



UNC  
ENVIRONMENT,  
HEALTH & SAFETY

The University of North Carolina at Chapel Hill  
Department of Environment, Health & Safety  
1120 Estes Drive Ext., CB# 1650  
Chapel Hill, North Carolina 27599-1650

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February 27, 2015

Information Processing Unit  
NCDENR - Division of Water Quality  
1617 Mail Service Center  
Raleigh, NC 27699-1617

Subject: Annual Report, Permit WQ0023896  
The University of North Carolina at Chapel Hill  
Bingham Facility  
Orange County, North Carolina

Dear Sir or Madam:

Enclosed please find the annual report for the subject permit. An electronic copy of this report was also sent to Ray Milosh of the DENR Raleigh Regional Office and Nathaniel Thornburg of the DENR Non-Discharge Permitting Unit.

If you have any questions or require additional information, please call me at (919) 962-6666.

Sincerely,

  
J. Laurence Daw, L.G.  
Environmental Compliance Officer

Enclosures

Bcc: Bingham Facility  
Mal Donohue w/o attachment  
Mary Beth Koza  
Kara Simmons

February 27, 2015

Ms. Mary Beth Koza  
Director - Department of Environment, Health, and Safety  
The University of North Carolina at Chapel Hill  
1120 Estes Drive Extension CB# 1650  
Chapel Hill, NC 27599-1650

RE: 2014 Annual Report  
The University of North Carolina at Chapel Hill (UNC-CH)  
Bingham Facility Wastewater Irrigation System  
Orange County, North Carolina Permit No. WQ0023896

Dear Mary Beth:

This Annual Report is written in accordance with the requirements of the subject permit as specified in condition IV. 15. to provide an annual report summarizing the performance of the wastewater treatment plant (WWTP) and drip irrigation system.

### **Summary Description of Wastewater Treatment System**

The wastewater treatment system provides secondary treatment for a permitted capacity of 3,556 GPD of domestic wastewater generated from the three existing animal care buildings at the Bingham Facility. Wastewater is conveyed to the AdvanTex secondary wastewater treatment system via a gravity sewer collection system. The AdvanTex secondary wastewater treatment system consists of an 8,000 gallon domestic wastewater septic tank, a 20 GPM septic tank effluent pump station, and a 4,000 gallon AdvanTex recirculation tank with two (2) 55 GPM pumps to recirculate wastewater through the two (2) AdvanTex textile media wastewater treatment filter pods. Treated effluent from the Advantex system flows through a chlorine contact tank with sodium hypochlorite injection for disinfection, an ultrasonic flow monitoring system, and a duplex 80 GPM secondary effluent pump station to pump treated wastewater to the 1,122,440 gallon clay lined wet weather storage basin. A 75,843 gallon clay lined effluent storage basin is provided at the effluent pump station for secondary storage of effluent. The wet weather storage basin includes a duplex

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150 gpm irrigation pump station to convey treated effluent to one of four drip irrigation zones for tertiary treatment in the soils via uptake by the grass, trees, and shrubs in the drip irrigation fields and dispersal into the surficial aquifer.

From January 2014 through most of May 2014, the facility operated under NCDENR Pump and Haul permit number WQ0034607. The pump and haul operation ended on May 26, 2014, and the wastewater treatment system returned to normal operation on May 27, 2014 after completion of construction activities to refurbish the system.

**Permit Item IV. 15. a. - Permit Limits and Exceedances**

*WWTP Effluent*

Table 1 lists WWTP effluent limits established by the permit and the number of exceedances identified in 2014.

**Table 1 – WWTP Effluent Permit Limits and Exceedances**

<b>Parameter</b>	<b>Monthly Avg. Limit</b>	<b>No. of Permit Exceedances</b>
Flow, Gallons Per Day (GPD)	3,556	0
Biochemical Oxygen Demand (BOD), mg/l	30	0
Ammonia, mg/l	15	0
Total Suspended Solids (TSS), mg/l	30	0
Fecal Coliform, #/100 ml	200/100 ml *	0

\* Monthly Geometric Mean

**Surface Water Monitoring**

Table 2 and 3 are summaries of the surface water monitoring quality limits and the number of exceedances identified in 2014.

**Table 2 – Surface Water Monitoring Limits and Exceedances**

Parameter	Limit	SW-1	SW-2	SW-3	SW-4
Dissolved Oxygen (DO), mg/l	5	1	0	0	0
Nitrate, mg/l	10	0	0	0	0
pH, units	6-9	1	0	1	0

The NCDENR permit does not specifically establish surface water quality limits, but the limits shown were taken from the 15A NCAC 2B surface water quality standards.

**Table 3 – Recorded Surface Water Quality Exceedances**

Location	Parameter	Limit	Measured Value	Date
SW-1	DO	5 mg/l	0.96 mg/l	6/12/14
SW-1	pH	6-9	9.15	12/4/14
SW-3	pH	6-9	9.22	12/4/14

Both SW-1 and SW-3 are upgradient sampling locations; therefore, these measured values above the limits are not likely the result of site activities.

***Land Application***

Table 4 is a summary of the land application limits and the number of permit exceedances identified in 2014.

**Table 4 – Land Application Limits and Exceedances**

<b>Irrigation Field</b>	<b>Hourly Rate Limit (in.)</b>	<b>Yearly Maximum (in.)</b>	<b>No. of Exceedances</b>
1	0.22	10.92	0
2	0.22	10.92	0
3	0.22	10.92	0
4	0.22	10.92	0

***Groundwater Monitoring***

Groundwater quality permit limits and exceedances for 2014 are summarized in Table 5 and 6.

**Table 5 – Groundwater Quality Permit Limits and Exceedances**

<b>Parameter</b>	<b>Daily Max.</b>	<b>MW-1</b>	<b>MW-3</b>	<b>MW-4</b>	<b>MW-5</b>	<b>MW-6</b>
<b>TOC, mg/l</b>	10	0	1	0	1	1
<b>Chloride mg/l</b>	250	0	0	0	0	0
<b>Coliform #/100 ml</b>	1/100 ml	0	4	4	1	0
<b>Ammonia, mg/l</b>	1.5	0	0	0	0	0
<b>Nitrate, mg/l</b>	10	0	0	0	0	0
<b>pH, units</b>	6.5 - 8.5	1	2	2	2	0
<b>TDS, mg/l</b>	500	0	1	0	0	0
<b>VOC</b>	Yes / No	No	No	No	No	No

**Table 6 – Recorded Groundwater Quality Exceedances**

Location	Parameter	Limit	Measured Value	Date
MW-1	pH	6.5-8.5	5.6 units	9/12/14
MW-3	TDS	500 mg/l	505 mg/l	3/21/14
MW-3	TOC	10 mg/l	11 mg/l	6/12/14
MW-3	pH	6.5 – 8.5	5.72 units	6/12/14
MW-3	pH	6.5-8.5	8.6 units	9/12/14
MW-3	Coliform	1/100 ml	2/100 ml	6/19/14
MW-3	Coliform	1/100 ml	4/100 ml	9/12/14
MW-3	Coliform	1/100 ml	100/100 ml	12/4/14
MW-3	Coliform	1/100 ml	1/100 ml	6/12/14
MW-4	pH	6.5-8.5	6.45 units	3/21/14
MW-4	pH	6.5-8.5	6.1 units	12/4/14
MW-4	Coliform	1/100 ml	14/100 ml	6/12/14
MW-4	Coliform	1/100 ml	3/100 ml	9/12/14
MW-4	Coliform	1/100 ml	100/100 ml	12/4/14
MW-4	Coliform	1/100 ml	14/100 ml	12/12/14
MW-5	Coliform	1/100 ml	1/100 ml	6/12/14
MW-5	TOC	10 mg/l	15.4 mg/l	6/12/14
MW-5	pH	6.5-8.5	6.3 units	9/12/14
MW-5	pH	6.5-8.5	6.4 units	12/4/14
MW-6	TOC	10 mg/l	29.3 mg/l	6/12/14

In all of 2014, only 0.08 inches of treated wastewater were applied to Field 1, 0.13 inches were applied to Field 2, 0.05 inches were applied to Field 3, and 0.08 inches were applied to Field 4. Given that the amount of treated wastewater applied in all of 2014 is only about one percent of the permitted application limit, it is very unlikely that any of the exceedances in Table 6 are attributed to drip irrigation at the facility. Additionally, MW-1 and MW-4 are located upgradient of the irrigation fields.

Larry Daw, of UNC, and Ray Milosh, the NCDENR Regional Inspector, have discussed by telephone conversation and email correspondence, the numerous occurrences of coliform bacteria in monitoring wells MW-3 (down-gradient well) and MW-4 (up-gradient well).. As a result of these communications, all of the groundwater monitoring wells were disinfected with chlorine in late October 2014. Coliform bacteria continues to be present in groundwater monitoring wells at the site following disinfection, and there is an ongoing discussion regarding

causes and possible remedies. In 2014, only 0.08 inches of treated wastewater were applied to Field 4. It is highly unlikely that the surface application of treated wastewater is the cause of the presence of coliform bacteria.

**Permit Item IV. 15. b. - Irrigation Meter Calibration**

Attached with this letter report is a copy of the flow meter calibration documentation from ClearWater, Inc. for the ultrasonic effluent flow meter and the magnetic flow meter at the drip irrigation pump station.

**Permit Item IV. 15. c. - Residuals**

No residual solids were removed from the wastewater treatment system in 2014.

**Permit Item IV. 15. d. - Soil Analysis**


Attached is a copy of the soil fertility analysis of representative soil samples taken from the four drip irrigation fields. The results of the analysis generally indicate low levels of nitrogen and phosphorus in the soil to support indigenous vegetation in the drip fields. Wastewater irrigation to the site will improve soil fertility by providing additional nitrogen and phosphorus nutrients to the soil.

**Permit Item IV. 15. e. - Priority Pollutant Analysis**

A copy of the NCDENR priority pollutant scan is attached with this letter report. The priority pollutant analyses identified low concentrations of metals (chromium and zinc), nitrogen compounds, hardness, TDS, phosphorus, and chloroform. All of these results are within normal ranges for treated wastewater.

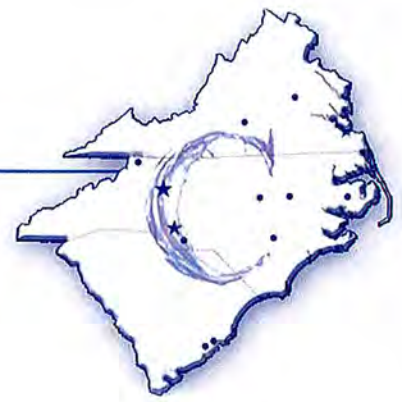
Please let me know if you have any questions or comments. Thank you for the opportunity to provide professional engineering services for UNC-Chapel Hill.

Sincerely,  
McKim & Creed, Inc.

  
Charles D. Riley, Jr. PE  
Senior Project Engineer

**Flow Meter  
Calibration  
Documentation**





January 19, 2015

Mr. David McSherry  
UNC Chapel Hill  
111 Airport Drive  
Chapel Hill, NC 27599

Re: Flow Meter Calibration – **Bingham Facility**

Dear Mr. McSherry,

This is to certify that on January 15, 2015, that I was at your facility to calibrate the Isco Model 3010 Flow Meter (Serial No. 208D01055) with Large Trapezoidal Flume; and calibrated the EMCO 4411e Mag Meter according to factory specifications. A calibration sticker was placed on the equipment.

If you have any questions, or if I can be of assistance in any manner, please contact me at (910) 337-3952.

Best Regards,

CLEARWATER, INC.

*Micah Brewington / dg*

Micah Brewington  
Service Technician

MB:dg

**EQUIPMENT SERVICE / CALIBRATION**

CUSTOMER <i>VNC Chapel Hill</i>		DATE <i>7-15-15</i>				
ADDRESS <i>111 Airport Drive</i>		CONTACT <i>David Mc Sherry Mc Sherry</i>				
CITY, STATE ZIP CODE <i>Chapel Hill NC 27599</i>		TELEPHONE # <i>719-813-5326</i>				
SERIAL NUMBER <i>208D01655</i>	PURCHASE ORDER #					
TOTALIZER <i>0011592 x 100 GAL</i>	**** PLEASE PROVIDE PO# AT TIME OF SERVICE OR CALL OR EMAIL PO# TO MAIN OFFICE AT 828-855-3182 or Jaimie@clearwaterinc.net ****					
BEGIN LEVEL <i>0.05 Ft</i>	NEXT SERVICE VISIT <input type="checkbox"/> 3 months <input type="checkbox"/> 6 months <input checked="" type="checkbox"/> 12 months					
END LEVEL <i>0.05 Ft</i>						
CALIBRATION	REPAIR	EQUIPMENT	SIZE	PRIMARY DEVICE	SERVICE PRICE	
<input type="checkbox"/>	<input type="checkbox"/>	4210 Ultrasonic Flow Meter	<input checked="" type="checkbox"/> <i>15"</i>	Trapezoidal Flume	<i>600.00</i>	
<input type="checkbox"/>	<input type="checkbox"/>	4220 Submerged Probe Flow Meter	<input type="checkbox"/>	Parshall Flume		
<input type="checkbox"/>	<input type="checkbox"/>	4230 Bubbler Flow Meter	<input type="checkbox"/>	Palmer-Bowlus Flume		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3010 Ultrasonic Flow Transmitter	<input type="checkbox"/>	V-notch Weir		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3210 Flow Meter	<input type="checkbox"/>	Rectangular Weir		
<input type="checkbox"/>	<input type="checkbox"/>	3230 Flow Meter	<input checked="" type="checkbox"/>	<i>pipe</i>		
<input type="checkbox"/>	<input type="checkbox"/>	Signature Flow Meter	PARTS REPLACED			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Mag Meter: <i>EMCO 4416</i>	QTY	P/N	DESCRIPTION	PARTS PRICE
<input type="checkbox"/>	<input type="checkbox"/>			60-9004-125	Isco double junction pH/temp probe	
<input type="checkbox"/>	<input type="checkbox"/>	Sampler:		60-3213-098	Printer Assembly	
<input type="checkbox"/>	<input type="checkbox"/>			60-2313-019	Plotter Paper	
<input type="checkbox"/>	<input type="checkbox"/>			250-0200-00	Printer Ribbon	
<input type="checkbox"/>	<input type="checkbox"/>					
<input type="checkbox"/> Confined Space Service						
<input type="checkbox"/> Calibrated pH @ 4, 7 & 10 Buffers						
<input type="checkbox"/> Cleaned Bubble Tube & Line <input type="checkbox"/> Checked Chart Recorder <input checked="" type="checkbox"/> Signal Strength (4210): <i>92.99</i>						
<input type="checkbox"/> Desiccant Change <input type="checkbox"/> Pump Duty Cycle (4230):						
<input type="checkbox"/> Checked Battery Backed Power Pack - Supply Voltage:						
<input type="checkbox"/> Mileage _____ miles @ \$ _____ /mile						
<input type="checkbox"/> SPECIAL CAL LETTER						TOTAL <i>600.00</i>
COMMENTS						
<i>* Tot # 147116 Gal</i>						
<i>Calibrated meter with zero flow meter reads zero.</i>						
<i>Also checked program in meter</i>						
<i>Calibrated meter with float gauge. Cal letter required.</i>						
<b>** THIS IS NOT AN INVOICE. PLEASE DO NOT PAY FROM THIS SERVICE FORM **</b>						
<i>[Signature]</i> Clearwater, Inc. Service Technician			<i>[Signature]</i> Customer Signature			

# **Soil Fertility Analysis Reports**



# Environmental Chemists, Inc.

6602 Windmill Way • Wilmington, NC 28405  
(910) 392-0223 (Lab) • (910) 392-4424 (Fax)

710 Bowsertown Road • Manteo, NC 27954  
(252) 473-5702

ANALYTICAL & CONSULTING  
CHEMISTS

NCDENR: DWQ CERTIFICATE #94. DLS CERTIFICATE #37729

**UNC-Chapel Hill**  
1120 Estes Drive Extension  
Chapel Hill NC 27599-1650  
Attention: Larry Daw, L.G.

**Date of Report:** Feb 04, 2015  
**Customer PO #:**  
**Customer ID:** 13060013  
**Report #:** 2015-00984  
**Project ID:** UNC-Bingham (soil samples)

Lab ID	Sample ID:	Collect Date/Time	Matrix	Sampled by
15-02210	Site: Field 1	1/23/2015 10:25 AM	Solid/Sludge	Jay Baker/Envirochem

Test	Method	Results	Date Analyzed
pH	NCDA-Agronomic Division	5.60 units	01/29/2015
<b>Soil Fertility</b>			
Calcium	EPA 200.7	303 mg/kg	01/28/2015
Copper	EPA 200.7	7.50 mg/kg	01/29/2015
Magnesium	EPA 200.7	364 mg/kg	01/28/2015
Manganese	EPA 200.7	15.3 mg/kg	01/30/2015
Potassium	EPA 200.7	229 mg/kg	01/28/2015
Sodium	EPA 200.7	111 mg/kg	01/28/2015
Zinc	EPA 200.7	8.91 mg/kg	01/29/2015
Acidity (Soil Fertility)	NCDA-Agronomic Division	2.54 meq/100g	01/29/2015
Base Saturation	NCDA-Agronomic Division	66.7 %	02/04/2015
Cation Exchange Capacity	NCDA-Agronomic Division	7.63 meq/100g	02/04/2015
Exchangeable Sodium Percentage	NCDA-Agronomic Division	6.32 %	02/04/2015
Humic Matter	NCDA-Agronomic Division	0.74 %	01/29/2015
Total Solids (%)	SM 2540 B	78.7 %	01/26/2015
Total Phosphorus	SM 4500 P F	11.3 mg/kg	01/29/2015



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**UNC-Chapel Hill**  
1120 Estes Drive Extension  
Chapel Hill NC 27599-1650  
Attention: Larry Daw, L.G.

**Date of Report:** Feb 04, 2015  
**Customer PO #:**  
**Customer ID:** 13060013  
**Report #:** 2015-00984  
**Project ID:** UNC-Bingham (soil samples)

Lab ID	Sample ID:	Collect Date/Time	Matrix	Sampled by
15-02212	Site: Field 2	1/23/2015 10:35 AM	Solid/Sludge	Jay Baker/Envirochem

Test	Method	Results	Date Analyzed
pH	NCDA-Agronomic Division	4.74 units	01/29/2015
<b>Soil Fertility</b>			
Calcium	EPA 200.7	217 mg/kg	01/28/2015
Copper	EPA 200.7	6.44 mg/kg	01/29/2015
Magnesium	EPA 200.7	326 mg/kg	01/28/2015
Manganese	EPA 200.7	7.97 mg/kg	01/30/2015
Potassium	EPA 200.7	261 mg/kg	01/28/2015
Sodium	EPA 200.7	19.7 mg/kg	01/28/2015
Zinc	EPA 200.7	9.38 mg/kg	01/29/2015
Acidity (Soil Fertility)	NCDA-Agronomic Division	3.93 meq/100g	01/29/2015
Base Saturation	NCDA-Agronomic Division	53.0 %	02/04/2015
Cation Exchange Capacity	NCDA-Agronomic Division	8.37 meq/100g	02/04/2015
Exchangeable Sodium Percentage	NCDA-Agronomic Division	1.02 %	02/04/2015
Humic Matter	NCDA-Agronomic Division	2.95 %	01/29/2015
Total Solids (%)	SM 2540 B	77.8 %	01/26/2015
Total Phosphorus	SM 4500 P F	14.8 mg/kg	01/29/2015



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**UNC-Chapel Hill**  
1120 Estes Drive Extension  
Chapel Hill NC 27599-1650  
Attention: Larry Daw, L.G.

**Date of Report:** Feb 04, 2015  
**Customer PO #:**  
**Customer ID:** 13060013  
**Report #:** 2015-00984  
**Project ID:** UNC-Bingham (soil samples)

Lab ID	Sample ID:	Collect Date/Time	Matrix	Sampled by
15-02213	Site: Field 3	1/23/2015 10:45 AM	Solid/Sludge	Jay Baker/Envirochem

Test	Method	Results	Date Analyzed
pH	NCDA-Agronomic Division	4.57 units	01/29/2015
<b>Soil Fertility</b>			
Calcium	EPA 200.7	273 mg/kg	01/28/2015
Copper	EPA 200.7	3.85 mg/kg	01/29/2015
Magnesium	EPA 200.7	174 mg/kg	01/28/2015
Manganese	EPA 200.7	10.1 mg/kg	01/30/2015
Potassium	EPA 200.7	206 mg/kg	01/28/2015
Sodium	EPA 200.7	13.7 mg/kg	01/28/2015
Zinc	EPA 200.7	6.45 mg/kg	01/29/2015
Acidity (Soil Fertility)	NCDA-Agronomic Division	4.08 meq/100g	01/29/2015
Base Saturation	NCDA-Agronomic Division	44.9 %	02/04/2015
Cation Exchange Capacity	NCDA-Agronomic Division	7.40 meq/100g	02/04/2015
Exchangeable Sodium Percentage	NCDA-Agronomic Division	0.805 %	02/04/2015
Humic Matter	NCDA-Agronomic Division	0.68 %	01/29/2015
Total Solids (%)	SM 2540 B	81.7 %	01/26/2015
Total Phosphorus	SM 4500 P F	17.2 mg/kg	01/29/2015



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1120 Estes Drive Extension  
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Attention: Larry Daw, L.G.

**Date of Report:** Feb 04, 2015  
**Customer PO #:**  
**Customer ID:** 13060013  
**Report #:** 2015-00984  
**Project ID:** UNC-Bingham (soil samples)

Lab ID	Sample ID:	Collect Date/Time	Matrix	Sampled by
15-02214	Site: Field 4	1/23/2015 10:55 AM	Solid/Sludge	Jay Baker/Envirochem

Test	Method	Results	Date Analyzed
pH	NCDA-Agronomic Division	4.59 units	01/29/2015
<b>Soil Fertility</b>			
Calcium	EPA 200.7	137 mg/kg	01/28/2015
Copper	EPA 200.7	2.67 mg/kg	01/29/2015
Magnesium	EPA 200.7	172 mg/kg	01/28/2015
Manganese	EPA 200.7	331 mg/kg	02/02/2015
Potassium	EPA 200.7	137 mg/kg	01/28/2015
Sodium	EPA 200.7	12.8 mg/kg	01/28/2015
Zinc	EPA 200.7	5.81 mg/kg	01/29/2015
Acidity (Soil Fertility)	NCDA-Agronomic Division	4.04 meq/100g	01/29/2015
Base Saturation	NCDA-Agronomic Division	37.8 %	02/04/2015
Cation Exchange Capacity	NCDA-Agronomic Division	6.49 meq/100g	02/04/2015
Exchangeable Sodium Percentage	NCDA-Agronomic Division	0.857 %	02/04/2015
Humic Matter	NCDA-Agronomic Division	2.70 %	01/29/2015
Total Solids (%)	SM 2540 B	79.5 %	01/26/2015
Total Phosphorus	SM 4500 P F	22.3 mg/kg	01/29/2015

Comment: Results reported on a dry weight basis.

Reviewed by: Jim Pease





**Priority Pollutant  
Analysis of  
Treated Wastewater**



# Environmental Chemists, Inc.

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**UNC-Chapel Hill**  
 1120 Estes Drive Extension  
 Chapel Hill NC 27599-1650  
 Attention: Larry Daw, L.G.

**Date of Report:** Feb 10, 2015  
**Customer PO #:**  
**Customer ID:** 13060013  
**Report #:** 2015-00983  
**Project ID:** UNC-Bingham WWTP Effluent

Lab ID	Sample ID:	Collect Date/Time	Matrix	Sampled by
15-02201	Site: Effluent (composite @ lagoon)	1/23/2015 10:05 AM	Water	Jay Baker/Envirochem
Test	Method	Results	Date Analyzed	
Beryllium	EPA 200.7	<0.010 mg/L	02/02/2015	
Chromium	EPA 200.7	0.020 mg/L	02/02/2015	
Zinc	EPA 200.7	0.011 mg/L	02/02/2015	
Antimony	EPA 200.8	<0.010 mg/L	01/30/2015	
Arsenic	EPA 200.8	<0.010 mg/L	01/30/2015	
Cadmium	EPA 200.8	<0.010 mg/L	01/30/2015	
Copper	EPA 200.8	<0.010 mg/L	01/30/2015	
Lead	EPA 200.8	<0.010 mg/L	01/30/2015	
Nickel	EPA 200.8	<0.010 mg/L	01/30/2015	
Selenium	EPA 200.8	<0.010 mg/L	01/30/2015	
Silver	EPA 200.8	<0.010 mg/L	01/30/2015	
Thallium	EPA 200.8	<0.010 mg/L	01/30/2015	
Mercury	EPA 245.1	<0.0002 mg/L	01/28/2015	
Ammonia Nitrogen	EPA 350.1	0.9 mg/L	01/27/2015	
Total Kjeldahl Nitrogen (TKN)	EPA 351.2	2.3 mg/L	01/29/2015	
Total Hardness	SM 2340 C	96 mg/L	01/30/2015	
Total Dissolved Solids (TDS)	SM 2540 C	823 mg/L	01/23/2015	
Total Phosphorus	SM 4500 P F	0.62 mg/L	01/29/2015	
<b>Nitrate Nitrogen (Calc)</b>				
Nitrite Nitrogen	EPA 353.2	0.19 mg/L	01/23/2015	
Nitrate+Nitrite-Nitrogen	EPA 353.2	2.08 mg/L	01/27/2015	
Nitrate Nitrogen	Subtraction Method	1.89 mg/L	01/27/2015	



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**UNC-Chapel Hill**  
1120 Estes Drive Extension  
Chapel Hill NC 27599-1650  
Attention: Larry Daw, L.G.

**Date of Report:** Feb 10, 2015  
**Customer PO #:**  
**Customer ID:** 13060013  
**Report #:** 2015-00983  
**Project ID:** UNC-Bingham WWTP Effluent

Lab ID	Sample ID:	Collect Date/Time	Matrix	Sampled by
15-02202	Site: Effluent (grab @ lagoon)	1/23/2015 9:50 AM	Water	Jay Baker/Envirochem

Test	Method	Results	Date Analyzed
Oil & Grease (O&G)	EPA 1664	<5 mg/L	1/29/2015
Cyanide	EPA 335.4	< 0.005 mg/L	01/28/2015
Inorganic Phenols	EPA 420.1	<0.008 mg/L	01/29/2015
1,1,1-Trichloroethane	EPA 624	<0.5 µg/L	01/30/2015
1,1,2,2-Tetrachloroethane	EPA 624	<0.5 µg/L	01/30/2015
1,1,2-Trichloroethane	EPA 624	<0.5 µg/L	01/30/2015
1,1-Dichloroethane	EPA 624	<0.5 µg/L	01/30/2015
1,1-Dichloroethene	EPA 624	<0.5 µg/L	01/30/2015
1,2-Dichlorobenzene	EPA 624	<0.5 µg/L	01/30/2015
1,2-Dichloroethane	EPA 624	<0.5 µg/L	01/30/2015
1,2-Dichloropropane	EPA 624	<0.5 µg/L	01/30/2015
1,3-Dichlorobenzene	EPA 624	<0.5 µg/L	01/30/2015
1,4-Dichlorobenzene	EPA 624	<0.5 µg/L	01/30/2015
2-Chloroethylvinyl ether	EPA 624	<0.5 µg/L	01/30/2015
Acrolein	EPA 624	<5 µg/L	01/30/2015
Acrylonitrile	EPA 624	<5 µg/L	01/30/2015
Benzene	EPA 624	<0.5 µg/L	01/30/2015
Bromodichloromethane	EPA 624	0.570 µg/L	01/30/2015
Bromoform	EPA 624	<0.5 µg/L	01/30/2015
Bromomethane	EPA 624	<0.5 µg/L	01/30/2015
Carbon tetrachloride	EPA 624	<0.5 µg/L	01/30/2015
Chlorobenzene	EPA 624	<0.5 µg/L	01/30/2015
Chloroethane	EPA 624	<0.5 µg/L	01/30/2015
Chloroform	EPA 624	1.05 µg/L	01/30/2015
Chloromethane	EPA 624	<0.5 µg/L	01/30/2015
cis-1,3-Dichloropropene	EPA 624	<0.5 µg/L	01/30/2015



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710 Bowsertown Road • Manteo, NC 27954  
(252) 473-5702

ANALYTICAL & CONSULTING  
CHEMISTS

NCDENR: DWQ CERTIFICATE #94. DLS CERTIFICATE #37729

**UNC-Chapel Hill**  
1120 Estes Drive Extension  
Chapel Hill NC 27599-1650  
Attention: Larry Daw, L.G.

**Date of Report:** Feb 10, 2015  
**Customer PO #:**  
**Customer ID:** 13060013  
**Report #:** 2015-00983  
**Project ID:** UNC-Bingham WWTP Effluent

Dibromochloromethane	EPA 624	<0.5 µg/L	01/30/2015
Ethylbenzene	EPA 624	<0.5 µg/L	01/30/2015
IPE	EPA 624	<0.5 µg/L	01/30/2015
M+P Xylene	EPA 624	<1.0 µg/L	01/30/2015
Methylene chloride	EPA 624	<0.5 µg/L	01/30/2015
MTBE	EPA 624	<0.5 µg/L	01/30/2015
Naphthalene	EPA 624	<0.5 µg/L	01/30/2015
ortho-Xylene	EPA 624	<0.5 µg/L	01/30/2015
Tetrachloroethene	EPA 624	<0.5 µg/L	01/30/2015
Toluene	EPA 624	<0.5 µg/L	01/30/2015
Trans-1,2-Dichloroethene	EPA 624	<0.5 µg/L	01/30/2015
trans-1,3-Dichloropropene	EPA 624	<0.5 µg/L	01/30/2015
Trichloroethene	EPA 624	<0.5 µg/L	01/30/2015
Trichlorofluoromethane	EPA 624	<0.5 µg/L	01/30/2015
Vinyl chloride	EPA 624	<0.5 µg/L	01/30/2015
2,4,6-Trichlorophenol	EPA 625	<5 µg/L	01/27/2015
2,4-Dichlorophenol	EPA 625	<5 µg/L	01/27/2015
2,4-Dimethylphenol	EPA 625	<5 µg/L	01/27/2015
2,4-Dinitrophenol	EPA 625	<25 µg/L	01/27/2015
2-Chlorophenol	EPA 625	<5 µg/L	01/27/2015
2-Methyl-4,6-dinitrophenol	EPA 625	<25 µg/L	01/27/2015
2-Nitrophenol	EPA 625	<25 µg/L	01/27/2015
4-Chloro-3-methylphenol	EPA 625	<5 µg/L	01/27/2015
4-Nitrophenol	EPA 625	<25 µg/L	01/27/2015
Pentachlorophenol	EPA 625	<25 µg/L	01/27/2015
Phenol	EPA 625	<5 µg/L	01/27/2015
1,2 Diphenylhydrazine	EPA 625	<5 µg/L	01/27/2015
1,2,4-Trichlorobenzene	EPA 625	<5 µg/L	01/27/2015
1,2-Dichlorobenzene	EPA 625	<5 µg/L	01/27/2015
1,3-Dichlorobenzene	EPA 625	<5 µg/L	01/27/2015



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1,4-Dichlorobenzene	EPA 625	<5 µg/L	01/27/2015
1-Methylnaphthalene	EPA 625	<5 µg/L	01/27/2015
2,4-Dinitrotoluene	EPA 625	<5 µg/L	01/27/2015
2,6-Dinitrotoluene	EPA 625	<5 µg/L	01/27/2015
2-Chloronaphthalene	EPA 625	<5 µg/L	01/27/2015
2-Methylnaphthalene	EPA 625	<5 µg/L	01/27/2015
3,3'-Dichlorobenzidine	EPA 625	<10 µg/L	01/27/2015
4-Bromophenyl phenyl ether	EPA 625	<5 µg/L	01/27/2015
4-Chlorophenyl phenyl ether	EPA 625	<5 µg/L	01/27/2015
Acenaphthene	EPA 625	<5 µg/L	01/27/2015
Acenaphthylene	EPA 625	<5 µg/L	01/27/2015
Anthracene	EPA 625	<5 µg/L	01/27/2015
Benzidine	EPA 625	<10 µg/L	01/27/2015
Benzo [a]pyrene	EPA 625	<5 µg/L	01/27/2015
Benzo(a)anthracene	EPA 625	<5 µg/L	01/27/2015
Benzo(b)fluoranthene	EPA 625	<5 µg/L	01/27/2015
Benzo(g,h,i)perylene	EPA 625	<5 µg/L	01/27/2015
Benzo(k)fluoranthene	EPA 625	<5 µg/L	01/27/2015
Bis ( chloromethyl ) ether	EPA 625	<5 µg/L	01/27/2015
Bis(2-Chloroethoxy)methane	EPA 625	<5 µg/L	01/27/2015
Bis(2-Chloroethyl)ether	EPA 625	<5 µg/L	01/27/2015
Bis(2-Chloroisopropyl)ether	EPA 625	<5 µg/L	01/27/2015
Bis(2-ethylhexyl)phthalate	EPA 625	<5 µg/L	01/27/2015
Butylbenzylphthalate	EPA 625	<5 µg/L	01/27/2015
Chrysene	EPA 625	<5 µg/L	01/27/2015
Dibenzo(a,h)anthracene	EPA 625	<5 µg/L	01/27/2015
Diethylphthalate	EPA 625	<5 µg/L	01/27/2015
Dimethylphthalate	EPA 625	<5 µg/L	01/27/2015
Di-n-Butylphthalate	EPA 625	<5 µg/L	01/27/2015
Di-n-Octylphthalate	EPA 625	<5 µg/L	01/27/2015



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ANALYTICAL & CONSULTING  
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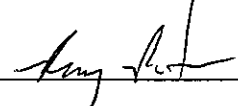
NCDENR: DWQ CERTIFICATE #94. DLS CERTIFICATE #37729

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**Report #:** 2015-00983  
**Project ID:** UNC-Bingham WWTP Effluent

Fluoranthene	EPA 625	<5 µg/L	01/27/2015
Fluorene	EPA 625	<5 µg/L	01/27/2015
Hexachlorobenzene	EPA 625	<5 µg/L	01/27/2015
Hexachlorobutadiene	EPA 625	<5 µg/L	01/27/2015
Hexachlorocyclopentadiene	EPA 625	<25 µg/L	01/27/2015
Hexachloroethane	EPA 625	<5 µg/L	01/27/2015
Indeno(1,2,3-cd)pyrene	EPA 625	<5 µg/L	01/27/2015
Isophorone	EPA 625	<5 µg/L	01/27/2015
Naphthalene	EPA 625	<5 µg/L	01/27/2015
Nitrobenzene	EPA 625	<5 µg/L	01/27/2015
N-nitroso-dimethylamine(NDMA)	EPA 625	<5 µg/L	01/27/2015
N-Nitroso-di-n-propylamine	EPA 625	<5 µg/L	01/27/2015
N-Nitroso-diphenylamine	EPA 625	<5 µg/L	01/27/2015
Phenanthrene	EPA 625	<5 µg/L	01/27/2015
Pyrene	EPA 625	<5 µg/L	01/27/2015
Chlorine	Hach 8167	<0.1 mg/L	01/23/2015
Temperature	SM 2550 B	5.6 C	01/23/2015
Dissolved Oxygen	SM 4500 O G	8.45 mg/L	01/23/2015

Comment:

Reviewed by: 



Analytical & Consulting Chemists

# ENVIRONMENTAL CHEMISTS, INC

NCDENR: DWQ CERTIFICATION # 94 NCDHHS: DLS CERTIFICATION # 37729

6602 Windmill Way Wilmington, NC 28405  
OFFICE: 910-392-0223 FAX 910-392-4424  
Info@environmentalchemists.com

## COLLECTION AND CHAIN OF CUSTODY

Client: **UNC-Chapel Hill** PROJECT NAME: **Effluent Pollutant Scan-Bingham WWTP** REPORT NO: **15-983**

ADDRESS: CONTACT NAME: **Larry Daw, UNC** PO NO:

REPORT TO: **Chuck Riley, McKim & Creed-Raleigh** PHONE/FAX:

COPY TO: email:

Sampled By: Stella Fenwick SAMPLE TYPE: I = Influent, E = Effluent, W = Well, ST = Stream, SO = Soil, SL = Sludge, Other:

Sample Identification	Collection			Sample Type	Composite or Grab	Container (P or G)	Chlorine mg/L	LAB ID NUMBER	PRESERVATION						ANALYSIS REQUESTED
	Date	Time	Temp						NONE	HCL	H2SO4	HNO3	NAOH	THIO	
Effluent	23 Feb 15	950	1005	5.6 °C	G	P		2201	X	X	X	X	X	X	NH3, NO3, NO2, TKN, Total P, TDS, Hardness
DO (field): 8.95 mg/L					G	P									Oil & Grease, metals, CN, Phenol
Chlorine: 2.01 mg/L					G	P									624, 625
(Grav)	23 Feb 15	950		5.6 °C	G	P		2202							
					G	P									
					G	P									
					G	P									
					G	P									
					G	P									
					G	P									
					G	P									
					G	P									
					G	P									

Metals: Sb, As, Be, Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, Tl, Zn

Transfer Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

1. Temperature when Received: 22 °C Accepted: \_\_\_\_\_ Resampled Requested: \_\_\_\_\_

Delivered By: SEJ Received By: Stella Fenwick Date: 1/22/15 Time: 2:32 p

Comments: \_\_\_\_\_

2. \_\_\_\_\_