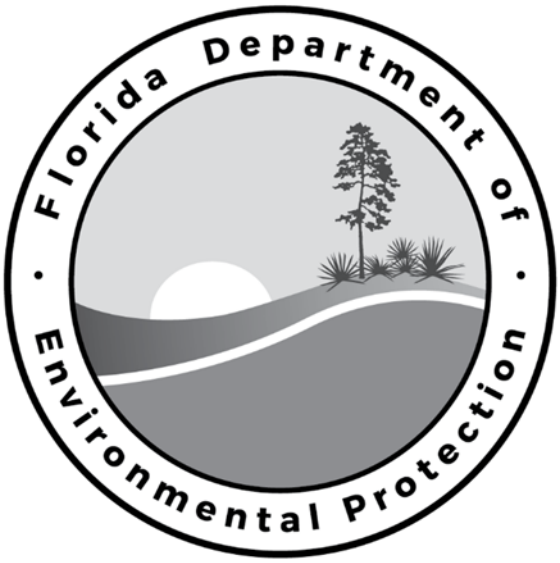


Effluent Quality Assessment of

Hastings R/O Water Treatment Plant

St. Johns County

NPDES # FL0169226

Sampled September 12, 2016

February 2017

Biology Program

DEP Laboratory

Division of Environmental Assessment and Restoration

DEP Laboratory Quality Manual

NELAC Certification No. E31780

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Hastings R/O WTP, 102 South Dancy Avenue, Hastings, St. Johns County, Florida, 32145. NPDES #FL0169226.

Facility Overview

Hastings R/O WTP (water treatment plant) is a facility which uses reverse osmosis membrane technology to produce drinking water. See Appendix A for a description of the facility, summary of permit limits, Administrative Order (AO) and Discharge Monitoring Report (DMR) information.

Methods

Effluent grab samples for toxicity testing, biological and chemical analyses were collected on September 12, 2016. All samples were collected from the EFF-1 NPDES sampling point for Outfall 001 Deep Creek by Patrick O'Connor (DEP Northeast Regional Operation Center) following DEP-SOP-001/01 FS 2400 Wastewater Sampling (see Appendix B).

The 96-hour acute definitive toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_01, TA07_02, and TA08_01 through TA08_09 (see Appendix B).

All field and laboratory methods followed DEP Standard Operating Procedures (see http://www.dep.state.fl.us/labs/library/lab_sops.htm and http://www.dep.state.fl.us/water/sas/sop/sops.htm for details) and met DEP quality assurance/quality control standards (see http://www.dep.state.fl.us/water/sas/qa/index.htm). Explanations of specific methods and measurements can be found in Appendix C.

Results

Chemistry Results (See Table 1, Table 2, Table 3 and Appendix C)

- Receiving waters for this facility fall within the Peninsular Nutrient Watershed Region for Numeric Nutrient Criteria (NNC). This FYI event can only provide single sample results; therefore, compliance should be determined with additional sampling events.
  http://ca.dep.state.fl.us/mapdirect/?focus=nutrientcriteria
- The total ammonia concentration in the grab sample collected and preserved for chemical analysis was 0.93 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was <0.02 mg/L.
- Alkalinity, arsenic, copper, fluoride, radium 226 + 228 and turbidity were detected in the effluent at levels that comply with Class III Freshwater Quality Criteria (62-302.530, F.A.C.) and/or permitted limits. Carbonaceous biochemical oxygen demand (CBOD), total chromium and total suspended solids were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). The effluent's conductivity, 5,600 µmhos-cm, exceeded the facility's permitted limit (≤ 5,089 µmhos-cm).

Algal Growth Potential (AGP) (See Table 4 and Appendix C)

- The effluent AGP was 49.9 mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum.* The analytical chemistry suggests that the effluent is nitrogen phosphorus co-limited (Miller et al. 1978).
- The effluent AGP result is greater than the AGP range (6.10 to 20.0 mg dry wt/L) suggested to be representative of high productivity for freshwater (Miller et al. 1978).

- An aliquot of the AGP sample was salinity adjusted from an apparent salinity of approximately 2.93 parts per thousand (ppth) to a salinity of approximately 7.01 ppth by the addition of artificial sea salts to meet the salinity requirements of the test species.
- The salinity adjusted effluent AGP was 8.24 A mg dry wt/L of the saltwater species *Dunaliella tertiolecta.*

- Toxicity Test Results (See Appendix C)
  - Tests were performed September 13 through 17, 2016.

Ceriodaphnia dubia 96-hour acute definitive bioassay – Lethal Concentration 50% mortality (LC_{50}) is 74.2%, 85%* mortality in 100% sample at 96 hours

Pimephales promelas 96-hour acute definitive bioassay – Lethal Concentration 50% mortality (LC_{50}) is > 100%, 2.5%* mortality in 100% sample at 96 hours

*NOTE: In a 96-hour acute definitive test of 100% effluent, mortality of <20% provides confidence that the effluent meets the acute toxicity criterion of Florida's Surface Water Quality Standards (Rule 62-302.500 (1) (a) 4, F.A.C.). Mortality between 20-50% indicates low to moderate levels of toxicity, and further action may be required. Mortality of >50% indicates that the effluent fails to meet the minimum requirement to discharge to waters of the state (Rule 62-4.244(3) (a), F.A.C.).

- The bioassay samples were acutely toxic to the *Ceriodaphnia dubia* test organisms, but did not show toxicity to the *Pimephales promelas* test organisms. The noted toxicity did not exceed the facility's permitted limit for acute toxicity of ≥ 20% effluent.

Conclusion

The effluent sample collected from the EFF-1 NPDES sampling point for this facility on September 12, 2016, was acutely toxic to the *Ceriodaphnia dubia* test organisms but did not show toxicity to the *Pimephales promelas* test organisms during the 96-hour acute definitive bioassays. The noted toxicity did not exceed the facility's permitted limit for acute toxicity of LC_{50} ≥ 20% effluent. The effluent AGP result is greater than the AGP range (6.10 to 20.0 mg dry wt/L) suggested to be representative of high productivity for freshwater. The effluent's specific conductance exceeded the facility's permitted limit. Additional effluent water quality samples collected on September 12, 2016, did not exceed any applicable water quality standards or any permit conditions.

For additional information concerning this sampling event, including bioassay bench sheets and SRT data, please contact Amelia.Rankin@dep.state.fl.us and/or Joseph.Faircloth@dep.state.fl.us.

Literature Cited

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. EPA-600/9-78-018. U. S. EPA, Cincinnati, Ohio. 126 p.

Maloney, T. E., W. E. Miller, and D. T. Specht. 1974. The Marine Algal Assay Procedure: Bottle Test. National Environmental Research Center Office of Research and Development. U. S. EPA, Corvallis, Oregon. 43 p.

USEPA. 2002. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 5th edition. EPA-821-R-02-012.

Table 1. Effluent limits, Class III Freshwater Criteria and field parameters.

Hastings R/O WTP	Units	Class III Criteria	Effluent Permit Limits	Hastings RO Final Eff.
Sample Depth	m	-	-	0.3
Temperature	°C	-	Report	24.7
pH	SU	6.0 - 8.5	6.0 - 8.5 s	7.6
Specific Conductance	µmhos/cm	≤ 1,275	≤ 5,089 s	5,600 [1]
Salinity	ppth	-	-	3 c
Dissolved Oxygen	% saturation	≥ 34	-	78.4
Dissolved Oxygen	mg/L	-	≥ 5.0 s	6.4
Flow	MGD	-	≤ 0.087	0.021
Total Residual Chlorine	mg/L	≤ 0.01	-	≤ 0.03 [2]

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

1 - Value exceeds the Class III Water Quality Criteria or permit limits

c - Value is calculated

s - Single sample

2 - measurement taken in the DEP laboratory

Table 2. Effluent limits, Class III Freshwater Criteria and analytical water chemistry data

Hastings R/O WTP	Units	Class III Criteria	Effluent Permit Limits	Hastings RO Final Eff.
Ortho-phosphate	mg P/L	-	-	0.026
Total Phosphorus	mg P/L	-	Report	0.12
Total Ammonia	mg N/L	-	Report	0.93
Un-ionized Ammonia	mg/L	≤ 0.02 s	≤ 0.16 s	< 0.02 c
Nitrate and Nitrite	mg N/L	-	-	0.17
Total Kjeldahl Nitrogen	mg N/L	-	-	1.3
Organic Nitrogen	mg N/L	-	-	0.4 c
Total Nitrogen	mg N/L	-	Report	1.5 c
Total Organic Carbon	mg C/L	-	-	4.3
Chlorophyll *a* - Corrected	µg/L	-	-	0.55 U
Phaeophytin	µg/L	-	-	0.40 U
CBOD, 5-day, N - inhibited	mg/L	-	≤ 5.0 s	0.58 IJ
Total Suspended Solids	mg/L	-	≤ 5.0 s	2 I
Turbidity	NTU	< 29 ts	-	0.20
Color (true)	PCU	-	-	6.3
Alkalinity	mg CaCO3/L	≥ 20 s	-	265
Chloride	mg Cl/L	-	-	780
Fluoride	mg F/L	≤ 10.0 s	-	1.3
Sulfate	mg SO4/L	-	-	2200
Alpha, Total	pCi/L	≤ 15 s	≤ 43.7 s	37.6 U
Alpha-Counting Error	pCi/L	-	-	24.5
Radium 226	pCi/L	≤ 15	-	6.96
Radium 226-Counting Error	pCi/L	-	-	0.387
Radium 228	pCi/L	-	-	0.748
Radium 228-Counting Error	pCi/L	-	-	0.326
Radium 226 + 228	pCi/L	≤ 5 s	≤ 12.2 s	7.71 c
Toxicity (acute definitive, LC50 % Effluent)				
Bioassay - Water flea *(Ceriodaphnia dubia)*	% effluent	≥ 100 s	≥ 20 s	74.2
Bioassay - Fish (*Pimephales promelas*)	% effluent	≥ 100 s	≥ 20 s	> 100

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.
c - Value is calculated
s - Single sample
t - Shall not exceed 29 NTUs above background
U - Material analyzed for but not detected; value reported is the method detection limit
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J - Estimated value

Table 3. Effluent limits, Class III Freshwater Criteria and analytical metals data

Hastings R/O WTP	Units	Class III Criteria	Effluent Permit Limits	Hastings RO Final Eff.
Hardness	mg CaCO3/L	-	-	3020 c
Aluminum	µg/L	-	-	2.0 U
Arsenic	µg/L	≤ 50	-	0.42
Cadmium	µg/L	≤ 0.756 b	-	0.020 U
Calcium	mg/L	-	-	618
Chromium, Total [3]	µg/L	≤ 268 b	-	0.053 I
Copper	µg/L	≤ 30.5 b	-	3.16
Iron	µg/L	≤ 1,000	-	30 U
Lead	µg/L	≤ 18.6 b	-	0.050 U
Magnesium	mg/L	-	-	359
Nickel	µg/L	≤ 169 b	-	0.050 U
Potassium	mg/L	-	-	16.2
Selenium	µg/L	≤ 5.0	-	0.20 U
Silver	µg/L	≤ 0.07	≤ 0.286 s	0.0050 U
Sodium	mg/L	-	-	380
Zinc	µg/L	≤ 388 b	-	5.0 U

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.
3 - Class III Freshwater Quality Criterion (62-302.530(19)(a), F.A.C.) is for chromium-III
b - Value is calculated based on hardness, (62-302.530(3))
c - Value is calculated
s - Single sample
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
U - Material analyzed for but not detected; value reported is the method detection limit

Table 4. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), ortho-phosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation and ratios of nitrogen to phosphorus

Hastings R/O WTP								
Location	**Test Species**	**AGP (measured)**	**Predicted AGP (TSIN) ± 20%**	**Predicted AGP (OP) ± 20%**	**Predicted AGP (TN) ± 20%**	**Predicted AGP (TP) ± 20%**	**Inorganic N:P ratio**	**Total N:P ratio**
Hastings RO Final Eff.	*Dunaliella tertiolecta*	8.24 A *	not applicable [4]	not applicable [4]	not applicable[4]	not applicable [4]	42.3	12.3
Hastings RO Final Eff.	*Pseudokirchneriella subcapitata*	49.9 A	41.8 ± 8.4	11.2 ± 2.2	55.9 ± 11.2	51.6 ± 10.3	42.3	12.3

Freshwater species *Pseudokirchneriella subcapitata*

Saltwater species *Dunaliella tertiolecta*

* - sample salinity adjusted to 7.01 ppth

4 - predictions not applicable to marine matrix

A - Value reported is the mean of two or more determinations

Appendix A

Facility Summary

State of Florida

Department of Environmental Protection

Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Ed Jamro & Sally Logan	Contact Number: 256-1671 & 256-1634
Facility Name (as it appears on permit): Hastings R/O WTP – Reject Concentrate	Former Names: NA
NPDES Permit Number: FL0169226	Permit Expiration Date: September 6, 2017
Physical Address: 102 South Dancy Avenue Hastings, Florida 32145	
District: Northeast	County: St. Johns
Function of Facility: The permit is for the operation of an existing demineralization concentrate (reject water) treatment and disposal system. The concentrate is generated at the water treatment plant that uses reverse osmosis membrane technology to produce drinking water.	
Facility Type: Industrial Wastewater	Permitted Capacity (MGD): 0.087
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): 0.021 MGD – July 2015 thru June 2016	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): N/A	
Description of type of Discharge: ☒ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify:	
Description of Sampling Location(s) - actual permit designation of permitted sampling point(s): EFF-1 - Sample point outfall 001 Deep Creek	
Description of Permitted Outfall(s): An existing 0.087 MGD Daily Maximum Flow permitted discharge to Deep Creek, Class III Fresh Waters, (WBID# 2549) which is 4 inches in diameter, approximately 20 feet in length, discharges at a depth of approximately 3.25 feet above the bottom of Deep Creek, and is located at about latitude 29° 43' 45" N, longitude 81° 29' 15" W.	
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): The Reverse osmosis unit is the treatment system for potable water. The concentrate generated from this process is the discharge covered under this permit.	

PART I: Continued										
List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under (Leave cell blank if not applicable)										
			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Chronic Whole Effluent Toxicity, 7-Day IC25 (*Ceriodaphnia dubia* & *Pimephales promelas*)	percent	Min				20	Bi-annually	Grab	EFF-1	See I.A.5 on page 6
Flow	MGD	Max Max		Report		0.087	Continuous	Meter	FLW-1	
pH	s.u.	Min Max				6.0 8.5	Daily; 24 hours	Grab	EFF-1	
Oxygen, Dissolved (DO)	mg/L	Min				5.0	Daily; 24 hours	Grab	EFF-1	
Temperature (ºF), Water	Deg F	Max				Report	Quarterly	Grab	EFF-1	
Nitrogen, Ammonia, Total (as N)	mg/L	Max				Report	Quarterly	Grab	EFF-1	
Nitrogen, Ammonia, Total unionized (as N)	mg/L	Max				0.16	Quarterly	Calculated	CAL-1	See I.A.3 on page 4
BOD, Carbonaceous 5-day, 20ºC	mg/L	Max Max	5.0			Report	Quarterly	Grab	EFF-1	
Solids, Total Suspended	mg/L	Max Max	5.0			Report	Quarterly	Grab	EFF-1	
Nitrogen, Total	mg/L	Max Max	3.0			Report	Quarterly	Grab	EFF-1	
Phosphorus, Total (as P)	mg/L	Max Max	1.0			Report	Quarterly	Grab	EFF-1	
Specific Conductance	umhos/cm	Max				5089.0	Quarterly	Grab	EFF-1	See I.A.3 on page 4

Radium 226 + Radium 228, Total	pCi/L	Max				12.2	Quarterly	Grab	EFF-1	See I.A.3 on page 4
Alpha, Gross Particle Activity	pCi/L	Max				43.7	Quarterly	Grab	EFF-1	See I.A.3 on page 4
Silver, Total Recoverable	µg/L	Max				0.286	Quarterly	Grab	EFF-1	See I.A.3 on page 4

PART I: Continued

Receiving Waters:	Classification (indicate whether fresh or marine):
Deep Creek	Class III Fresh Waters, (WBID# 2549)

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):
See page 6 of this report for toxicity requirements contained in the permit.

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):
NONE - NA

Facility Mixing Zone Details (if applicable): The mixing zones are shown below: Reference permit section I.A.3

Parameter	Mixing Zone Size
Un-ionized Ammonia	Radius of 10.0 feet
Specific Conductance	Radius of 5.0 feet
Combined Radium 226+228	Radius of 11.2 feet
Gross Alpha	Radius of 2.5 feet
Total Recoverable Silver	Radius of 5.0 feet

List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:

Date	Parameter and Units	Limit	Result
3/31/2015	RADIUM 226 + RADIUM 228, TOTAL – pCi/L	12.2	15.6
6/30/2015	SPECIFIC CONDUCTANCE – umho/cm	5089	7000
6/30/2015	RADIUM 226 + RADIUM 228, TOTAL – pCi/L	12.2	17.6
9/30/2015	SPECIFIC CONDUCTANCE – umho/cm	5089	6100

Describe previous FYI and WQBEL study:

Information not documented in the permit fact sheet.

Describe previous or current Enforcement Actions (including WLs):

Facility is currently under a Compliance Assistance Offer (CAO) letter for radium violations. There have been no further violations in over a year.

Describe any violations or problems noted in previous inspection:

Violations in table above were noted in the 3/29/16 Inspection and the CAO letter dated 5/13/16.

Discuss whether DMR trends within previous five years are improving or declining:

* Temperature dropped after 2011 and has remained steady.

* The following parameters seem to be going up over the last 5 years (particularly since 2014): Nitrogen/Ammonia Total, Phosphorus Total, Radium 226+228, Nitrogen Total

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):

PART II: Sampling Event Information	
Date(s) sample collected:	Sampler(s):
Temperature (Deg C):	pH (SU):
Dissolved Oxygen (mg/L):	Conductivity (umhos/cm):
Total Residual Chlorine (mg/L):	Total Residual Chlorine - after Disinfection (mg/L):
Method of Chlorination:	Method of De-chlorination:
Flow During Sample Collection for each outfall(MGD):	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day):	
Describe Discharge during Sampling Event: ☐ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify:	
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here:	

TOXICITY REQUIREMENTS: Reference permit section I.A.5

a. Effluent Limitation

(1) In any routine or additional follow-up test for chronic whole effluent toxicity, the 25 percent inhibition concentration (IC25) shall not be less than 20% effluent. [Rules 62-302.530(61) and 62-4.241(5), F.A.C.]

(2) For acute whole effluent toxicity, the 96-hour LC50 shall not be less than 20% effluent in any test. [Rules 62-302.500(1)(a)4 and 62-4.241(5), F.A.C.]

b. Monitoring Frequency

(1) Routine toxicity tests shall be conducted bi-annually (once every two years) starting from the time of the issuance date of this permit and lasting for the duration of this permit.

c. Sampling Requirements

(1) For each routine test or additional follow-up test conducted, a total of three grab samples of final effluent shall be collected and used in accordance with the sampling protocol discussed in EPA-821-R-02-013, Section 8.

(2) The first sample shall be used to initiate the test. The remaining two samples shall be collected according to the protocol and used as renewal solutions on Day 3 (48 hours) and Day 5 (96 hours) of the test.

(3) Samples for routine and additional follow-up tests shall not be collected on the same day.

d. Test Requirements

(1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) and a minimum of five test dilutions: 100, 50%, 30%, 20%, and 10% final effluent.

(2) The permittee shall conduct a daphnid, *Ceriodaphnia dubia*, Survival and Reproduction Test and a fathead minnow, *Pimephales promelas*, Larval Survival and Growth Test, concurrently.

(3) All test species, procedures and quality assurance criteria used shall be in accordance with Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 4th Edition, EPA-821-R-02-013. Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use. In the event the above method is revised, the permittee shall conduct chronic toxicity testing in accordance with the revised method.

(4) The control water and dilution water shall be moderately hard water as described in EPA-821-R-02-013, Section 7.2.3.

Appendix B

Explanation of Measurements

(1) Quality Assurance and Quality Control

FDEP's quality assurance requirements for analytical laboratories and field activities are codified in Chapter 62-160, F.A.C., Quality Assurance (QA Rule) and in internal Standard Operating Procedures (FDEP SOPs). Methods for all analyses are on file at the FDEP Central Laboratory in Tallahassee and may be viewed on the web at http://www.dep.state.fl.us/labs/library/lab_sops.htm and/or http://www.dep.state.fl.us/water/sas/sop/sops.htm.

(2) Chemical Analyses of the Effluent

The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides following FDEP SOPs. The results from these analyses were compared with Water Quality Criteria (62-302, F.A.C.) and facility permit limits.

(3) Toxicity Bioassays

Greater than 50% mortality in an acute toxicity test may constitute an exceedance of 62-302.500(1)a and/or facility permit limits. A 25% inhibition concentration (IC25) is the effluent concentration causing a 25% reduction in a biological response such as biomass or reproduction when compared to a control population. An IC25 of less than 100% in a chronic test may constitute exceedances of 62-302.530(20), 62-302.530(61) and/or facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(61) and/or facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

(4) Bacteriological Testing

High levels of fecal coliform bacteria may constitute an exceedance of 62-302.530(6) and/or facility permit limits. Fecal coliform and enterococci results often are based on colony counts outside the acceptable range (B-qualifier). The dilutions performed on the sample did not yield results within the method acceptable range of 20- 60 colony forming units per plate. The B-qualifier does not affect data quality.

(5) Chlorophyll *a* Content

Chlorophyll *a* content is an estimate algal biomass. High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C., and/or 62-302.530(47)(b), F.A.C..

(6) Algal Growth Potential (AGP)

The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L. The AGP range of 6.10 to 20.0 mg dry wt/L is suggested to be representative of high productivity for freshwater (Miller et al. 1978). High AGP values may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C. and/or 62-302.530(47)(b), F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP in a low salinity sample under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al*. 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of $\pm$ 20%. When the ratio of nitrogen to phosphorus (N:P) is less than 10:1, nitrogen limitation of algal production is likely. When the N:P ratio is 20:1 or greater, phosphorus limitation is likely (EPA-822-B-00-002). For ratios in-between, co-limitation may occur. Production of lower biomass than expected may be evidence of growth inhibition related to toxic compounds present in the water sample tested and may constitute an exceedance of 62-302.530(61) F.A.C. Expected AGP is not calculated for marine samples incubated with *Dunaliella*.

(7) Definition of Qualifiers

A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate
Z - Colonies were too numerous to count (TNTC)

Appendix C

Chemical analysis of effluent

Date Sampled	Field ID	Analysis Group	Components	Result	Units	MDL	PQL
09/12/2016	Hastings RO Final Eff.	AGP/LN	Algal Growth Potential	49.9 A	mg DryWt/L	0.3	0.9
09/12/2016	Hastings RO Final Eff.	AGP/LN	Algal Growth Potential-Salinity Adjusted	8.24 A	mg DryWt/L	3	3
09/12/2016	Hastings RO Final Eff.	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Uncorrected	0.40 U	µg/L	0.4	1.2
09/12/2016	Hastings RO Final Eff.	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.40 U	µg/L	0.4	1.2
09/12/2016	Hastings RO Final Eff.	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.55 U	µg/L	0.55	1.7
09/12/2016	Hastings RO Final Eff.	Chlorophyll/Grain Size/BOD	Chlorophyll/Phaeophytin Ratio	0.90		0	0
09/12/2016	Hastings RO Final Eff.	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.58 IJ	mg/L	0.2	2
09/12/2016	Hastings RO Final Eff.	Toxicology	Bioassay-Acute-Def-FW-C.dubia, LC50	74.2	LC50		
09/12/2016	Hastings RO Final Eff.	Toxicology	Bioassay-Acute-Def-FW-Fish, LC50	100 L	LC50		
09/12/2016	Hastings RO Final Eff.	Metals	Selenium	0.20 U	µg/L	0.2	0.8
09/12/2016	Hastings RO Final Eff.	Metals	Arsenic	0.42	µg/L	0.05	0.2
09/12/2016	Hastings RO Final Eff.	Metals	Iron	30 U	µg/L	30	120
09/12/2016	Hastings RO Final Eff.	Metals	Silver	0.0050 U	µg/L	0.005	0.02
09/12/2016	Hastings RO Final Eff.	Metals	Sodium	380	mg/L	5	20
09/12/2016	Hastings RO Final Eff.	Metals	Lead	0.050 U	µg/L	0.05	0.2
09/12/2016	Hastings RO Final Eff.	Metals	Nickel	0.050 U	µg/L	0.05	0.2
09/12/2016	Hastings RO Final Eff.	Metals	Aluminum	2.0 U	µg/L	2	8
09/12/2016	Hastings RO Final Eff.	Metals	Potassium	16.2	mg/L	0.3	1.2
09/12/2016	Hastings RO Final Eff.	Metals	Cadmium	0.020 U	µg/L	0.02	0.08
09/12/2016	Hastings RO Final Eff.	Metals	Chromium	0.053 I	µg/L	0.05	0.2
09/12/2016	Hastings RO Final Eff.	Metals	Copper	3.16	µg/L	0.1	0.4
09/12/2016	Hastings RO Final Eff.	Metals	Zinc	5.0 U	µg/L	5	20
09/12/2016	Hastings RO Final Eff.	Metals	Magnesium	359	mg/L	0.4	1.6
09/12/2016	Hastings RO Final Eff.	Metals	Calcium	618	mg/L	0.75	3
09/12/2016	Hastings RO Final Eff.	Nutrients	Chloride	780	mg Cl/L	4	10
09/12/2016	Hastings RO Final Eff.	Nutrients	Organic Carbon	4.3	mg C/L	0.5	1
09/12/2016	Hastings RO Final Eff.	Nutrients	Ammonia-N	0.93	mg N/L	0.04	0.1
09/12/2016	Hastings RO Final Eff.	Nutrients	Fluoride	1.3	mg F/L	0.035	0.1
09/12/2016	Hastings RO Final Eff.	Nutrients	Turbidity	0.20	NTU	0.1	0.1
09/12/2016	Hastings RO Final Eff.	Nutrients	TSS	2 I	mg/L	2	10
09/12/2016	Hastings RO Final Eff.	Nutrients	Total-P	0.12	mg P/L	0.01	0.1
09/12/2016	Hastings RO Final Eff.	Nutrients	NO2NO3-N	0.17	mg N/L	0.004	0.01
09/12/2016	Hastings RO Final Eff.	Nutrients	Color (true)	6.3	PCU	2.5	6
09/12/2016	Hastings RO Final Eff.	Nutrients	Total Alkalinity	265	mg CaCO3/L	0.65	2.5
09/12/2016	Hastings RO Final Eff.	Nutrients	Sulfate	2.2E+03	mg SO4/L	40	100
09/12/2016	Hastings RO Final Eff.	Nutrients	O-Phosphate-P	0.026	mg P/L	0.004	0.01

Date Sampled	Field ID	Analysis Group	Components	Result	Units	MDL	PQL
09/12/2016	Hastings RO Final Eff.	Nutrients	Kjeldahl Nitrogen	1.3	mg N/L	0.16	0.4
09/12/2016	Hastings RO Final Eff.	Overflow	Radium 228	0.748	pCi/L	0.459	
09/12/2016	Hastings RO Final Eff.	Overflow	Radium 228-Counting Error	0.326	pCi/L	0.459	
09/12/2016	Hastings RO Final Eff.	Overflow	Alpha, Total	37.6 U	pCi/L	37.6	
09/12/2016	Hastings RO Final Eff.	Overflow	Radium 226	6.96	pCi/L	0.0939	
09/12/2016	Hastings RO Final Eff.	Overflow	Beta, Total	15.2 U	pCi/L	15.2	
09/12/2016	Hastings RO Final Eff.	Overflow	Beta-Counting Error	9.83	pCi/L	15.2	
09/12/2016	Hastings RO Final Eff.	Overflow	Radium 226-Counting Error	0.387	pCi/L	0.0939	
09/12/2016	Hastings RO Final Eff.	Overflow	Alpha-Counting Error	24.5	pCi/L	37.6	
09/12/2016	Hastings RO Final Eff.	Pesticides	Atrazine	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Prometryn	0.019 U	µg/L	0.019	0.075
09/12/2016	Hastings RO Final Eff.	Pesticides	Diazinon	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Malathion	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Metribuzin	0.019 U	µg/L	0.019	0.075
09/12/2016	Hastings RO Final Eff.	Pesticides	Mevinphos	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Prometon	0.019 U	µg/L	0.019	0.075
09/12/2016	Hastings RO Final Eff.	Pesticides	Atrazine Desethyl	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Simazine	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Azinphos Methyl	0.019 U	µg/L	0.019	0.075
09/12/2016	Hastings RO Final Eff.	Pesticides	Bromacil	0.038 U	µg/L	0.038	0.15
09/12/2016	Hastings RO Final Eff.	Pesticides	Ethion	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Hexazinone	0.028 UJ	µg/L	0.028	0.11
09/12/2016	Hastings RO Final Eff.	Pesticides	Parathion Methyl	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Ametryn	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Chlorpyrifos Ethyl	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Chlorpyrifos Methyl	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Fenamiphos	0.028 U	µg/L	0.028	0.11
09/12/2016	Hastings RO Final Eff.	Pesticides	Norflurazon	0.028 U	µg/L	0.028	0.11
09/12/2016	Hastings RO Final Eff.	Pesticides	Atrazine Desisopropyl	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Ethoprop	0.0047 U	µg/L	0.0047	0.019
09/12/2016	Hastings RO Final Eff.	Pesticides	Fonofos	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Hastings RO Final Eff.	Pesticides	Phorate	0.0047 UJ	µg/L	0.0047	0.019
09/12/2016	Hastings RO Final Eff.	Pesticides	Sucralose	0.010 U	µg/L	0.01	0.04
09/12/2016	Hastings RO Final Eff.	Pesticides	Demeton	0.023 U	µg/L	0.023	0.09
09/12/2016	Hastings RO Final Eff.	Pesticides	Naled	0.038 U	µg/L	0.038	0.15
09/12/2016	Hastings RO Final Eff.	Pesticides	Parathion Ethyl	0.019 U	µg/L	0.019	0.075
09/12/2016	Hastings RO Final Eff.	Pesticides	Butylate	0.019 U	µg/L	0.019	0.075
09/12/2016	Hastings RO Final Eff.	Pesticides	Disulfoton	0.0047 UJ	µg/L	0.0047	0.019
09/12/2016	Hastings RO Final Eff.	Pesticides	Metalaxyl	0.038 U	µg/L	0.038	0.15

Date Sampled	Field ID	Analysis Group	Components	Result	Units	MDL	PQL
09/12/2016	Hastings RO Final Eff.	Pesticides	Metolachlor	0.056 U	µg/L	0.056	0.23
09/12/2016	Hastings RO Final Eff.	Pesticides	Alachlor	0.056 U	µg/L	0.056	0.23
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	2,4-Dinitrophenol	14 U	µg/L	14	56
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	2-Chloronaphthalene	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	µg/L	1.9	7.5
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	2-Chlorophenol	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	µg/L	1.9	7.5
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Phenanthrene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	2,4-Dichlorophenol	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	2,4-Dinitrotoluene	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.8 U	µg/L	2.8	11
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	4-Nitrophenol	14 U	µg/L	14	56
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Di-n-butyl phthalate	1.9 U	µg/L	1.9	7.5
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9 U	µg/L	1.9	7.5
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Pentachlorophenol	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Butyl benzyl phthalate	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Nitrobenzene	1.9 U	µg/L	1.9	7.5
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9 U	µg/L	1.9	7.5
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Acenaphthene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Anthracene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Chrysene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Diethyl phthalate	1.9 U	µg/L	1.9	7.5
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Fluorene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Hexachlorobutadiene	2.8 U	µg/L	2.8	11
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.8 U	µg/L	2.8	11
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Hexachloroethane	2.8 U	µg/L	2.8	11
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.8 U	µg/L	2.8	11
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	2,4-Dimethylphenol	9.4 U	µg/L	9.4	37
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	2-Nitrophenol	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Acenaphthylene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Benzo(a)pyrene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.8 U	µg/L	2.8	11

Date Sampled	Field ID	Analysis Group	Components	Result	Units	MDL	PQL
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Di-n-octyl phthalate	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	2,6-Dinitrotoluene	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Dimethyl phthalate	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Naphthalene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Phenol	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	3,3'-Dichlorobenzidine	37 U	µg/L	37	150
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Benzidine	94 U	µg/L	94	370
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Benzo(a)anthracene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Fluoranthene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Hexachlorobenzene	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Isophorone	0.94 U	µg/L	0.94	3.7
09/12/2016	Hastings RO Final Eff.	Priority Organic Pollutants	Pyrene	0.19 U	µg/L	0.19	0.75
09/12/2016	Hastings RO Final Eff.	Nutrients	pH	7.6			
09/12/2016	Hastings RO Final Eff.	Nutrients	Specific Conductance	5600	umhos/cm		
09/12/2016	Hastings RO Final Eff.	Nutrients	Temperature	24.7	C		
09/12/2016	Hastings RO Final Eff.	Nutrients	Dissolved Oxygen	6.4	mg/L		
09/12/2016	Hastings RO Final Eff.	Nutrients	Sample Depth	0.3	m		
09/12/2016	Field Blank	Metals	Calcium	0.075 U	mg/L	0.075	0.3
09/12/2016	Field Blank	Metals	Zinc	5.0 U	µg/L	5	20
09/12/2016	Field Blank	Metals	Silver	0.0050 U	µg/L	0.005	0.02
09/12/2016	Field Blank	Metals	Sodium	0.50 U	mg/L	0.5	2
09/12/2016	Field Blank	Metals	Potassium	0.30 U	mg/L	0.3	1.2
09/12/2016	Field Blank	Metals	Copper	0.10 U	µg/L	0.1	0.4
09/12/2016	Field Blank	Metals	Chromium	0.050 U	µg/L	0.05	0.2
09/12/2016	Field Blank	Metals	Cadmium	0.020 U	µg/L	0.02	0.08
09/12/2016	Field Blank	Metals	Magnesium	0.040 U	mg/L	0.04	0.16
09/12/2016	Field Blank	Metals	Lead	0.050 U	µg/L	0.05	0.2
09/12/2016	Field Blank	Metals	Aluminum	2.0 U	µg/L	2	8
09/12/2016	Field Blank	Metals	Selenium	0.20 U	µg/L	0.2	0.8
09/12/2016	Field Blank	Metals	Iron	30 U	µg/L	30	120
09/12/2016	Field Blank	Metals	Arsenic	0.050 U	µg/L	0.05	0.2
09/12/2016	Field Blank	Metals	Nickel	0.050 U	µg/L	0.05	0.2
09/12/2016	Field Blank	Nutrients	Total Alkalinity	0.65 U	mg CaCO3/L	0.65	2.5
09/12/2016	Field Blank	Nutrients	Total-P	0.002 U	mg P/L	0.002	0.005
09/12/2016	Field Blank	Nutrients	NO2NO3-N	0.004 U	mg N/L	0.004	0.01

Date Sampled	Field ID	Analysis Group	Components	Result	Units	MDL	PQL
09/12/2016	Field Blank	Nutrients	Turbidity	0.10 U	NTU	0.1	0.1
09/12/2016	Field Blank	Nutrients	Fluoride	0.035 U	mg F/L	0.035	0.1
09/12/2016	Field Blank	Nutrients	O-Phosphate-P	0.004 U	mg P/L	0.004	0.01
09/12/2016	Field Blank	Nutrients	Ammonia-N	0.002 U	mg N/L	0.002	0.005
09/12/2016	Field Blank	Nutrients	Color (true)	2.5 U	PCU	2.5	6
09/12/2016	Field Blank	Nutrients	Sulfate	0.20 U	mg SO4/L	0.2	0.5
09/12/2016	Field Blank	Nutrients	Chloride	0.20 U	mg Cl/L	0.2	0.5
09/12/2016	Field Blank	Nutrients	Kjeldahl Nitrogen	0.080 U	mg N/L	0.08	0.2
09/12/2016	Field Blank	Nutrients	Organic Carbon	0.50 U	mg C/L	0.5	1
09/12/2016	Field Blank	Overflow	Radium 226	0.117 U	pCi/L	0.117	
09/12/2016	Field Blank	Overflow	Alpha, Total	1.14 U	pCi/L	1.14	
09/12/2016	Field Blank	Overflow	Beta, Total	0.985 U	pCi/L	0.985	
09/12/2016	Field Blank	Overflow	Beta-Counting Error	0.587	pCi/L	0.985	
09/12/2016	Field Blank	Overflow	Radium 226-Counting Error	0.0759	pCi/L	0.117	
09/12/2016	Field Blank	Overflow	Radium 228	0.432 U	pCi/L	0.432	
09/12/2016	Field Blank	Overflow	Radium 228-Counting Error	0.242	pCi/L	0.432	
09/12/2016	Field Blank	Overflow	Alpha-Counting Error	0.552	pCi/L	1.14	
09/12/2016	Field Blank	Pesticides	Butylate	0.019 U	µg/L	0.019	0.076
09/12/2016	Field Blank	Pesticides	Norflurazon	0.028 U	µg/L	0.028	0.11
09/12/2016	Field Blank	Pesticides	Disulfoton	0.0047 UJ	µg/L	0.0047	0.019
09/12/2016	Field Blank	Pesticides	Mevinphos	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Pesticides	Prometon	0.019 U	µg/L	0.019	0.076
09/12/2016	Field Blank	Pesticides	Simazine	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Pesticides	Atrazine Desisopropyl	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Pesticides	Ethion	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Pesticides	Prometryn	0.019 U	µg/L	0.019	0.076
09/12/2016	Field Blank	Pesticides	Atrazine	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Pesticides	Chlorpyrifos Ethyl	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Pesticides	Malathion	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Pesticides	Phorate	0.0047 UJ	µg/L	0.0047	0.019
09/12/2016	Field Blank	Pesticides	Sucralose	0.010 U	µg/L	0.01	0.04
09/12/2016	Field Blank	Pesticides	Atrazine Desethyl	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Pesticides	Alachlor	0.057 U	µg/L	0.057	0.23
09/12/2016	Field Blank	Pesticides	Ametryn	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Pesticides	Naled	0.038 U	µg/L	0.038	0.15
09/12/2016	Field Blank	Pesticides	Parathion Ethyl	0.019 U	µg/L	0.019	0.076
09/12/2016	Field Blank	Pesticides	Bromacil	0.038 U	µg/L	0.038	0.15
09/12/2016	Field Blank	Pesticides	Demeton	0.023 U	µg/L	0.023	0.091
09/12/2016	Field Blank	Pesticides	Fenamiphos	0.028 U	µg/L	0.028	0.11

Date Sampled	Field ID	Analysis Group	Components	Result	Units	MDL	PQL
09/12/2016	Field Blank	Pesticides	Hexazinone	0.028 UJ	µg/L	0.028	0.11
09/12/2016	Field Blank	Pesticides	Metalaxyl	0.038 U	µg/L	0.038	0.15
09/12/2016	Field Blank	Pesticides	Metribuzin	0.019 U	µg/L	0.019	0.076
09/12/2016	Field Blank	Pesticides	Parathion Methyl	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Pesticides	Azinphos Methyl	0.019 U	µg/L	0.019	0.076
09/12/2016	Field Blank	Pesticides	Diazinon	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Pesticides	Ethoprop	0.0047 U	µg/L	0.0047	0.019
09/12/2016	Field Blank	Pesticides	Metolachlor	0.057 U	µg/L	0.057	0.23
09/12/2016	Field Blank	Pesticides	Fonofos	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Pesticides	Chlorpyrifos Methyl	0.0094 U	µg/L	0.0094	0.038
09/12/2016	Field Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.8 U	µg/L	2.8	11
09/12/2016	Field Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.4 U	µg/L	9.4	38
09/12/2016	Field Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9 U	µg/L	1.9	7.5
09/12/2016	Field Blank	Priority Organic Pollutants	4-Nitrophenol	14 U	µg/L	14	56
09/12/2016	Field Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	µg/L	1.9	7.5
09/12/2016	Field Blank	Priority Organic Pollutants	Diethyl phthalate	1.9 U	µg/L	1.9	7.5
09/12/2016	Field Blank	Priority Organic Pollutants	Dimethyl phthalate	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	Fluoranthene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	Hexachloroethane	2.8 U	µg/L	2.8	11
09/12/2016	Field Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9 U	µg/L	1.9	7.5
09/12/2016	Field Blank	Priority Organic Pollutants	Phenanthrene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.8 U	µg/L	2.8	11
09/12/2016	Field Blank	Priority Organic Pollutants	Acenaphthene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	Anthracene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	Butyl benzyl phthalate	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	Hexachlorobenzene	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	Naphthalene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	Pentachlorophenol	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	Pyrene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38 U	µg/L	38	150
09/12/2016	Field Blank	Priority Organic Pollutants	Acenaphthylene	0.19 U	µg/L	0.19	0.75

Date Sampled	Field ID	Analysis Group	Components	Result	Units	MDL	PQL
09/12/2016	Field Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	Di-n-butyl phthalate	1.9 U	µg/L	1.9	7.5
09/12/2016	Field Blank	Priority Organic Pollutants	Isophorone	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	µg/L	1.9	7.5
09/12/2016	Field Blank	Priority Organic Pollutants	Phenol	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	2,4-Dinitrophenol	14 U	µg/L	14	56
09/12/2016	Field Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	2-Chlorophenol	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	2-Nitrophenol	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	Fluorene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	Hexachlorobutadiene	2.8 U	µg/L	2.8	11
09/12/2016	Field Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.8 U	µg/L	2.8	11
09/12/2016	Field Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.8 U	µg/L	2.8	11
09/12/2016	Field Blank	Priority Organic Pollutants	Chrysene	0.19 U	µg/L	0.19	0.75
09/12/2016	Field Blank	Priority Organic Pollutants	Nitrobenzene	1.9 U	µg/L	1.9	7.5
09/12/2016	Field Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.94 U	µg/L	0.94	3.8
09/12/2016	Field Blank	Priority Organic Pollutants	Benzidine	94 U	µg/L	94	380
09/12/2016	Field Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.19 U	µg/L	0.19	0.75

EPA End Sheet

The Bioassay of Hastings R/O WTP - Reject Concentrate effluent sampled on September 12, 2016, NPDES #FL0169226.

Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 FL0169226	11 12 160912	18 B	19 S	20 2

Remarks

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The Priority Pollutants Analysis of Hastings R/O WTP - Reject Concentrate effluent sampled on September 12, 2016, NPDES #FL0169226.

Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 FL0169226	11 12 160912	18 X	19 S	20 2

Remarks

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Biological Analyses of Hastings R/O WTP - Reject Concentrate effluent sampled on September 12, 2016, NPDES #FL0169226.

Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 FL0169226	11 12 160912	18 S	19 S	20 2

Remarks

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