RENERGY

Farmer:	
Site ID:	MOQ-05-09a
First Year of Application	2017

Date of Application	
Season	Date
2017	4/13/2017
	4/14/2017
	4/15/2017

Facility Name:	Emerald BioEnergy
NPDES #:	4IN00204*AD
NANI Month/Year:	April-17

	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	10	0.0055	41	75
Cadmium	2	0.0011	39	85
Copper	282	0.1550	1500	4300
Lead	7	0.0038	300	840
Mercury	0.03	0.0000	17	57
Molybdenum	1	0.0005	N/A	75
Nickel	15	0.0082	420	420
Selenium	2	0.0011	100	100
Zinc	458	0.2517	2800	7500
Total Kjeldahl Nitrogen	103,000	56.6094	N/A	N/A
Ammonia Nitrogen	58,700	32.2619	N/A	N/A
Total Phosphorus	34,400	18.9064	N/A	N/A
Total Potassium	13,700	7.5296	N/A	N/A
Total Solids	6.59%			

Ton Conversion Factor	0.0005
Specific Weight (lb/gal)	8.34
Conversion to lb/ton	0.002
Conversion to lb/1000 gal	**0.000550**

Farmer:	0	Facility Name:	Emerald BioEnergy
Site ID:	MOQ-05-09a	NPDES #:	4IN00204*AD
First Year of Application	2017	NANI Month/Year:	April-17

	Input (ppm)	lbs/1000 gal
TKN	103,000	***56.6***
Ammonia	58,700	***32.3***
Phosphorus	78,432	***43.1***
Potassium	16,440	***9.0***

Ton Conversion Factor	0.0005
Specific Weight (lb/gal)	8.34
Conversion to lb/ton	0.002
Percent Solids	6.59%
Conversion to lb/1000 gal	**0.000550**

Site Acreage:	51
Target Application Rate (gal/Acre)	10,000
Total Gallons Applied	540,769
Actual Application Rate (gal/Acre)	10,603
PAN (lbs/acre)	**419.53**
P (lbs/acre)	**457.07**
K (lbs/acre)	**95.81**
Total Dry Tons	**148.6**
Dry Ton per Acre	**2.9**

Plant Available Nitrogen

	lb/1000 gal
TKN	56.6
Ammonia	32.3
Organic	24.3

Surface Application*	
	lb/1000 gal
Ammonia	16.1
Organic**	7.3
PAN	**23.4**

*Assume 50% of Ammonia volatilizes during surface application

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

Injection***	
	lb/1000 gal
Ammonia	32.3
Organic	7.3
PAN	**39.6**

***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%.

Farmer:	0	Facility Name:	Emerald BioEnergy
Site ID:	MOQ-05-09a	NPDES #:	4IN00204*AD
First Year of Application	2017	NANI Month/Year:	November-16

Site Acreage:	51
Target Application Rate (gal/Acre)	10,000
Total Gallons Applied	540,769
Actual Application Rate (gal/Acre)	10,603

	Concentration (mg/kg) Dry Weight Basis	Concentration (lb/1000 gal) Liquid Application Basis
Arsenic	10	0.0055
Cadmium	2	0.0011
Copper	282	0.1550
Lead	7	0.0038
Mercury	0.03	0.0000
Molybdenum	1	0.0005
Nickel	15	0.0082
Selenium	2	0.0011
Zinc	458	0.2517
Total Solids	6.59%	

Ton Conversion Factor	0.0005
Specific Weight (lb/gal)	8.34
Conversion to lb/ton	0.002
Conversion to lb/1000 gal	**0.000550**

	Metals Loading lb/acre	Federal Site Lifetime Limits (lb/Acre)	Estimated Site Lifetime (years)
Arsenic	0.058	36.6	628
Cadmium	0.012	34.8	2986
Copper	1.643	1338.6	815
Lead	0.041	267.7	6562
Mercury	0.000	15.2	86942
Molybdenum	0.006	16.1	2763
Nickel	0.087	374.8	4288
Selenium	0.012	89.2	7653
Zinc	2.669	2498.7	936

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											
2017	Spring	April	0.023	0.005	0.652	0.016	0.000	0.002	0.035	0.005	1.059
2018											
2019											
2020											
2021											
2022											
2023											
2024											
2025											
To Date Metals Loading Sum (lbs/ac):			0.023	0.005	0.652	0.016	0.000	0.002	0.035	0.005	1.059
Remaining Metals Loading Capacity (lbs/ac):			36.577	34.795	1337.948	267.684	15.200	16.098	374.765	89.195	2497.641
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):			1582	7523	2052	16535	219082	6961	10803	19284	#DIV/0!

Farmer:	0	Facility Name:	Emerald BioEnergy
Site ID:	MOQ-05-09a	NPDES #:	4IN00204*AD
First Year of Application	2017	NANI Month/Year:	April-17

	lbs/ac	$/ac	Total Savings
PAN	419.53	$ 230.74	$ 6,968.43
P2O5	457.07	$ 274.24	$ 8,282.18
K2O	95.81	$ 57.48	$ 1,736.01

Site Acreage	30.2
Savings per Acre	**$ 562.47**
Overall Savings	**$ 16,986.62**

Assumptions and Constants

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