of field maintenance.

Activity	Spring (April)	Summer	Fall (September)	Winter
Soils Sampling	X		X	
Aeration	X			
pH Amendment	X		X	
Pesticide (Weed) Application	X			
Cutting	X	X	X	
Irrigation		X	X	
Fertilizing			X	
Thatching			X	
Reseeding			X	

Soils are tested bi-annually (in April and September). During the April sampling event the turf is evaluated with respect to weed coverage. When coverage exceeds 25%, weed control is prescribed in keeping with best management practices. Specific product will be determined based on plant materials found to be present. Application will be in keeping with product labeling and best management practices.

Application of wastewater and amendment requires the use of heavy equipment on the field. If compaction is observed aeration is best conducted in the spring.

The soil pH at land application site shall be adjusted upward with lime, and if necessary downward with elemental sulfur, to achieve and maintain a pH range approximating 5.8 – 6.5 S.U.

Soil amendment with gypsum (calcium sulfate) at the rate of 10 to 15 lbs. per 100 sq. ft. shall be made on the spray application site in the spring if the Exchangeable Sodium Percentage (ESP) in the soil is equal to or greater than 15.

During the September sampling event the turf is evaluated with respect to health, density and thatch.

- If turf health is found to be substandard, amendments may be prescribed according to recommendations provided by A&L Eastern Laboratories, Inc. located in Richmond, Virginia. Amendments shall be applied according to recommendations and best management practices. To prevent brown patch nitrogen fertilizers shall be kept to a minimum.
- If turf is found to lack sufficient density the field is reseeding as per recommendations for reseeding of established turfs.
- Generally it is not necessary to thatch fescue turf however if the thatch matt is found to be inhibiting water penetration thatching will be prescribed followed by reseeding at the specified rate for established turfs.

During the active growing season the turf is cut on a weekly basis to maintain a turf height of 2.5 - 4". Spray application is monitored to ensure adequate coverage. Consistent coverage and the prevention of wet spots along with management of nitrogen is the primary control for brown patch.

NUTRIENT MANAGEMENT PLAN

A nutrient management plan (NMP) is provided to ensure that nutrients amendments are sufficient to support reasonable yields without impacting adjacent waterways or groundwater. Relative to the subject site, nutrient amendment is not yield driven. Application rates are minimized to the level necessary to maintain turf health. Summary provisions include:

GENERAL:

Test soils for pH twice a year (April and September)

Test soils for phosphate and potassium once a year (September)

All crop (turf) nutrients shall be applied according to best management practices and timed in anticipation of turf demand.

Fertilizers are not to be applied to saturated ground.

pH amendments may be applied to frozen ground to prevent compaction of soils.

Split application of nitrogen fertilizer is advised to lessen environmental impact and to discourage development of brown patch disease.

Recycling of clippings is encouraged as an effective means of recycling nutrients.

UPDATE REQUIREMENTS:

The NMP should be modified if any of the following occurs:

- Change in crop.
- Land area is decreased.

MANURE HANDLING:

The subject facility is not an animal handling operation. Manure, generated elsewhere may not be stored onsite.

In the event that manure is utilized as a fertilizer the following will apply:

- Do not apply manure within 100' of a well, 50 feet from surface waters or 100 feet from a residence.
- Application should, when possible, be timed in anticipation of turf demand.
- Only apply when there is a low potential for run off.
- Incorporation of manure is suggested however due to the permanent nature of the cover crop, incorporation is not possible at the subject site.
- Spreading equipment shall be calibrated on a regular basis to ensure proper application rates.
- Reasonable efforts should be made to minimize odor during transport and application of manure.

ERROSION AND SEDIMENT CONTROL:

Best management practices should be utilized to minimize erosion and runoff. Advise on erosion, runoff and sediment controls can be obtained through the Eastern Shore Soil and Water Conservation District. The district's website is located at:

http://www.esswcd.org/

PHOSPHOROUS AMMEDMENTS:

Soils having phosphorous levels above the established threshold (FIV>150) will require a Phosphorous Site Index (PSI) to be performed prior to the application of additional phosphorous.

NITROGEN AMMENDMENTS:

Plant available nitrogen (PAN) was calculated as follows:

$$((\text{TKN-Ammonia}) * 0.3) + (\text{Ammonia} * 0.5) + \text{Nitrate}$$

The calculated PAN for 2011 was 11.48 lb/ac/yr and is well less than the recommended PAN for the crop (Fescue grass @ 150 lb/ac). If turf health is found to be substandard, amendments may be prescribed according to recommendations provided by A&L Eastern Laboratories, Inc. located in Richmond, Virginia. Amendments shall be applied according to best management practices and shall not exceed a total of 150 lb/ac/yr inclusive of PAN applied via the spent wash water.

RECORD KEEPING:

Records pertaining to nutrient amendment of the subject site shall be maintained for a period of 5 years. Records include but are not limited to:

- Record of timing location and acreage of all nutrient applications.

- Analysis of nutrient content of any fertilizer applied.
- Receipts related to nutrient purchase

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Appendix III
Technical Soil Descriptions

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BkA—Bojac sandy loam, 0 to 2 percent slopes

Setting

Landform: Stream terraces
Landscape position: Nearly level and undulating surfaces
Size of areas: 5 to 1,200 acres

Composition

Bojac and similar soils: 85 to 95 percent
Dissimilar inclusions: 5 to 15 percent

Inclusions

Dissimilar inclusions:
• Dragston soils, which have a grayer subsoil than the Bojac soil; on the rims of depressions, on flats, and in depressions
Similar soils:
• Soils that have about 2 to 15 percent gravel in the subsoil and about 5 to 50 percent gravel in the substratum; in landscape positions similar to those of the Bojac soil

Typical Profile

0 to 7 inches—brown sandy loam
7 to 27 inches—strong brown loam
27 to 33 inches—strong brown sandy loam
33 to 40 inches—strong brown loamy sand
40 to 85 inches—pale brown sand

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Low
Organic matter content: Low
Soil reaction: Extremely acid to slightly acid in the surface layer and subsoil, very strongly acid to moderately acid in the substratum
Natural fertility: Low
Surface runoff: Slow
Hazard of water erosion: Low
Hazard of wind erosion: Medium
Depth to water table: 48 to 72 inches
Root zone: More than 60 inches
Shrink-swell potential: Low
Corrosivity: To concrete—high; to steel—low

Use and Management

Cropland

Suitability for cultivated crops: Well suited
Suitability for nursery crops: Well suited (fig. 7)
Management concerns:
• Droughtiness, which can be overcome by applying irrigation water
• The hazard of wind erosion, which can be reduced by establishing windbreaks, leaving plant residue on the surface, and using a conservation tillage system
• Low content of organic matter, which can be increased by incorporating plant residue into the soil

Pasture

Suitability for grasses and legumes: Well suited
Management concerns:
• Droughtiness, which can be overcome by applying irrigation water

Woodland

Potential productivity for loblolly pine: High
Site index for loblolly pine: 80
Estimated annual production of loblolly pine: 115 cubic feet per acre
Management concerns:
• No major concerns

Septic tank absorption fields

Suitability: Well suited
• Seasonal wetness, which can be reduced by placing the absorption field above the high water table

Building sites

Suitability: Well suited
Management concerns:
• Sloughing, which can be prevented by shoring excavation walls
• Wetness, which can be reduced by installing a drainage system
• Droughtiness, which can be overcome by applying irrigation water

Recreational areas

Suitability: Well suited
Management concerns:
• No major concerns

Interpretive Groups

Land capability classification: IIs
Woodland ordination symbol: 8A

Bojac Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Parent material: Unconsolidated sediments
Slope range: 0 to 6 percent

Typical Pedon

Bojac sandy loam, 0 to 2 percent slopes, about 1.3 miles south-southeast of the junction of U.S. Highway 13 (business route) and Virginia Highway 605 and 1.5 miles south-southwest of the junction of U.S. Highway 13 (business route) and Virginia Highway 652, near Accomac:

Ap—0 to 7 inches; brown (10YR 4/3) sandy loam; weak medium granular structure; friable, slightly sticky and slightly plastic; few fine roots; strongly acid; abrupt smooth boundary.

Bt1—7 to 27 inches; strong brown (7.5YR 5/6) loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; many distinct clay bridges between sand grains; few faint clay films in pores; very strongly acid; gradual smooth boundary.

Bt2—27 to 33 inches; strong brown (7.5YR 5/6) sandy loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; many distinct clay bridges between sand grains; few faint clay films in pores; strongly acid; gradual smooth boundary.

Bt3—33 to 40 inches; strong brown (7.5YR 5/8) loamy sand; weak coarse subangular blocky structure; very friable; many distinct clay bridges between sand grains; strongly acid; gradual smooth boundary.

C—40 to 85 inches; pale brown (10YR 6/3) sand; single grain; loose; strongly acid.

Range in Characteristics

Thickness of the solum: 30 to 65 inches
Soil reaction: Extremely acid to slightly acid in the A, E, and Bt horizons, very strongly acid to moderately acid in the C horizon
Content of coarse fragments: 0 to 5 percent in the solum and 0 to 15 percent in the C horizon

A horizon (not in all pedons):
Hue—7.5YR to 2.5Y
Value—3 or 4
Chroma—1 to 3
Texture—loamy sand, loamy fine sand, sandy loam, fine sandy loam, or loam

Ap horizon:
Hue—7.5YR to 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—loamy sand, loamy fine sand, sandy loam, fine sandy loam, or loam

E horizon (not in all pedons):
Hue—10YR or 2.5Y
Value—4 to 7
Chroma—4 to 6
Texture—loamy sand, loamy fine sand, sandy loam, fine sandy loam, or loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 8
Texture—sandy loam, fine sandy loam, or loam
Other features—a thin subhorizon of sandy clay loam or clay loam in some pedons, a lower subhorizon of loamy sand or loamy fine sand in other pedons

C horizon:
Hue—7.5YR to 2.5Y
Value—4 to 7
Chroma—3 to 8
Other features—high-chroma mottles, low-chroma mottles, or both in many pedons
Texture—stratified coarse sand, sand, fine sand, loamy coarse sand, loamy sand, or loamy fine sand

Dragston Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately rapid in the subsoil, rapid in the substratum
Parent material: Unconsolidated sediments
Slope range: 0 to 2 percent

Typical Pedon

Dragston fine sandy loam, 0 to 2 percent slopes, about 0.7 mile south-southwest of the junction of Virginia Highways 693 and 793 and 1.2 miles north-northeast of the junction of Virginia Highways 692 and 693, near Hallwood:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; friable, slightly sticky and slightly plastic; common fine roots; very strongly acid; clear smooth boundary.

Bt—6 to 15 inches; light olive brown (2.5Y 5/6) loam; many medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; many distinct clay bridges between sand grains; few faint clay films in pores; very strongly acid; gradual smooth boundary.

Btg1—15 to 30 inches; gray (10YR 6/1) loam; many medium distinct yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; many distinct clay bridges between sand grains; few faint clay films in pores; very strongly acid; gradual smooth boundary.

Btg2—30 to 40 inches; gray (10YR 6/1) fine sandy loam; many medium distinct yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; many distinct clay bridges between sand grains; few faint clay films in pores; very strongly acid; gradual smooth boundary.

Cg—40 to 85 inches; light gray (10YR 7/2) fine sand; many medium distinct yellowish red (5YR 5/6) and brownish yellow (10YR 6/6) mottles; single grain; loose; very strongly acid.

Range in Characteristics

Thickness of the solum: 25 to 50 inches
Soil reaction: Very strongly acid or strongly acid in the Ap and Bt horizons, very strongly acid to slightly acid in the Btg and Cg horizons
Content of coarse fragments: 0 to 2 percent in the solum, 0 to 10 percent in the Cg horizon

A horizon (not in all pedons):
Hue—10YR to 5Y
Value—2 to 5
Chroma—1 to 4
Texture—loamy sand, loamy fine sand, sandy loam, fine sandy loam, or loam

Ap horizon:
Hue—10YR to 5Y
Value—2 to 5
Chroma—1 to 4
Texture—loamy sand, loamy fine sand, sandy loam, fine sandy loam, or loam

Bt horizon:
Hue—10YR to 5Y
Value—4 to 6
Chroma—3 to 8
Other features—high- and low-chroma mottles
Texture—sandy loam, fine sandy loam, or loam

Btg horizon:
Hue—10YR to 5Y or neutral
Value—4 to 6
Chroma—0 to 2
Other features—high- and low-chroma mottles
Texture—sandy loam, fine sandy loam, or loam

Cg horizon:
Hue—10YR to 5BG or neutral
Value—4 to 7
Chroma—0 to 2
Other features—high- and low-chroma mottles
Texture—sand, fine sand, loamy sand, or loamy fine sand

DrA—Dragston fine sandy loam, 0 to 2 percent slopes

Setting

Landform: Stream terraces
Landscape position: Rims of depressions, flats, and depressions
Size of areas: 5 to 150 acres

Composition

Dragston and similar soils: 85 to 95 percent
Dissimilar inclusions: 5 to 15 percent

Inclusions

Dissimilar inclusions:
- Arapahoe soils, which have a darker surface layer than the Dragston soil; on flats and in depressions
- Seabrook soils, which have a less developed subsoil than the Dragston soil; in nearly level, slightly elevated areas

Similar soils:
- Munden soils, which have a browner subsoil than the Dragston soil; in nearly level, slightly elevated areas
- Soils that have about 2 to 15 percent gravel in the subsoil and about 5 to 50 percent gravel in the substratum; in landscape positions similar to those of the Dragston soil

Typical Profile

0 to 6 inches—dark grayish brown fine sandy loam
6 to 15 inches—light olive brown loam that has light brownish gray and strong brown mottles
15 to 30 inches—gray loam that has yellowish red mottles
30 to 40 inches—gray fine sandy loam that has yellowish red mottles
40 to 85 inches—light gray fine sand that has yellowish red and brownish yellow mottles

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately rapid in the subsoil and rapid in the substratum
Available water capacity: Moderate
Organic matter content: Low
Soil reaction: Very strongly acid or strongly acid in the surface layer and the upper part of the subsoil, very strongly acid to slightly acid in the lower part of the subsoil and in the substratum
Surface runoff: Slow
Hazard of water erosion: Low
Hazard of wind erosion: Medium
Depth to water table: 12 to 30 inches
Root zone: More than 60 inches
Shrink-swell potential: Low
Corrosivity: To concrete—high; to steel—low

Use and Management

Cropland

Suitability for cultivated crops: Moderate
Suitability for nursery crops: Moderate
Management concerns:
- Wetness, which can be reduced by installing a drainage system
- Low content of organic matter, which can be increased by incorporating plant residue into the soil
- The hazard of wind erosion in drained areas, which can be reduced by establishing windbreaks, leaving plant residue on the surface, and using a conservation tillage system

Pasture

Suitability for grasses and legumes: Moderate
Management concerns:
- Wetness, which can be reduced by installing a drainage system

Woodland

Potential productivity for loblolly pine: Very high
Site index for loblolly pine: 86
Estimated annual production of loblolly pine: 123 cubic feet per acre
Management concerns:
- Wetness

Septic tank absorption fields

Suitability: Poor
Management concerns:
- Wetness, which can be reduced by providing a drainage system and placing the absorption field above the level of the seasonal high water table
- Poor filtering capacity, which can be overcome by increasing the size of the field

Building sites

Suitability: Poor
Management concerns:
- Wetness, which can be reduced by installing a drainage system
- Sloughing, which can be prevented by shoring excavation walls
- Droughtiness, which can be overcome by applying irrigation water

Recreational areas

Suitability: Poor
Management concerns:
- Wetness

Interpretive Groups

Land capability classification: IVw
Woodland ordination symbol: 9W

MuA—Munden sandy loam, 0 to 2 percent slopes

Setting

Landform: Coastal-plain uplands and stream terraces
Landscape position: Nearly level surfaces
Size of areas: 5 to 300 acres

Composition

Munden and similar soils: 85 to 95 percent
Dissimilar inclusions: 5 to 15 percent

Inclusions

Dissimilar inclusions:
• Nimmo soils, which have a grayer subsoil than the Munden soil; on flats and in depressions

Similar soils:
• Seabrook soils, which have a sandier subsoil than the Munden soil; in landscape positions similar to those of the Munden soil
• Soils that have about 5 to 35 percent gravel in the subsoil and substratum; in landscape positions similar to those of the Munden soil

Typical Profile

0 to 8 inches—dark grayish brown sandy loam
8 to 20 inches—yellowish brown loam
20 to 25 inches—yellowish brown sandy loam that has reddish yellow and pale brown mottles
25 to 40 inches—yellowish brown sandy loam that has reddish yellow and light gray mottles
40 to 55 inches—mottled pale brown and grayish brown loamy sand
55 to 85 inches—grayish brown fine sand

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderately rapid in the subsoil, moderately rapid or rapid in the substratum
Available water capacity: Low
Organic matter content: Low
Soil reaction: Very strongly acid to moderately acid
Natural fertility: Low
Surface runoff: Slow
Hazard of water erosion: Low
Hazard of wind erosion: High
Depth to water table: 18 to 30 inches
Root zone: More than 60 inches
Shrink-swell potential: Low
Corrosivity: To concrete—high; to steel—low

Use and Management

Cropland

Suitability for cultivated crops: Well suited
Suitability for nursery crops: Well suited (fig. 12)
Management concerns:
• Wetness early in the growing season, which can be reduced by installing a drainage system
• Droughtiness later in the growing season, which can be overcome by applying irrigation water
• Low content of organic matter, which can be increased by incorporating plant residue into the soil

Pasture

Suitability for grasses and legumes: Well suited
Management concerns:
• Wetness

Woodland

Potential productivity for loblolly pine: Very high
Site index for loblolly pine: 90
Estimated annual production of loblolly pine: 130 cubic feet per acre
Management concerns:
• Wetness

Septic tank absorption fields

Suitability: Moderate
Management concerns:
• Wetness, which can be reduced by placing the absorption field above the level of the seasonal high water table
• Poor filtering capacity, which can be overcome by increasing the size of the field

Building sites

Suitability: Well suited
Management concerns:
• Sloughing, which can be prevented by shoring excavation walls
• Wetness, which can be reduced by installing a drainage system
• Droughtiness, which can be overcome by applying irrigation water

Recreational areas

Suitability: Well suited
Management concerns:
• Wetness, droughtiness

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: 9W

Munden Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderately rapid in the subsoil, moderately rapid or rapid in the substratum
Parent material: Unconsolidated sediments
Slope range: 0 to 2 percent

Typical Pedon

Munden sandy loam, 0 to 2 percent slopes, 0.8 mile south-southeast of the junction of Virginia Highways 658 and 682 and 1.2 miles west-southwest of the junction of Virginia Highways 681 and 316, near Bloxom:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) sandy loam; weak medium granular structure; friable, slightly sticky and slightly plastic; common fine and medium roots; very strongly acid; clear smooth boundary.

Bt1—8 to 20 inches; yellowish brown (10YR 5/6) loam; common medium distinct reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; friable, sticky and slightly plastic; common fine and medium roots; many distinct clay bridges between sand grains; few faint clay films in pores; very strongly acid; gradual smooth boundary.

Bt2—20 to 25 inches; yellowish brown (10YR 5/6) sandy loam; common medium distinct reddish yellow (7.5YR 6/8) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable, sticky and slightly plastic; few fine roots; many distinct clay bridges between sand grains; few faint clay films in pores; very strongly acid; gradual smooth boundary.

Bt3—25 to 40 inches; yellowish brown (10YR 5/6) sandy loam; many medium distinct reddish yellow (7.5YR 6/8) and light gray (10YR 7/2) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; many distinct clay bridges between sand grains; few faint clay films in pores; very strongly acid; gradual smooth boundary.

C—40 to 55 inches; mottled pale brown (10YR 6/3) and grayish brown (10YR 5/2) loamy sand; single grain; loose; strongly acid; gradual smooth boundary.

Cg—55 to 85 inches; grayish brown (10YR 5/2) fine sand; single grain; loose; strongly acid.

Range in Characteristics

Thickness of the solum: 25 to 45 inches
Soil reaction: Very strongly acid to moderately acid
Content of coarse fragments: 0 to 5 percent

Ap horizon:
- Hue—10YR or 2.5Y
- Value—3 to 5
- Chroma—1 to 4
- Texture—loamy sand, loamy fine sand, sandy loam, fine sandy loam, or loam

Upper part of the Bt horizon:
- Hue—7.5YR to 2.5Y
- Value—3 to 6
- Chroma—4 to 8
- Texture—sandy loam, fine sandy loam, or loam

Lower part of the Bt horizon:
- Hue—7.5YR to 2.5Y
- Value—3 to 6
- Chroma—3 to 8
- Texture—sandy loam, fine sandy loam, or loam

Btg horizon (not in all pedons):
- Hue—7.5YR to 2.5Y or neutral
- Value—3 to 6
- Chroma—0 to 2
- Texture—sandy loam, fine sandy loam, or loam; subhorizons of sandy clay loam

C horizon:
- Hue—7.5YR to 5Y
- Value—5 to 7
- Chroma—3 to 8
- Other features—mottles that have chroma of 0 to 8
- Texture—sand, fine sand, loamy sand, loamy fine sand, sandy loam, or fine sandy loam

Cg horizon:
- Hue—7.5YR to 5Y or neutral
- Value—5 to 7
- Chroma—0 to 2
- Texture—sand, fine sand, loamy sand, loamy fine sand, sandy loam, or fine sandy loam

Kuzzens Incorporated
Painter, VA Processing Plant

VPA Permit Application
VPA 01047

Appendix IV
Soil Sample Results

(Pending)
REC 5/9/12

Report Number: 12-047-0666
Account Number: 45631

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A&L Eastern Laboratories, Inc.

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Send To: PACE ANALYTICAL SERVICES INC
9800 KINCEY AVENUE
SUITE 100
HUNTERSVILLE NC 28078

Grower:
KUZZENS VPA 08719C

Submitted By: BONNIE MCKEE
Farm ID:

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SOIL ANALYSIS REPORT

Analytical Method(s):
Mehlich 3

Date Received: 02/16/2012 **Date Of Analysis:** 02/17/2012 **Date Of Report:** 02/20/2012

Sample ID Field ID	Lab Number	Organic Matter			Phosphorus				Potassium		Magnesium		Calcium		Sodium		pH		Acidity	C.E.C
		%	Rate	ENR lbs/A	Mehlich 3 ppm	Rate	Reserve ppm	Rate	K ppm	Rate	Mg ppm	Rate	Ca ppm	Rate	Na ppm	Rate	Soil pH	Buffer Index	H meq/100g	meq/100g
B-1	05541	2.5	L	91	40 NC = 33	M			146 NC = 75	H	119	H	911	H	30	L	6.7	6.90	0.3	6.3
M-2	05542	1.9	L	81	71 NC = 59	H			122 NC = 62	H	94	H	677	M	30	L	6.6	6.90	0.3	4.9

Sample ID Field ID	Percent Base Saturation					Nitrate		Sulfur		Zinc		Manganese		Iron		Copper		Boron		Soluble Salts		Chloride		Aluminum
	K %	Mg %	Ca %	Na %	H %	NO_3N ppm	Rate	S ppm	Rate	Zn ppm	Rate	Mn ppm	Rate	Fe ppm	Rate	Cu ppm	Rate	B ppm	Rate	SS ms/cm	Rate	Cl ppm	Rate	Al ppm
B-1	5.9	15.7	72.3	2.1	4.5																			
M-2	6.4	16.0	69.1	2.7	5.9																			

Values on this report represent the plant available nutrients in the soil. Rating after each value: VL (Very Low), L (Low), M (Medium), H (High), VH (Very High). ENR - Estimated Nitrogen Release. C.E.C. - Cation Exchange Capacity.

Explanation of symbols: % (percent), ppm (parts per million), lbs/A (pounds per acre), ms/cm (milli-mhos per centimeter), meq/100g (milli-equivalent per 100 grams). Conversions: ppm x 2 = lbs/A, Soluble Salts ms/cm x 640 = ppm.

This report applies to sample(s) tested. Samples are retained a maximum of thirty days after testing.

Analysis prepared by: A&L Eastern Laboratories, Inc.

by: Pauric McGroary

Pauric McGroary

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ANALYTICAL RESULTS

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

Sample: Kuzzens B-1 **Lab ID: 92112127001** Collected: 02/10/12 12:00 Received: 02/14/12 15:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Cadmium	ND	mg/kg	0.087	1	02/16/12 14:25	02/17/12 22:13	7440-43-9	
Chromium	**6.4**	mg/kg	0.43	1	02/16/12 14:25	02/17/12 22:13	7440-47-3	
Copper	**9.3**	mg/kg	0.43	1	02/16/12 14:25	02/17/12 22:13	7440-50-8	
Lead	**12.7**	mg/kg	0.43	1	02/16/12 14:25	02/17/12 22:13	7439-92-1	
Manganese	**19.4**	mg/kg	0.43	1	02/16/12 14:25	02/17/12 22:13	7439-96-5	
Nickel	**2.2**	mg/kg	0.43	1	02/16/12 14:25	02/17/12 22:13	7440-02-0	
Zinc	**13.1**	mg/kg	0.87	1	02/16/12 14:25	02/17/12 22:13	7440-66-6	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**12.5**	%	0.10	1		02/15/12 15:13		
9045 pH Soil	Analytical Method: EPA 9045							
pH at 25 Degrees C	**6.6**	Std. Units	0.10	1		02/24/12 16:00		
Total Nitrogen Calculation	Analytical Method: 40CFR PART 432.2							
Nitrogen	**836**	mg/kg	40.0	1		02/28/12 16:43	7727-37-9	
Total Organic Nitrogen Soil	Analytical Method: TKN-NH3 Calculation							
Total Organic Nitrogen	**686**	mg/kg	40.0	1		02/29/12 12:22		
350.1 Ammonia	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**147**	mg/kg	5.4	1		02/28/12 15:15	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**833**	mg/kg	42.3	1		02/26/12 11:59	7727-37-9	
353.2 Nitrogen, NO2/NO3	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/kg	2.3	1		02/21/12 18:55		
Nitrogen, Nitrite	**1.3**	mg/kg	1.1	1		02/21/12 18:55		
Nitrogen, NO2 plus NO3	**2.5**	mg/kg	2.3	1		02/21/12 18:55		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**261**	mg/kg	15.4	5		02/27/12 17:47	7723-14-0	

Sample: Kuzzens M-2 **Lab ID: 92112127002** Collected: 02/10/12 13:00 Received: 02/14/12 15:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Cadmium	ND	mg/kg	0.10	1	02/16/12 14:25	02/17/12 22:17	7440-43-9	
Chromium	**8.5**	mg/kg	0.52	1	02/16/12 14:25	02/17/12 22:17	7440-47-3	
Copper	**8.7**	mg/kg	0.52	1	02/16/12 14:25	02/17/12 22:17	7440-50-8	

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ANALYTICAL RESULTS

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

Sample: Kuzzens M-2 **Lab ID: 92112127002** Collected: 02/10/12 13:00 Received: 02/14/12 15:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Lead	**8.5**	mg/kg	0.52	1	02/16/12 14:25	02/17/12 22:17	7439-92-1	
Manganese	**21.8**	mg/kg	0.52	1	02/16/12 14:25	02/17/12 22:17	7439-96-5	
Nickel	**2.1**	mg/kg	0.52	1	02/16/12 14:25	02/17/12 22:17	7440-02-0	
Zinc	**9.0**	mg/kg	1.0	1	02/16/12 14:25	02/17/12 22:17	7440-66-6	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**11.7**	%	0.10	1		02/15/12 15:14		
9045 pH Soil	Analytical Method: EPA 9045							
pH at 25 Degrees C	**6.5**	Std. Units	0.10	1		02/24/12 16:00		
Total Nitrogen Calculation	Analytical Method: 40CFR PART 432.2							
Nitrogen	**390**	mg/kg	40.0	1		02/28/12 16:43	7727-37-9	
Total Organic Nitrogen Soil	Analytical Method: TKN-NH3 Calculation							
Total Organic Nitrogen	**346**	mg/kg	40.0	1		02/29/12 12:22		
350.1 Ammonia	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**41.9**	mg/kg	7.7	1		02/28/12 15:16	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**388**	mg/kg	23.1	1		02/26/12 12:01	7727-37-9	
353.2 Nitrogen, NO2/NO3	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	ND	mg/kg	2.3	1		02/21/12 18:56		
Nitrogen, Nitrite	**2.8**	mg/kg	1.1	1		02/21/12 18:56		
Nitrogen, NO2 plus NO3	**2.5**	mg/kg	2.3	1		02/21/12 18:56		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**366**	mg/kg	16.2	5		02/27/12 17:48	7723-14-0	

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QUALITY CONTROL DATA

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

QC Batch: MPRP/9915 — Analysis Method: EPA 6010
QC Batch Method: EPA 3050 — Analysis Description: 6010 MET
Associated Lab Samples: 92112127001, 92112127002

METHOD BLANK: 722597 — Matrix: Solid
Associated Lab Samples: 92112127001, 92112127002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cadmium	mg/kg	ND	0.10	02/17/12 20:46	
Chromium	mg/kg	ND	0.50	02/17/12 20:46	
Copper	mg/kg	ND	0.50	02/17/12 20:46	
Lead	mg/kg	ND	0.50	02/17/12 20:46	
Manganese	mg/kg	ND	0.50	02/17/12 20:46	
Nickel	mg/kg	ND	0.50	02/17/12 20:46	
Zinc	mg/kg	ND	1.0	02/17/12 20:46	

LABORATORY CONTROL SAMPLE: 722598

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cadmium	mg/kg	50	51.1	102	80-120	
Chromium	mg/kg	50	50.5	101	80-120	
Copper	mg/kg	50	49.5	99	80-120	
Lead	mg/kg	50	50.3	101	80-120	
Manganese	mg/kg	50	48.6	97	80-120	
Nickel	mg/kg	50	50.7	101	80-120	
Zinc	mg/kg	50	50.3	101	80-120	

MATRIX SPIKE SAMPLE: 722599

Parameter	Units	92112042001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cadmium	mg/kg	ND	33.3	31.1	93	75-125	
Chromium	mg/kg	40.7 ug/g	33.3	73.9	100	75-125	
Copper	mg/kg	0.917 ug/g	33.3	32.5	95	75-125	
Lead	mg/kg	ND	33.3	28.5	85	75-125	
Manganese	mg/kg	1.89 ug/g	33.3	33.2	94	75-125	
Nickel	mg/kg	30.8 ug/g	33.3	61.0	91	75-125	
Zinc	mg/kg	ND	33.3	30.3	90	75-125	

SAMPLE DUPLICATE: 722600

Parameter	Units	92112042002 Result	Dup Result	RPD	Qualifiers
Cadmium	mg/kg	ND	ND		
Chromium	mg/kg	10.5 ug/g	10.5	0	
Copper	mg/kg	ND	.036J		
Lead	mg/kg	ND	ND		
Manganese	mg/kg	ND	.071J		

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REPORT OF LABORATORY ANALYSIS

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(704)875-9092

QUALITY CONTROL DATA

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

SAMPLE DUPLICATE: 722600

Parameter	Units	92112042002 Result	Dup Result	RPD	Qualifiers
Nickel	mg/kg	0.421 ug/g	0.40	4	
Zinc	mg/kg	ND	.49J		

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February 29, 2012

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Mr. Tony Dongarra
MSA, P.C.
5033 Rouse Dr
Virginia Beach, VA 23462

RE: Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

Dear Mr. Dongarra:
Enclosed are the analytical results for sample(s) received by the laboratory on February 14, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Bonnie McKee

Bonnie McKee

bonnie.mckee@pacelabs.com
Project Manager

Enclosures

cc: Ms. Jessica Wilson, MSA, P.C.

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CERTIFICATIONS

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

Charlotte Certification IDs
9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
South Carolina Drinking Water Cert. #: 99006003
Virginia Drinking Water Certification #: 00213
Connecticut Certification #: PH-0104
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Louisiana DHH Drinking Water # LA 100031
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460144

Asheville Certification IDs
2225 Riverside Dr., Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia Certification #: 00072
West Virginia Certification #: 356
Virgina/VELAP Certification #: 460147

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SAMPLE ANALYTE COUNT

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92112127001	**Kuzzens B-1**	EPA 6010	JDA	7	PASI-A
		ASTM D2974-87	KDF	1	PASI-C
		EPA 9045	EWS	1	PASI-A
		40CFR PART 432.2	EWS	1	PASI-A
		TKN-NH3 Calculation	EWS	1	PASI-A
		EPA 350.1	SDH	1	PASI-A
		EPA 351.2	JDA	1	PASI-A
		EPA 353.2	DMN	3	PASI-A
		EPA 365.1	JDA	1	PASI-A
92112127002	**Kuzzens M-2**	EPA 6010	JDA	7	PASI-A
		ASTM D2974-87	KDF	1	PASI-C
		EPA 9045	EWS	1	PASI-A
		40CFR PART 432.2	EWS	1	PASI-A
		TKN-NH3 Calculation	EWS	1	PASI-A
		EPA 350.1	SDH	1	PASI-A
		EPA 351.2	JDA	1	PASI-A
		EPA 353.2	DMN	3	PASI-A
		EPA 365.1	JDA	1	PASI-A

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QUALITY CONTROL DATA

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

QC Batch: PMST/4492
QC Batch Method: ASTM D2974-87
Analysis Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 92112127001, 92112127002

SAMPLE DUPLICATE: 721921

Parameter	Units	92112121001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	20.1	20.4	2	

SAMPLE DUPLICATE: 721922

Parameter	Units	92112127002 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	11.7	11.3	4	

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QUALITY CONTROL DATA

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

QC Batch: WET/19838
QC Batch Method: EPA 9045
Analysis Method: EPA 9045
Analysis Description: 9045 pH
Associated Lab Samples: 92112127001, 92112127002

SAMPLE DUPLICATE: 726202

Parameter	Units	92112032001 Result	Dup Result	RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.1	0	

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QUALITY CONTROL DATA

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

QC Batch: WETA/11635
QC Batch Method: EPA 350.1
Analysis Method: EPA 350.1
Analysis Description: 350.1 Ammonia
Associated Lab Samples: 92112127001, 92112127002

METHOD BLANK: 727687
Matrix: Solid
Associated Lab Samples: 92112127001, 92112127002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/kg	ND	2.0	02/29/12 18:33	

LABORATORY CONTROL SAMPLE: 727688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/kg	100	108	108	90-110	

MATRIX SPIKE SAMPLE: 727690

Parameter	Units	92111999002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/kg	2250	889	5290	117	90-110	M1

SAMPLE DUPLICATE: 727689

Parameter	Units	92111999002 Result	Dup Result	RPD	Qualifiers
Nitrogen, Ammonia	mg/kg	2250	4770	12	

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QUALITY CONTROL DATA

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

QC Batch: WETA/11627 — Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 — Analysis Description: 351.2 TKN
Associated Lab Samples: 92112127001, 92112127002

METHOD BLANK: 727567 — Matrix: Solid
Associated Lab Samples: 92112127001, 92112127002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/kg	ND	50.0	02/26/12 11:56	

LABORATORY CONTROL SAMPLE: 727568

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/kg	1000	1020	102	90-110	

MATRIX SPIKE SAMPLE: 727569

Parameter	Units	92111999002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/kg	14700	1570	44500	1076	90-110	M6

SAMPLE DUPLICATE: 727570

Parameter	Units	92112127001 Result	Dup Result	RPD	Qualifiers
Nitrogen, Kjeldahl, Total	mg/kg	833	762	9	

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QUALITY CONTROL DATA

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

QC Batch: WETA/11590 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite
Associated Lab Samples: 92112127001, 92112127002

METHOD BLANK: 725010 — Matrix: Solid
Associated Lab Samples: 92112127001, 92112127002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Nitrate	mg/kg	ND	2.0	02/21/12 18:47	
Nitrogen, Nitrite	mg/kg	ND	1.0	02/21/12 18:47	
Nitrogen, NO2 plus NO3	mg/kg	ND	2.0	02/21/12 18:47	

LABORATORY CONTROL SAMPLE: 725011

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/kg	50	51.0	102	90-110	
Nitrogen, Nitrite	mg/kg	10	10.4	104	90-110	
Nitrogen, NO2 plus NO3	mg/kg	50	51.0	102	90-110	

MATRIX SPIKE SAMPLE: 725012

Parameter	Units	92111999002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/kg	ND	91.2	88.3	97	90-110	
Nitrogen, Nitrite	mg/kg	7.1	18.8	22.6	49	90-110	
Nitrogen, NO2 plus NO3	mg/kg	ND	91.2	88.3	94	90-110	

SAMPLE DUPLICATE: 725013

Parameter	Units	92111999002 Result	Dup Result	RPD	Qualifiers
Nitrogen, Nitrate	mg/kg	ND	ND		
Nitrogen, Nitrite	mg/kg	7.1	9.2	37	D6
Nitrogen, NO2 plus NO3	mg/kg	ND	ND		

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QUALITY CONTROL DATA

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

QC Batch: WETA/11628 — Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 — Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92112127001, 92112127002

METHOD BLANK: 727643 — Matrix: Solid
Associated Lab Samples: 92112127001, 92112127002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/kg	ND	2.0	02/27/12 16:32	

LABORATORY CONTROL SAMPLE: 727644

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/kg	50	53.1	106	90-110	

MATRIX SPIKE SAMPLE: 727645

Parameter	Units	92111999002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/kg	5880	235	11300	79	90-110	M6

MATRIX SPIKE SAMPLE: 727647

Parameter	Units	92112401008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/kg	21.2	73.5	89.1	92	90-110	

SAMPLE DUPLICATE: 727646

Parameter	Units	92112127001 Result	Dup Result	RPD	Qualifiers
Phosphorus	mg/kg	261	220	17	

SAMPLE DUPLICATE: 727648

Parameter	Units	92112401009 Result	Dup Result	RPD	Qualifiers
Phosphorus	mg/kg	24.9	24.7	1	

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QUALIFIERS

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Acid preservation may not be appropriate for 2-Chloroethylvinyl ether, Styrene, and Vinyl chloride.

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LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Kuzzens VPA 08719C
Pace Project No.: 92112127

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92112127001	**Kuzzens B-1**	EPA 3050	MPRP/9915	EPA 6010	ICP/9137
92112127002	**Kuzzens M-2**	EPA 3050	MPRP/9915	EPA 6010	ICP/9137
92112127001	**Kuzzens B-1**	ASTM D2974-87	PMST/4492		
92112127002	**Kuzzens M-2**	ASTM D2974-87	PMST/4492		
92112127001	**Kuzzens B-1**	EPA 9045	WET/19838		
92112127002	**Kuzzens M-2**	EPA 9045	WET/19838		
92112127001	**Kuzzens B-1**	40CFR PART 432.2	WET/19894		
92112127002	**Kuzzens M-2**	40CFR PART 432.2	WET/19894		
92112127001	**Kuzzens B-1**	TKN-NH3 Calculation	WET/19896		
92112127002	**Kuzzens M-2**	TKN-NH3 Calculation	WET/19896		
92112127001	**Kuzzens B-1**	EPA 350.1	WETA/11635		
92112127002	**Kuzzens M-2**	EPA 350.1	WETA/11635		
92112127001	**Kuzzens B-1**	EPA 351.2	WETA/11627		
92112127002	**Kuzzens M-2**	EPA 351.2	WETA/11627		
92112127001	**Kuzzens B-1**	EPA 353.2	WETA/11590		
92112127002	**Kuzzens M-2**	EPA 353.2	WETA/11590		
92112127001	**Kuzzens B-1**	EPA 365.1	WETA/11628		
92112127002	**Kuzzens M-2**	EPA 365.1	WETA/11628		

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Kuzzens Incorporated
Painter, VA Processing Plant

VPA Permit Application
VPA 01047

Appendix V
Land Area Determination

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Appendix V
Land Area Determination

GENERAL:

Calculations are based on the following parameters:

- The subject spray field is 2.56 acres
- Primary soils are bojac series with a slope of 0 – 2 (bkA).
- The "crop" is a year round permanent stand of tall fescue.
- Soil analyses are expressed as dry weights in mg/kg. *Additional soil samples were collected on collected February 10, 2012 after notification of a monitoring waiver request status. As of 2/28/2012 MSA is awaiting monitoring results.*

VPA 01047

Available land	2.56
2011 total Flow	0.97 MG

Nitrogen Balance

	Results	*as mg/L*	Flow	*as Liters*	Loading
NH3	0.10	0.0001	968,700	3666928.39	0.37
TKN	3.4	0.0034	968,700	3666928.39	12.47
NO3	2.1	0.0021	968,700	3666928.39	7.70
NO2	0.1	0.0001	968,700	3666928.39	0.37

Total N Applied	sum of balance	20.90	
20% N loss through denitrification	sum X .2	4.18	
Available N	Total - loss	16.72	
Uptake for Fescue	ncsu pub	135.00	
Acres Required	available / uptake	**0.12**	**Acers**

Given application rates for N are well below the uptake potential of the cover crop leaching was not discussed.

Phosphorus Balance

	Results	*as mg/L*	Flow	*as Liters*	Loading	
P	2.20	0.0022	968,700	3666928.39	8.07	
Uptake for Fescue				ncsu pub	65.00	
Acres Required				available / uptake	**0.12**	**Acers**

Given application rates for P are well below the uptake potential of the cover crop leaching was not discussed.

Potasium Balance

	Results	*as mg/L*	Flow	*as Liters*	Loading	
K	28.30	0.0283	968,700	3666928.39	103.77	
Uptake for Fescue				ncsu pub	185.00	
Acres Required				available / uptake	**0.56**	**Acers**

questionable

Sulfur Balance

	Results	*as mg/L*	Flow	*as Liters*	Loading
Sulfate				0.00	0.00
Sulfur content					
Uptake for Fescue					
Residual					
Sulfate available for leaching					
Precipitation					
Evapotranspiration					
Exess Precipitation					
over 3.39 Acres					
wastewater applied					
Total					

Concentration of sulfate in leachate

Sulfur is not tested during routine monitoring of the facility wastewater. A request for a waiver for additional monitoring was granted by the VDEQ on 1/20/2012

Salt Balance

	Results	*as mg/L*	Flow	*as Liters*	Loading	mmol
Na	52.74	0.0527	968,700	3666928.39	193.39	8.40843
Ca	135.75	0.1358	968,700	3666928.39	497.79	24.8893
Mg	5.12	0.0051	968,700	3666928.39	18.77	1.56456
SAR	(Na/23)/(SQRT(0.5 X ((Ca/20)+(Mg/12))))				**1.21**	

Carbon / Nitrogen Balnce

TOC		
TKN		
C/N ratio	TOC / TKN	**#DIV/0!**

Note: As of 2/23/2012 *awaiting monitoring results*

LAND REQUIREMENTS FOR METALS

Copper	mg/L	*mg/Gal*	lb/Gal	*Flow*	Mass Applied	lb/Acre	
		0	0	968,700	0	0.00	
	Cumulative Limt (lb/acre)				*permit*	125	
	Land Needed				loading / limit	0.000	
	Site Life				lb/Acre/permit	**#DIV/0!**	**Years**
Zinc	mg/L	*mg/Gal*	lb/Gal	*Flow*	Mass Applied	lb/Acre	
		0	0	968,700	0	0.00	
	Cumulative Limt (lb/acre)				*permit*	250	
	Land Needed				loading / limit	0.000	
	Site Life				lb/Acre/permit	**#DIV/0!**	**Years**
Nickle *	mg/L	*mg/Gal*	lb/Gal	*Flow*	Mass Applied	lb/Acre	
		0	0	968,700	0	0.00	
	Cumulative Limt (lb/acre)				*permit*	125	
	Land Needed				loading / limit	0.000	
	Site Life				lb/Acre/permit	**#DIV/0!**	**Years**
Lead *	mg/L	*mg/Gal*	lb/Gal	*Flow*	Mass Applied	lb/Acre	
		0	0	968,700	0	0.00	
	Cumulative Limt (lb/acre)				*permit*	1000	
	Land Needed				loading / limit	0.000	
	Site Life				lb/Acre/permit	**#DIV/0!**	**Years**
Cadmium *	mg/L	*mg/Gal*	lb/Gal	*Flow*	Mass Applied	lb/Acre	
		0	0	968,700	0	0.00	
	Cumulative Limt (lb/acre)				*permit*	8.9	
	Land Needed				loading / limit	0.000	
	Site Life				lb/Acre/permit	**#DIV/0!**	**Years**

* Ni, Pb and Cd were not analysed during routine monitoring therefore historic data was utilized. These elements are not anticiapated in the waste stream. Data from the 2002 application renewal and a total flow of 500,000 gallons was utilized for these calculations.

Aresnic **	< 5 ug/L	(not a land limiting parameter)
Boron **	0.39 mg/L	(not a land limiting parameter)

** Arsenic and Boron were not analysed during routine monitoring therefore historic data was utilized. These elements are not anticiapated in the waste stream.

Smithson Jr., Robert (DEQ)

From: Tony Dongarra [Tony.Dongarra@msaonline.com]
Sent: Wednesday, May 09, 2012 3:44 PM
To: Smithson Jr., Robert (DEQ)
Cc: Jason Fulbright
Subject: Re: VPA 01047 submittals

Bob:

Those are set up as waste water calculations and would be provided once we do the additional monitoring at the start of operations. The years figure we provide here and on the annual reports are relative to that sample only. As far as actual compliance with the field life requirements for the main limiting elements (Copper and Zinc) go, the permittee has been monitoring twice monthly and submitting loading info for the entire permit period. These element of compliance should be subject to the cumulative amount of documented loading and not to calculation by any single sample be it waste water or soil sample results.

On Wed, May 9, 2012 at 3:07 PM, Smithson Jr., Robert (DEQ) <Robert.SmithsonJr@deq.virginia.gov> wrote:

Tony, You still need to revisit the page entitled "Land Requirements For Metals" (awaiting the lab results to complete the number of years site life left).

From: Tony Dongarra [mailto:Tony.Dongarra@msaonline.com]
Sent: Wednesday, May 09, 2012 1:36 PM
To: Smithson Jr., Robert (DEQ)
Cc: Jason Fulbright
Subject: VPA 01047 submittals

Bob:

Attached are two documents pursuant to the re-application the Kuzzens spray waste water operation. The first attachment is the long awaited soils results. I've had the Pace results for awhile but getting a hold of the results from A&L was the rub. Sorry for the delay. These should go in Appendix IV.

The second is a modified sheet two of the land requirements which has the Carbon / Nitrogen calculations. I elected to simply use the prior formula of TOC / TKN and took the liberty of calculating it for each soil type tested.

The other outstanding issue I'm aware of is the signature sheets. These should have been signed by Mr. Gerry Odell and forwarded directly to your office. I have e-copies on file here. If you don't have them let us know and we'll track them down for you.

MSA, P.C.

ENVIRONMENTAL SCIENCES, PLANNING, SURVEYING, & ENGINEERING

Kuzzens, Inc.

Chloride Loading: VPA# 01047

DATE:	GRID SCALE:	MSA JOB #:
2011	H: -- V: --	**08719C**

Table 1. Calculation of chloride loading to irrigation field.

Annual volume of wastewater applied to irrigation field (G)	968,700
Annual volume of wastewater applied to irrigation field (MG)	0.969
Area of irrigation field (ac)	2.56
Depth of wastewater applied (in)	13.9
Annual depth of precipitation (in)	38
Annual evapotranspiration (in)	32
Excess precipitation (in/yr)	6
Volume of excess precipitation over irrigation field (MG)	0.417
Chloride in wastewater July (mg/L)	284
Chloride in wastewater August (mg/L)	282
Chloride in wastewater September (mg/L)	281
Chloride in wastewater October (mg/L)	285
Average concentration of wastewater chloride for season (mg/L)	282.9
Chloride applied to irrigation field (lbs/ac/yr)	1086
Total chloride applied to irrigation field (lbs/yr)	2781
Chloride available for plant uptake (lbs)	0
Chloride load to irrigation field (lbs/yr)	2781
Chloride in leachate(mg/L)	240.32
Dilution rate of wastewater chloride	15%

Kuzzens Incorporated
Painter, VA Processing Plant

VPA Permit Application
VPA 01047

Appendix VII
Waiver Request

Robert.SmithsonJr@deq.virginia.gov

Kuzzens - VPA01047- Dec. 23, 2011 Request For Monitori Parameters

Inbox x

Smithson Jr., Robert (DEQ) Robert.SmithsonJr@deq.virginia.gov
to Tony

Tony, as per our discussion today, we are granting your request for waivir VPA01047 reissuance
application purposes, as well as for waiving soil particle size analysis. Al sampled with data submitted with the application.

Let me know if you have questions.

Click here to Reply or Forward

MSA, P.C.
5033 Rouse Drive, Virginia Beach, VA 23462-3708 • (757) 490-9264 • (757) 490-0634 [fax] • www.msaonline.com
Offices in Hampton Roads and Virginia's Eastern Shore
Environmental Sciences • Planning • Surveying • Civil & Environmental Engineering • Landscape Architecture

December 23, 2001

Mr. Bob Smithson
VPA Program
Virginia Department of Environmental Quality
5636 Southern Boulevard
Virginia Beach, VA 23462

RE: VPA Application
Virginia Pollution Abatement Permit VPA01047
Kuzzens Inc. Painter, VA Packing Plant
MSA Project #08719C

Dear Mr. Smithson,

MSA is formally requesting a waiver from the monitoring requirements identified in the Virginia Pollution Abatement renewal application of the subject permitted facility.

The facility is a basic operation where groundwater is heated and chlorinated to facilitate the washing and packaging of agricultural products. In this case tomatoes are the sole product processed. The VPA permit covers the land disposal of spent wash water and limits application to ensure that the spent wash water does not migrate off site.

Given the nature of the spray operation waivers for several of the monitoring parameters listed on the permit application are requested. Waiver requests for parameters listed on Form C section 4.a. of the application, along with justifications for the effluent stream are listed in Table I.

Table I Effluent Stream Monitoring

Parameter	Wavier Rational
BOD mg/L	Generally associated with high concentrations of nitrogen where biological activity would create a high O2 demand. Is of a particular concern if being discharged to surface waters. The effluent stream does not have high levels of nutrients and in not surface water applied.
COD mg/L	Generally associated with the concentration of industrial chemicals that would create a high O2 demand. Is of a particular concern if being discharged to surface waters. The effluent stream is not industrial in nature and is not discharged to surface waters.
TOC mg/L	The amount of organic carbon in the effluent stream is not reasonable expected to be at a level that would negatively impact non-aquatic environments.
TSS mg/L	Solids in the effluent stream are not apparent. Given the nature of the spray operations any solids present are not expected to reach and impact surface waters.
Percent Solids (%)	Not anticipated to be a factor.

Kuzzens Incorporated
Painter, VA Processing Plant

VPA Permit Application
VPA 01047

Appendix VII
References

Appendix VI
References

File Copy 2009 VPA 01044 DMR

Evapotranspiration Methodology and Worksheet

Soil Facts - NCSU.edu pub.

ATTACHMENT C-1a
DEPARTMENT OF ENVIRONMENTAL QUALITY
Virginia Pollution Abatement Monitoring Report

Facility Name: Kuzzens Incorporated
Address: 3769 Grapeland Circle
Exmore, VA 23350

VPA Permit No.: VPA01047 **Annual Report, All values are Calculated based on previously submitted reports**

Report Period: From 1 / 1 /2011 To 12/ 31 /2011

Monitoring Station: **Spray Irrigation Wastewater From Storage Tank**

Parameters	Units		Monitoring Results Average	Monitoring Results Maximum	Frequency of Analysis	Sample Type
Available Phosphorus	#/acre	Reported	0.93	2.96	*2/Month*	*Calculated*
		Required	NL	NL	2/Month	Calculated
Available Potassium	mg/l	Reported	24.05	29.10	*2/Month*	*Grab*
		Required	NL	NL	2/Month	Grab
Available Potassium	#/acre	Reported	9.90	28.14	*2/Month*	*Calculated*
		Required	NL	NL	2/Month	Calculated
Calcium	mg/l	Reported	135.75	152.00	*2/Month*	*Grab*
		Required	NL	NL	2/Month	Grab
Magnesium	mg/l	Reported	5.12	8.20	*2/Month*	*Grab*
		Required	NL	NL	2/Month	Grab
Electro-Conduct (EC)	dS/m	Reported	1127.13	1320.00	*2/Month*	*Grab*
		Required	NL	NL*	2/Month	Grab
Dissolved Copper	ug/l	Reported	604.25	882.00	*2/Month*	*Grab*
		Required	NL	NL	2/Month	Grab
Dissolved Zinc	ug/l	Reported	72.83	137.00	*2/Month*	*Grab*
		Required	NL	NL	2/Month	Grab
PAN	#/acre	Reported		2.09	*1/Month*	*Calculated*
		Required	NA	Attch C*	1/Month	Calculated
PAN	#/acre /year	Reported		11.48	*1/Year*	*Calculated*
		Required	NA	Attch C*	1/Year	Calculated
Sodium	mg/l	Reported	52.74	59.80	*2/Month*	*Grab*
		Required	NL	NL	2/Month	Grab
SAR	meq/l	Reported	1.20	1.32	*2/Month*	*Calculated*
		Required	NL	NL	2/Month	Calculated
Pesticide Scan (608) Freeboard	ug/l	Reported	*Attach pages*	*Attach pages*	*1/year*	*Grab*
		Required	NA	NL	1/year	Grab

Name of Principal Exec. Officer or Authorized Agent / Title

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. See 18 U.S.C. ?1001 and 33 U.S.C. ?1319. (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)

Signature of Principal Officer or Authorized Agent / Date

ATTACHMENT C-1a
DEPARTMENT OF ENVIRONMENTAL QUALITY
Virginia Pollution Abatement Monitoring Report

Facility Name: Kuzzens Incorporated
Address: 3769 Grapeland Circle
Exmore, VA 23350

VPA Permit No.: VPA01047 **Annual Report, All values are Calculated based on previously submitted reports**

Report Period: From 1 / 1 /2011 To 12 31 /2011

Monitoring Station: **Spray Irrigation Wastewater From Storage Tank**

Parameters	Units		Monitoring Results Average	Monitoring Results Maximum	Analysis Frequency	Sample Type
Flow	MGD	Reported	0.0174	0.0175	*1/Day*	*Measured*
		Required	NL	NL	1/Day	Measured
Total Vol. Applied	MG	Reported		0.9687	*Monthly*	*Calculated*
		Required	*****	NL	Monthly	Calculated
Application Rate	in/day	Reported		0.25	*1/App. Day*	*Measured*
		Required	*****	1.0	1/App. Day	Measured
Application Rate	in/wk.	Reported		1.71	*1/Week*	*Measured*
		Required	*****	2.0	1/Week	Measured
PH	S.U.	Reported	6.61	7.05	*2/Month*	*Grab*
		Required	6.0 min	9.0	2/Month	Grab
Chlorides	mg/l	Reported	282.88	343.00	*2/Month*	*Grab*
		Required	NL	NL	2/Month	Grab
TKN	mg/l	Reported	3.90	8.40	*2/Month*	*Grab*
		Required	NL	NL	2/Month	Grab
TKN	#/acre	Reported	1.33	2.94	*2/Month*	*Calculated*
		Required	NL	NL	2/Month	Calculated
Nitrate-Nitrogen	mg/l	Reported	1.67	2.10	*2/Month*	*Grab*
		Required	NL	NL	2/Month	Grab
Nitrate-Nitrogen	#/acre	Reported	0.65	1.76	*2/Month*	*Calculated*
		Required	NL	NL	2/Month	Calculated
Ammonia-Nitrogen	mg/l	Reported	0.15	0.29	*2/Month*	*Grab*
		Required	NL	NL	2/Month	Grab
Ammonia-Nitrogen	#/acre	Reported	0.05	0.12	*2/Month*	*Calculated*
		Required	NL	NL	2/Month	Calculated
Available Phosphorus	mg/l	Reported	2.31	3.10	*2/Month*	*Grab*
		Required	NL	NL	2/Month	Grab

Name of Principal Exec. Officer or Authorized Agent / Title

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. See 18 U.S.C. ?1001 and 33 U.S.C. ?1319. (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)

Signature of Principal Officer or Authorized Agent / Date

EVAPOTRANSPIRATION

The combined water losses from evaporation and vegetative transpiration are termed evapotranspiration (ET). Evaporation is relatively easy to measure using evaporative pan data, however transpiration is difficult to quantify without direct field measurements. Actual ET losses from a site are most readily estimated through calculation. The thickness (relative depth) of soil water loss through ET can, however, be empirically determined. When this thickness is multiplied by an area, a volume of water loss may be calculated.

Thornthwaith (1948) developed a relationship for monthly potential evapotranspiration (PET) based on an a heat index and empirical coefficients for available sunshine and crop transpiration. Braas (1990) simplified the equation to:

$$PET = 1.62b \times [10T/I]^a$$

where, b is an adjustment factor for daily available sunshine, T is the mean monthly temperature (°C), I is the annual heat index, and a is a relative parameter based on I.

The Thornthwaite approach assumes that the soil water available for ET is not limited. Therefore, this calculation yields potential evapotranspiration (PET) which is an estimation of a <u>maximum</u> thickness of soil water loss.

Results of the PET calculations estimate the monthly relative thickness of water loss. These monthly thicknesses were multiplied by the area of the YYYYYY (Z.ZZ ac,ft²) and the resultant volumes added together to calculate the approximate annual volume of its' evapotranspirative losses. The total estimated annual volume of water loss through PET at YYYYYYY YYYYYYY is ZZ.ZZ gal/ft². A data listing and monthly breakdown of PET quantities is provided *******.

Braas, R.L., 1990. <u>Hydrology: an introduction to hydrologic science</u>. New York: Addison-Wesley Publishing Company. pp 224-225.

Thornthwaite, C.W., 1948. An approach toward a rational classification of climate. *Am. Geogr. Rev.* 38:55-94

POTENTIAL EVAPOTRANSPIRATION CALCULATIONS
[Thornthwaite, 1948]

Month	Air Temp (Avg °C/Day)	Sunshine Factor [b]	P.E.T. (cm)	Heat Index (by month)
JAN	2	0.86	0.19	0.25
FEB	4	0.84	0.56	0.71
MAR	10	1.03	2.96	2.85
APR	13	1.1	4.80	4.23
MAY	16	1.22	7.42	5.79
JUN	23	1.23	13.35	10.02
JUL	24.4	1.25	14.91	10.95
AUG	25.5	1.17	14.97	11.71
SEP	15.5	1.035	5.98	5.52
OCT	22	0.965	9.76	9.37
NOV	14	0.85	4.18	4.73
DEC	12	0.83	3.19	3.75
Annual Potential Evapotranspiration =			**82.26**	69.89 = ANNUAL HEAT INDEX

$PET = 1.62b \ [10T/I]^a$

b = sunshine factor [mean possible hours of bright sunlight (30days/12hrs)]
T = mean monthly air temperature (°C)
I = annual Heat Index
a = empirical coefficient

Air Temp = Average daily temperature at Melfa, Virginia over the last 9 years.

cm to inch ocnversion (X/2.54)	
JUL	5.87
AUG	5.90
SEP	2.36
Total	14.12

Kuzzens Incorporated
Painter, VA Processing Plant

VPA Permit Application
VPA 01047

Appendix VIII
Cull Disposal

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Tidewater Regional
Office

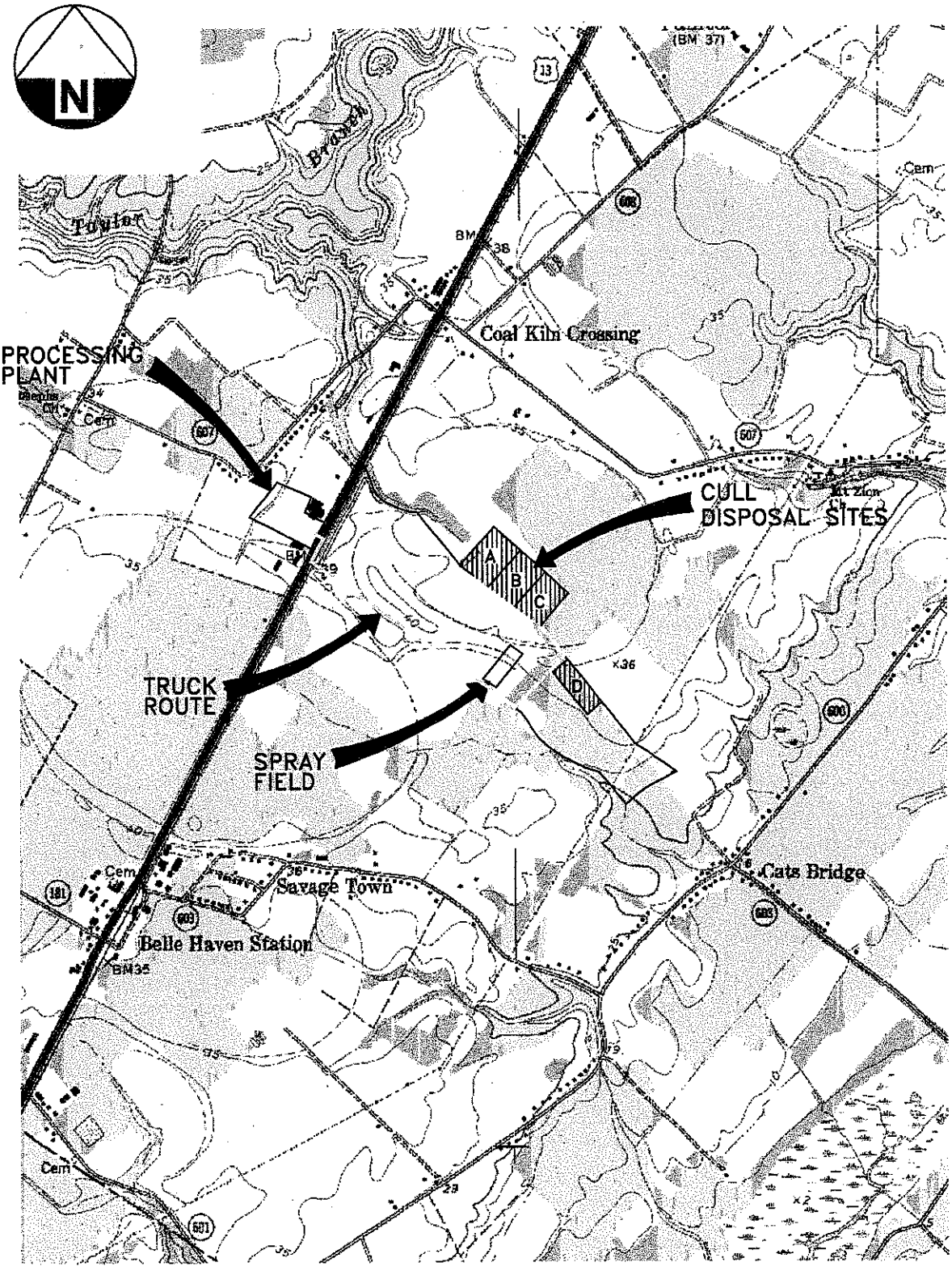
Cull Disposal

Culls are defined as product that is not fit for wholesale distribution. Product is determined to be a cull when its size falls outside of certain criteria (either to large or too small, is physically defective (malformed or ruptured) or is over ripe for packaging.

Culls are separated from marketable product after the wash process which effectively removes or reduces trace pesticides. Culls are conveyed to a spreader truck to one of 4 "cull fields" that are identified on Exhibit C. Total acreage is 25.8 acres inclusive of 50 food buffer strips that are maintained around the perimeter of each field. Field use is rotated as they become full.

A mechanical spreader ruptures the fruit to facilitate dehydration and decomposition once applied. Typically the partially dehydrated and decomposed fruits are further worked into the receiving soils via mechanical disc in the soils within 48 hours of applications.

Cull application is generally conducted from July – October. Off season, the fields are planted with either rye or oat grasses to provide both stabilization and nutrient uptake.
In 2011 a total of 2048 tons of culls were incorporated into the cull fields this was a low average application year.



SCALE: 1" = 2000'

cabe 255-004 MARCH 2002 255A	LOCATION MAP	EXHIBIT 11

Kuzzens Incorporated
Painter, VA Processing Plant

VPA Permit Application
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Appendix IX

Land Application

Land Application

The spay field is divided into five (5) equal sections identified as plots A – E on Exhibit D 2. To further ensure that the spray water is maintained no site each lot is provided with a 20 foot buffer where spray operations are not conducted.

Spent wash water is transferred from the main storage tank to a 3500 gallon tanker equipped with a PTO driven pump. The tanker is hauled to the spray field via a farm tractor and sequentially applied to each plot to ensure adequate time for infiltration.

Application rates are adjusted by speed (gear and RPM) of the tractor and are calibrated annually via the use of rain gauges.

VPA 01047

Available land	2.56
2011 total Flow	0.97 MG

Nitrogen Balance

	mg/L	*as %*	Flow	*as Liters*	Loading	
NH3	0.10	0.0001	968,700	3666928.39	0.37	kg
TKN	3.4	0.0034	968,700	3666928.39	12.47	kg
NO3	2.1	0.0021	968,700	3666928.39	7.70	kg
NO2	0.1	0.0001	968,700	3666928.39	0.37	kg

Total N Applied in lbs	sum of balance	45.98	lb
20% N loss through denitrification	sum X 0.2	9.20	lb
Available N	Total - loss	36.79	lb
N Uptake by Fescue	ncsu pub	135.00	lb/acre
Acres Required for N uptake		**0.27**	**Acres**

Given application rates for N are well below the uptake potential of the cover crop leaching was not discussed.

Phosphorus Balance

	mg/L	*as %*	Flow	*as Liters*	Loading	
P	2.20	0.0022	968,700	3666928.39	8.07	kg
					17.75	lb
Uptake for Fescue				ncsu pub	65.00	lb
Acres Required				available / uptake	**0.27**	**Acres**

Given application rates for P are well below the uptake potential of the cover crop leaching was not discussed.

Potasium Balance

	mg/L	*as %*	Flow	*as Liters*	Loading	
K	28.30	0.0283	968,700	3666928.39	103.77	kg
					228.30	lb
Uptake for Fescue				ncsu pub	185.00	lb/acre
Acres Required				available / uptake	**1.23**	**Acers**

Sulfur Balance

	mg/L	*as %*	Flow	*as Liters*	Loading
Sulfate				0.00	0.00
Sulfur content					
Uptake for Fescue					
Residual					
Sulfate available for leaching					
Precipitation					
Evapotranspiration					
Exess Precipitation					
over 3.39 Acres					
wastewater applied					
Total					

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MAY 09 2012
Tidewater Regional Office

Concentration of sulfate in leachate

Sulfur is not tested during routine monitoring of the facility wastewater. A request for a waiver for additional monitoring was granted by the VDEQ on 1/20/2012

Salt Balance

	mg/L	*as %*	Flow	*as Liters*	Loading	mmol
Na	52.74	0.0527	968,700	3666928.39	193.39	8.408426233
Ca	135.75	0.1358	968,700	3666928.39	497.79	24.88927646
Mg	5.12	0.0051	968,700	3666928.39	18.77	1.564556114

SAR (Na/23)/(SQRT(0.5 X ((Ca/20)+(Mg/12)))) **1.21**

Carbon / Nitrogen Balnce *Bojac*

	mg/L	as %		
TOC		2.5		
TKN	833	0.833		
C/N ratio		3.00	TOC / TKN	**3:1**

Carbon / Nitrogen Balnce *Munden*

	mg/L	as %		
TOC		1.9		
TKN	388	0.388		
C/N ratio		4.90	TOC / TKN	**4.9:1**

LAND REQUIREMENTS FOR METALS

Copper	mg/L	*mg/Gal*	lb/Gal	*Flow*	Mass Applied	lb/Acre	
		0	0	968,700	0	0.00	
	Cumulative Limt (lb/acre)				*permit*	125	
	Land Needed				loading / limit	0.000	
	Site Life				lb/Acre/permit	**#DIV/0!**	**Years**
Zinc	mg/L	*mg/Gal*	lb/Gal	*Flow*	Mass Applied	lb/Acre	
		0	0	968,700	0	0.00	
	Cumulative Limt (lb/acre)				*permit*	250	
	Land Needed				loading / limit	0.000	
	Site Life				lb/Acre/permit	**#DIV/0!**	**Years**
Nickle *	mg/L	*mg/Gal*	lb/Gal	*Flow*	Mass Applied	lb/Acre	
		0	0	968,700	0	0.00	
	Cumulative Limt (lb/acre)				*permit*	125	
	Land Needed				loading / limit	0.000	
	Site Life				lb/Acre/permit	**#DIV/0!**	**Years**
Lead *	mg/L	*mg/Gal*	lb/Gal	*Flow*	Mass Applied	lb/Acre	
		0	0	968,700	0	0.00	
	Cumulative Limt (lb/acre)				*permit*	1000	
	Land Needed				loading / limit	0.000	
	Site Life				lb/Acre/permit	**#DIV/0!**	**Years**
Cadmium	mg/L	*mg/Gal*	lb/Gal	*Flow*	Mass Applied	lb/Acre	
		0	0	968,700	0	0.00	
	Cumulative Limt (lb/acre)				*permit*	8.9	
	Land Needed				loading / limit	0.000	
	Site Life				lb/Acre/permit	**#DIV/0!**	**Years**

* Ni, Pb and Cd were not analysed during routine monitoring therefore historic data was utilized. These elements are not anticiapated in the waste stream. Data from the 2002 application renewal and a total flow of 500,000 gallons was utilized for these calculations.

Aresnic ** < 5 ug/L (not a land limiting parameter)

Boron ** 0.39 mg/L (not a land limiting parameter)

** Arsenic and Boron were not analysed during routine monitoring therefore historic data was utilized. These elements are not anticiapated in the waste stream.