RENERGY

Farmer:	Parson #2/4
Site ID:	MOQ-09-03
First Year of Application	2014

Date of Application	
Season	Date
2014	12/11/2014

Facility Name:	Emerald BioEnergy
NPDES #:	4IN00204*AD
NANI Month/Year:	December-14

	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	3	0.0015	41	75
Cadmium	1	0.0005	39	85
Copper	310	0.1520	1500	4300
Lead	17	0.0083	300	840
Mercury	0.24	0.0001	17	57
Molybdenum	21	0.0103	N/A	75
Nickel	22	0.0108	420	420
Selenium	2	0.0010	100	100
Zinc	652	0.3197	2800	7500
Total Kjeldahl Nitrogen	99,973	49.0260	N/A	N/A
Ammonia Nitrogen	40,701	19.9594	N/A	N/A
Total Phosphorus	29,614	14.5225	N/A	N/A
Total Potassium	8,586	4.2105	N/A	N/A
Total Solids	5.88%			

Ton Conversion Factor	0.0005
Specific Weight (lb/gal)	8.34
Conversion to lb/ton	0.002
Conversion to lb/1000 gal	**0.000490**

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	Input (ppm)	lbs/1000 gal
TKN	99,973	***49.0***
Ammonia	40,701	***20.0***
Phosphorus	67,520	***33.1***
Potassium	10,303	***5.1***

Ton Conversion Factor	0.0005
Specific Weight (lb/gal)	8.34
Conversion to lb/ton	0.002
Percent Solids	5.88%
Conversion to lb/1000 gal	**0.000490**

Site Acreage:	15
Target Application Rate (gal/Acre)	10,000
Total Gallons Applied	156,000
Actual Application Rate (gal/Acre)	10,729
PAN (lbs/acre)	**307.70**
P (lbs/acre)	**355.25**
K (lbs/acre)	**54.21**
Total Dry Tons	**38.3**
Dry Ton per Acre	**2.6**

Plant Available Nitrogen

	lb/1000 gal
TKN	49.0
Ammonia	20.0
Organic	29.1

Surface Application*	
	lb/1000 gal
Ammonia	10.0
Organic**	8.7
PAN	**18.7**

*Assume 50% of Ammonia volatilizes during surface application

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

Injection***	
	lb/1000 gal
Ammonia	20.0
Organic	8.7
PAN	**28.7**

***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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Site Acreage:	15
Target Application Rate (gal/Acre)	10,000
Total Gallons Applied	156,000
Actual Application Rate (gal/Acre)	10,729

	Concentration (mg/kg) Dry Weight Basis	Concentration (lb/1000 gal) Liquid Application Basis
Arsenic	3	0.0015
Cadmium	1	0.0005
Copper	310	0.1520
Lead	17	0.0083
Mercury	0.24	0.0001
Molybdenum	21	0.0103
Nickel	22	0.0108
Selenium	2	0.0010
Zinc	652	0.3197
Total Solids	5.88%	

Ton Conversion Factor	0.0005
Specific Weight (lb/gal)	8.34
Conversion to lb/ton	0.002
Conversion to lb/1000 gal	**0.000490**

	Metals Loading lb/acre	Federal Site Lifetime Limits (lb/Acre)	Estimated Site Lifetime (years)
Arsenic	0.016	36.6	2319
Cadmium	0.005	34.8	6614
Copper	1.631	1338.6	821
Lead	0.089	267.7	2993
Mercury	0.001	15.2	12037
Molybdenum	0.110	16.1	146
Nickel	0.116	374.8	3238
Selenium	0.011	89.2	8477
Zinc	3.430	2498.7	728

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)
2014	Fall	December-14	0.016	0.005	1.631	0.089	0.001	0.110	0.116	0.011	3.430
2015											
2016											
2017											
2018											
2019											
2020											
2021											
2022											
2023											
To Date Metals Loading Sum (lbs/ac):			0.016	0.005	1.631	0.089	0.001	0.110	0.116	0.011	3.430
Remaining Metals Loading Capacity (lbs/ac):			36.584	34.795	1336.969	267.611	15.199	15.990	374.684	89.189	2495.270
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):			2318	6613	820	2992	12036	145	3237	8476	727

Farmer:	Parson #2/4	Facility Name:	Emerald BioEnergy
Site ID:	MOQ-09-03	NPDES #:	4IN00204*AD
First Year of Application	2014	NANI Month/Year:	March-14

	lbs/ac	$/ac	Total Savings
PAN	307.70	$ 169.24	$ 5,110.93
P2O5	355.25	$ 213.15	$ 6,437.15
K2O	54.21	$ 32.53	$ 982.28

Site Acreage	30.2
Savings per Acre	**$ 414.91**
Overall Savings	**$ 12,530.36**

Assumptions and Constants

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