RENERGY

Farmer:	Edgen
Site ID:	MOQ-05-05
First Year of Application	2016

Date of Application	
Season	Date
2016	4/17/2016

Facility Name:	Emerald BioEnergy
NPDES #:	41N00204*AD
NANI Month/Year:	May-16

	Concentration (mg/kg) Dry Weight Basis	Concentration (lb/1000 gal) Liquid Application Basis	Pollutant Concentrations (monthly average limits) mg/kg	Ceiling Concentrations (maximum sample limits) mg/kg
Arsenic	2.7	0.0015	41	75
Cadmium	0.6	0.0003	39	85
Copper	290	0.1620	1500	4300
Lead	14	0.0078	300	840
Mercury	0.82	0.0005	17	57
Molybdenum	10	0.0056	N/A	75
Nickel	20	0.0112	420	420
Selenium	2	0.0011	100	100
Zinc	630	0.3520	2800	7500
Total Kjeldahl Nitrogen	92,537	51.7078	N/A	N/A
Ammonia Nitrogen	62,687	35.0282	N/A	N/A
Total Phosphorus	31,343	17.5138	N/A	N/A
Total Potassium	11,000	6.1466	N/A	N/A
Total Solids	6.70%	3.74383E-05		

Ton Conversion Factor	0.0005
Specific Weight (lb/gal)	8.34
Conversion to lb/ton	0.002
Conversion to lb/1000 gal	**0.000559**

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	Input (ppm)	lbs/1000 gal
TKN	92,537	***51.7***
Ammonia	62,687	***35.0***
Phosphorus	71,462	***39.9***
Potassium	13,200	***7.4***

Ton Conversion Factor	0.0005
Specific Weight (lb/gal)	8.34
Conversion to lb/ton	0.002
Percent Solids	6.70%
Conversion to lb/1000 gal	**0.000559**

Site Acreage:	13
Target Application Rate (gal/Acre)	10,000
Total Gallons Applied	132,000
Actual Application Rate (gal/Acre)	10,000
PAN (lbs/acre)	**400.32**
P (lbs/acre)	**399.32**
K (lbs/acre)	**73.76**
Total Dry Tons	**36.9**
Dry Ton per Acre	**2.8**

Plant Available Nitrogen

	lb/1000 gal
TKN	51.7
Ammonia	35.0
Organic	16.7

Surface Application*	
	lb/1000 gal
Ammonia	17.5
Organic**	5.0
PAN	**22.5**

*Assume 50% of Ammonia volatilizes during surface application

**Assume 30% of Organic Nitrogen is available for plant uptake

Injection***	
	lb/1000 gal
Ammonia	35.0
Organic	5.0
PAN	**40.0**

***For calculations assume 100% of ammonia is available for plant uptake. After application actual availability will be evaluated based on material's exposure to atmosphere after injection.

Estimation of availability will be no less than 85%.

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Arsenic	2.7	0.0015
Cadmium	0.6	0.0003
Copper	290	0.1620
Lead	14	0.0078
Mercury	0.82	0.0005
Molybdenum	10	0.0056
Nickel	20	0.0112
Selenium	2	0.0011
Zinc	630	0.3520
Total Solids	6.70%	

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Specific Weight (lb/gal)	8.34
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Conversion to lb/1000 gal	**0.000559**

	Metals Loading lb/acre	Federal Site Lifetime Limits (lb/Acre)	Estimated Site Lifetime (years)
Arsenic	0.015	36.6	2426
Cadmium	0.003	34.8	10380
Copper	1.620	1338.6	826
Lead	0.078	267.7	3422
Mercury	0.005	15.2	3317
Molybdenum	0.056	16.1	288
Nickel	0.112	374.8	3354
Selenium	0.011	89.2	7982
Zinc	3.520	2498.7	710

OEPA Applied Annual Metals Loading Records

Year of Application	Season of Application	NANI Used	Applied Arsenic (lbs/ac)	Applied Cadmium (lbs/ac)	Applied Copper (lbs/ac)	Applied Lead (lbs/ac)	Applied Mercury (lbs/ac)	Applied Molybdenum (lbs/ac)	Applied Nickel (lbs/ac)	Applied Selenium (lbs/ac)	Applied Zinc (lbs/ac)
2016	Spring	May	0.015	0.003	1.620	0.078	0.005	0.056	0.112	0.011	3.520
2017											
2018											
2019											
2020											
2021											
2022											
2023											
2024											
2025											
To Date Metals Loading Sum (lbs/ac):			0.015	0.003	1.620	0.078	0.005	0.056	0.112	0.011	3.520
Remaining Metals Loading Capacity (lbs/ac):			36.585	34.797	1336.980	267.622	15.195	16.044	374.688	89.189	2495.180
Cummulative Metals Limit (lbs/ac):			36.60	34.80	1338.60	267.70	15.20	16.10	374.80	89.20	2498.70
Estimated Site Lifetime (Years):			2439	11599	825	3431	3039	287	3345	8108	709

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	lbs/ac	$/ac	Total Savings
PAN	400.32	$ 220.18	$ 2,906.33
P2O5	399.32	$ 239.59	$ 3,162.58
K2O	73.76	$ 44.26	$ 584.17

Site Acreage	13.2
Savings per Acre	**$ 504.02**
Overall Savings	**$ 6,653.08**

Assumptions and Constants

$ per pound of N = $0.55
$ per pound of P = $0.60
$ per pound of K = $0.60