



UNC
ENVIRONMENTAL
HEALTH & SAFETY

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

April 12, 2019

Ms. Janet K. Macdonald
NC DEQ Division of Waste Management
Inactive Hazardous Sites Branch
217 West Jones Street
Raleigh, North Carolina 27603

**Subject: Quarterly Update – Q1 2019
UNC Cogeneration Facility
Chapel Hill, Orange County, NC
Site ID No. NCR000010272**

Dear Ms. Macdonald:

Attached for your review is the Q1 2019 Quarterly Status Report for the subject site. Geosyntec Consultants of NC, PC, the Registered Environmental Consultant for the site, prepared the document.

Please contact me at (919) 843-5913 if you have any questions. Thank you.

Sincerely,

Mary Beth Koza
Executive Director, Environment, Health and Safety & Risk Management

Attachment

Cc: William Lowery II, PE, UNC-CH
Daniel Elliott, Geosyntec
Eric Nesbit, Geosyntec

Quarterly Status Report – Q1 2019

April 10, 2019

Reporting Period: January 1, 2019 through March 31, 2019

Site: The University of North Carolina at Chapel Hill
Cogeneration Facility
575 W. Cameron Avenue
Chapel Hill, Orange County, NC

Site ID No.: NCR000010272

Geosyntec Registered Site Manager: Eric Nesbit, P.E.

Work completed during reporting period:

- Data validation of the laboratory data results of the December 2018 monitoring event
- Gauging of groundwater monitoring wells and field surveying of surface water elevation was conducted on January 2, 2019. Summary tables of the data collected, and a figure of monitoring locations provided herein include:
 - Groundwater
 - Surface Water
 - Water Elevations

Work expected to be completed during Q2 (April - June) 2019:

- Conduct an updated receptor survey.
- Perform a risk assessment evaluation to develop alternate Remedial Goals for soil.

Schedule Compliance:

Work on this project is progressing in a satisfactory manner to achieve the mandatory work phase completion deadlines set out in 15A NCAC 13C .0302(h).

IHSB SITE NAME UNC Cogeneration Facility, Site ID No. NCR000010272

DATE & NAME OF DOCUMENT

Q1 2019

TYPE OF SUBMITTAL (circle all that apply): Report, Work plan, Work Phase Comp. Statement, Schedule Change

REMEDIATING PARTY DOCUMENT CERTIFICATION STATEMENT (.0306(B)(2))

“I certify under penalty of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information.”

Mary Beth Koza

Name of Remediating Party

Mary Beth Koza
Signature of Remediating Party

4-12-19

Date

NOTARIZATION

North Carolina (Enter State)

Wake COUNTY

I, Holly Van Norman, a Notary Public of said County and State, do hereby certify that Mary Beth Koza did personally appear and sign before me this day, produced proper identification in the form of NCDL, was duly sworn or affirmed, and declared that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 12 day of April, 2019.

Holly Van Norman
Notary Public (signature)

My commission expires: 11/15/22



IHSB SITE NAME UNC Cogeneration Facility, Site ID No. NCR000010272

DATE & NAME OF DOCUMENT Q1 2019

TYPE OF SUBMITTAL (circle all that apply): Report, Work plan, Work Phase Comp. Statement, Schedule Change

REGISTERED SITE MANAGER CERTIFICATION OF SIGNATURES

As the Registered Environmental Consultant for the Site for which this filing is made, I certify that the signatures included herewith are genuine and authentic original handwritten signatures and/or true, accurate, and complete copies of the genuine and authentic original handwritten signatures of the persons who purport to sign for this filing. I further certify that I have collected through reliable means the originals and/or copies of said signatures from the persons authorized to sign for this filing who, in fact, signed the originals thereof. Those persons and I understand and agree that any copies of signatures have the same legally binding effect as original handwritten signatures, and I certify that any person for whom I am submitting a copy of their signature has provided me with their express consent to submit said copy. Additionally, I certify that I am authorized to attest to the genuineness and authenticity of the signatures, both originals and any copies, being submitted herewith and that by signing below, I do in fact attest to the genuineness and authenticity of all the signatures, both originals and copies, being submitted for this filing.

Beau Hodge
Name of Registered Site Manager
Beau Hodge
Signature of Registered Site Manager

4/12/19
Date

REGISTERED SITE MANAGER DOCUMENT CERTIFICATION STATEMENT (.0306(b)(1))

"I certify under penalty of law that I am personally familiar with the information contained in this submittal, including any and all supporting documents accompanying this certification, and that the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete and complies with the Inactive Hazardous Sites Response Act G.S. 130A-310, et seq, and the remedial action program Rules 15A NCAC 13C .0300. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

Beau Hodge
Name of Registered Site Manager
Beau Hodge
Signature of Registered Site Manager

4/12/19
Date

NOTARIZATION

North Carolina (Enter State)

Wake COUNTY

I, Holly Van Norman, a Notary Public of said County and State, do hereby certify that Beau Hodge did personally appear and sign before me this day, produced proper identification in the form of NCDL, was duly sworn or affirmed, and declared that, he or she is the duly authorized environmental consultant of the remediating party of the property referenced above and that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certifications is true and accurate, and he or she then signed these Certifications in my presence.

WITNESS my hand and official seal this 12 day of April, 2019.

Holly Van Norman
Notary Public (signature)

My commission expires: 11/15/22.



Table 1
Groundwater Analytical Results
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

Method Type	Analyte	Units	2Ls and IMACs	Final Remediation Goals for Groundwater	Location Sample Date	MW-2						
						3/11/2014	9/9/2014	4/21/2015	11/21/2015	5/6/2016	6/14/2018	12/17/2018
Dioxins and Furans	1,2,3,4,6,7,8-Heptachloroanthrene (HpCDD)	ng/L	-	-	-	<0.00028U	0.00062J	0.00066U	<0.00054U	<0.00028U	<0.00015U	<0.00055U
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/L	-	-	-	0.0012J	0.00079J	0.00047U	0.00058J	<0.00036U	<0.00016U	<0.00038U
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/L	-	-	-	<0.00011U	0.00039J	<0.00014U	<0.00014U	<0.00049U	<0.00019U	<0.00056U
	1,2,3,4,7,8-Hexachloroanthrene (HxCDD)	ng/L	-	-	-	<0.00034U	<0.00011U	0.00072J	<0.00036U	<0.00018U	<0.00057U	<0.00036U
	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/L	-	-	-	<0.00036U	<0.00011U	<0.00005U	<0.00026U	<0.00016U	<0.00011U	<0.00035U
	1,2,3,6,7,8-Hexachloroanthrene (HxCDD)	ng/L	-	-	-	<0.00032U	<0.00012U	0.00039J	<0.00036U	<0.00018U	<0.00058U	<0.00038U
	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/L	-	-	-	<0.00034U	<0.00011U	0.00015U	0.00057J	<0.00016U	<0.00012U	<0.00034U
	1,2,3,7,8,9-Hexachloroanthrene (HxCDD)	ng/L	-	-	-	0.0011J	<0.00011U	<0.000064U	<0.00034U	<0.00017U	<0.00053U	<0.00035U
	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/L	-	-	-	<0.00035U	0.0004J	<0.000059U	<0.00031U	<0.00023U	<0.00014U	<0.00044U
	2,3,7,8-Tetrachloroanthrene (TCDD)	ng/L	0.0002	-	-	<0.00017U	<0.000041U	<0.000013U	<0.00019U	<0.00022U	<0.0036U	<0.00047U
	1,2,3,7,8-Pentachloroanthrene (PeCDD)	ng/L	-	-	-	<0.00012U	<0.000051U	0.00045U	<0.00086U	<0.000091U	<0.0012U	<0.00033U
	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/L	-	-	-	0.001J	<0.00012U	<0.000025U	<0.00018U	<0.00016U	<0.00058U	<0.00033U
	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/L	-	-	-	<0.00034U	<0.00011U	<0.000054U	<0.00027U	<0.00017U	<0.00012U	<0.00037U
	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/L	-	-	-	<0.00033U	0.00021J	<0.000025U	<0.00016U	<0.00015U	<0.00056U	<0.00031U
	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/L	-	-	-	<0.0001U	<0.000065U	<0.000027U	<0.0001U	<0.00017U	<0.0017U	<0.00039U
	1,2,3,4,6,7,8,9-Octachloroanthrene (OCDD)	ng/L	-	-	-	0.0082J	0.007J	0.0033U	0.0024J	<0.0024U	<0.00029U	<0.110U
	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/L	-	-	-	<0.00023U	0.0039J	0.0092U	0.0016J	<0.0017U	<0.00086U	<0.00037U
	Calculated Dioxin/Furan TEQ	ng/L	0.0002	-	0.0002	0.00015446	0.00012427	0.000111	0.000064	ND	ND	ND
Calculated Hexachlorodibenzo-p-dioxin, Mixture	ng/L	-	-	-	0.00011	ND	0.00011	ND	ND	ND	ND	
SVOCs	1-Methylnaphthalene	µg/L	1	-	-	<0.0054U	<0.0056U	<0.0054U	<0.0054U	<0.0054U	<0.0058U	R
	2-methylnaphthalene	µg/L	30	-	-	<0.0049U	<0.0051U	<0.0049U	<0.0049U	<0.0049U	<0.0053U	R
	Acenaphthene	µg/L	80	-	-	<0.01U	<0.011U	<0.01U	<0.01U	<0.01U	<0.011U	R
	Acenaphthylene	µg/L	200	-	-	<0.0095U	<0.0099U	<0.0095U	<0.0096U	<0.0094U	<0.01U	R
	Anthracene	mg/L	2	-	-	<0.000013U	<0.000014U	<0.000014U	<0.000014U	<0.000013U	<0.00015U	R
	Benzo(a)anthracene	µg/L	0.05	-	-	<0.003U	<0.0032U	<0.0031U	<0.0031U	<0.0030U	<0.0033U	<0.110U
	Benzo(a) pyrene	µg/L	0.005	0.005	-	<0.0049U	<0.0051U	<0.0049U	<0.0049U	<0.0049U	<0.0053U	<0.110U
	Benzo(b)fluoranthene	µg/L	0.05	-	-	<0.0033U	<0.0034U	<0.0033U	<0.0033U	<0.0033U	<0.0036U	<0.110U
	Benzo(g,h,i)perylene	µg/L	200	-	-	<0.0034U	<0.0035U	<0.0034U	<0.0034U	<0.0034U	<0.0037U	<0.110U
	Benzo(k)fluoranthene	µg/L	0.5	-	-	<0.0048U	<0.005U	<0.0048U	<0.0048U	<0.0048U	<0.0052U	0.0057J
	Chrysene	µg/L	5	-	-	<0.003U	<0.0032U	<0.003U	<0.0031U	<0.003U	<0.0033U	<0.110U
	Dibenz(a,h)anthracene	µg/L	0.005	0.005	-	<0.0046U	<0.0048U	<0.0046U	<0.0046U	<0.0046U	<0.005U	R
	Fluoranthene	µg/L	300	-	-	<0.0043U	<0.0045U	<0.0043U	<0.0043U	<0.0043U	<0.1U	<0.110U
	Fluorene	µg/L	300	-	-	<0.018U	<0.019U	<0.018U	<0.018U	<0.018U	<0.019U	R
	Indeno(1,2,3-c,d)pyrene	µg/L	0.05	0.05	-	<0.014U	<0.015U	<0.014U	<0.014U	<0.014U	<0.015U	R
	Naphthalene	µg/L	6	-	-	<0.0051U	0.031J	<0.0051U	<0.0051U	<0.0051U	0.0086J	0.0067J
	Phenanthrene	µg/L	200	-	-	<0.0093U	<0.0096U	<0.0093U	<0.0094U	<0.0092U	<0.01U	R
	Pyrene	µg/L	200	-	-	<0.0077U	<0.008U	<0.0077U	<0.0078U	<0.0077U	<0.0083U	<0.110U
	PAH TEQ	µg/L	0.005	0.005	-	ND	ND	ND	ND	ND	ND	0.000057
	General Chemistry	Bromide	mg/L	-	-	-	-	-	-	-	<0.11U	<0.11U
		Bicarbonate as CaCO3	mg/L	-	-	-	140	-	-	-	-	-
Total Inorganic Carbon		mg/L	-	-	-	-	-	-	-	1.5	22	
Dissolved Organic Carbon		mg/L	-	-	-	-	-	-	-	1.5	1.7B	
Chloride		mg/L	250	-	-	19	-	-	11B	-	17	11B
Fluoride		mg/L	2	-	-	-	-	-	-	0.4J	0.47J	
Nitrate		mg/L	10	-	-	-	-	-	-	0.051J	0.12J	
Nitrite		mg/L	1	-	-	-	-	-	-	<0.049U	<0.049U	
Orthophosphate		mg/L	-	-	-	-	-	-	-	<0.19U	<0.19U^	
Sulfate		mg/L	250	250	-	170	140	120B	90B	85	99	96B
Sulphide		mg/L	-	-	-	<0.79U	-	-	-	-	-	-
TDS		mg/L	500	500	-	400	320	300	250	530	280	260
TSS	mg/L	-	-	-	<1.1U	-	-	-	-	-	-	
Metals	Aluminium	mg/L	-	-	-	<0.018U	<0.018U	<0.018U	<0.018U	<0.018U	-	-
	Antimony	mg/L	0.001	-	-	<0.0031U	<0.0031U	<0.0031U	<0.0031U	<0.0031U	-	-
	Arsenic	ug/L	10	-	-	<4.4U	6.5J	<4.4U	5J	<4.4U	-	-
	Barium	ug/L	700	-	-	87	53	57B	39J	50	-	-
	Beryllium	mg/L	0.004	-	-	<0.00047U	<0.00047U	<0.00047U	<0.00047U	<0.00047U	-	-
	Cadmium	ug/L	2	-	-	<0.45U	<0.45U	<0.45U	<0.45U	<0.45U	-	-
	Calcium	mg/L	-	-	-	31	24	22	15	17	16	15
	Chromium (III+VI)	ug/L	10	10	-	<0.66U	<0.66U	<0.66U	2.7J	<0.66U	<0.66U	0.74J
	Hexavalent Chromium (VI)	ug/L	-	-	-	-	-	-	-	-	-	-
	Cobalt	mg/L	0.001	0.001	-	0.032	0.028	0.033	0.023	0.029	0.03	0.024
	Copper	mg/L	1	-	-	<0.0014U	0.0014J	<0.0014U	<0.0014U	<0.0014U	<0.0042U	-
	Iron	ug/L	300	578	-	<22U	340	190	140	560J	630	100
	Lead	µg/L	15	-	-	<2.6U	<2.6U	<2.6U	<2.6U	<2.6U	-	-
	Magnesium	mg/L	-	-	-	7	5.9	5.6	3.7	3.8	3.7B	3.7
	Manganese	ug/L	50	70	-	6,400	5700	6,000	3,800B	4400B	4,600	3,900B
	Mercury	ug/L	1	-	-	<0.027U	<0.027U	<0.027U	<0.027U	-	-	-
	Nickel	ug/L	100	-	-	5.5J	4.1J	5.9J	2.9J	3.8J	-	-
	Potassium	mg/L	-	-	-	3.5	3	3.6	2.7J	3.1B	2.8J	2.6J
	Selenium	ug/L	20	-	-	<4.9U	<4.9U	<4.9U	<4.9U	<4.9U	-	-
	Silver	ug/L	20	-	-	1.2J	2.3J	<0.93U	<0.93U	<0.93U	-	-
	Sodium	mg/L	-	-	-	99J	69	75	62B	66B	75B	61
	Thallium	mg/L	0.0002	-	-	<0.0049U	<0.0049U	<0.0049U	0.0072J	<0.0049U	-	-
	Vanadium	mg/L	0.0003	0.0003	-	<0.0011U	<0.0011U	<0.0011U	0.0017J	<0.0011U	0.0017J	<0.0011U
	Zinc	mg/L	1	-	-	<0.02U	0.0062J	0.093	0.005J	0.0096J	-	-

Table 1
Groundwater Analytical Results
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

Method Type	Analyte	Units	2Ls and IMACs	Final Remediation Goals for Groundwater	Location Sample Date	PZAW-4						
						9/10/2014	4/21/2015	11/19/2015	5/6/2016	6/13/2018	12/13/2018	
Dioxins and Furans	1,2,3,4,6,7,8-Heptachlorooxanthrene (HpCDD)	ng/L	-	-		<0.00013U	0.00056U	<0.00017U	<0.00025U	<0.00012U	<0.00021U	
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/L	-	-		<0.000053U	0.001U	<0.00005U	<0.000075U	<0.051U	<0.000044U	
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/L	-	-		<0.00019U	<0.00016U	<0.00069U	<0.00005U	<0.00027U	<0.000060U	
	1,2,3,4,7,8-Hexachlorooxanthrene (HxCDD)	ng/L	-	-		<0.00011U	<0.00013U	<0.00011U	<0.00015U	<0.0014U	<0.00011U	
	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/L	-	-		<0.00011U	<0.00007U	<0.00011U	<0.00018U	<0.00062U	<0.00022U	
	1,2,3,6,7,8-Hexachlorooxanthrene (HxCDD)	ng/L	-	-		<0.00011U	0.00033J	<0.00011U	<0.00015U	<0.0017U	<0.00011U	
	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/L	-	-		<0.0001U	<0.000071U	<0.0001U	<0.00016U	<0.00061U	<0.00021U	
	1,2,3,7,8,9-Hexachlorooxanthrene (HxCDD)	ng/L	-	-		<0.0001U	<0.00012U	<0.00041U	<0.00014U	<0.0014U	<0.00010U	
	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/L	-	-		<0.00038U	<0.000088U	<0.00013U	<0.00024U	<0.00081U	<0.00028U	
	2,3,7,8-Tetrachlorooxanthrene (TCDD)	ng/L	0.0002	-	-	<0.000095U	<0.000035U	<0.00012U	<0.00017U	<0.0045U	<0.0015U	
	1,2,3,7,8-Pentachlorooxanthrene (PeCDD)	ng/L	-	-	-	<0.000026U	<0.00028U	<0.0001U	<0.00011U	<0.00072U	<0.00039U	
	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/L	-	-	-	<0.000087U	<0.000047U	<0.000086U	<0.00015U	<0.00071U	<0.00030U	
	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/L	-	-	-	<0.00026U	0.00034U	<0.00011U	<0.00018U	<0.00069U	<0.00021U	
	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/L	-	-	-	<0.00008U	<0.00005U	<0.00008U	<0.00014U	<0.00065U	<0.00029U	
	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/L	-	-	-	<0.000041U	<0.000028U	<0.000095U	<0.00013U	<0.0022U	<0.00063U	
	1,2,3,4,6,7,8,9-Octachlorooxanthrene (OCDD)	ng/L	-	-	-	<0.0054U	<0.0036U	<0.0021U	0.005J	<0.00076U	<0.110U	
	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/L	-	-	-	<0.002U	<0.0072U	<0.00036U	<0.00092U	<0.0015U	<0.00055U	
	Calculated Dioxin/Furan TEQ	ng/L	0.0002	-	0.0002	ND	0.000033	ND	0.0000015	ND	ND	
	Calculated Hexachlorodibenzo-p-dioxin, Mixture	ng/L	-	-	-	ND	0.00033	ND	ND	ND	ND	
	SVOCs	1-Methylnaphthalene	µg/L	1	-		<0.0054U	<0.0056U	<0.0054U	<0.0054U	<0.0059U	<0.0065U
		2-methylnaphthalene	µg/L	30	-		<0.0049U	<0.0051U	<0.0049U	<0.0049U	<0.0053U	<0.0059U
Acenaphthene		µg/L	80	-		<0.01U	<0.011U	<0.01U	<0.01U	<0.011U	<0.012U	
Acenaphthylene		µg/L	200	-		<0.0095U	<0.0098U	<0.0096U	<0.0095U	<0.01U	<0.011U	
Anthracene		mg/L	2	-		<0.000014U	<0.000014U	<0.000014U	<0.000014U	<0.000015U	<0.000016U	
Benz(a)anthracene		µg/L	0.05	-		<0.0031U	<0.0032U	<0.0031U	<0.0031U	<0.0033U	<0.120U	
Benzo(a) pyrene		µg/L	0.005	0.005		<0.0049U	<0.0051U	<0.0049U	<0.0049U	<0.0053U	<0.120U	
Benzo(b)fluoranthene		µg/L	0.05	-		<0.0033U	<0.0034U	<0.0033U	<0.0033U	<0.0036U	<0.120U	
Benzo(g,h,i)perylene		µg/L	200	-		<0.0034U	<0.0035U	<0.0034U	<0.0034U	<0.0037U	0.019J	
Benzo(k)fluoranthene		µg/L	0.5	-		<0.0048U	<0.005U	<0.0048U	<0.0048U	<0.0052U	0.015J	
Chrysene		µg/L	5	-		<0.0031U	<0.0031U	<0.0031U	<0.003U	<0.0033U	<0.120U	
Dibenz(a,h)anthracene		µg/L	0.005	0.005		<0.0046U	<0.0048U	<0.0046U	<0.0046U	<0.005U	0.017J	
Fluoranthene		µg/L	300	-		<0.0043U	<0.0045U	<0.0043U	<0.0043U	<0.0047U	<0.120U	
Fluorene		µg/L	300	-		<0.018U	<0.019U	<0.018U	<0.018U	<0.019U	<0.022U	
Indeno(1,2,3-c,d)pyrene		µg/L	0.05	0.05		<0.014U	<0.014U	<0.014U	<0.014U	<0.015U	0.025J	
Naphthalene		µg/L	6	-		<0.0051U	<0.0053U	<0.0051U	<0.0051U	0.007J	<0.0061U	
Phenanthrene		µg/L	200	-		<0.0093U	<0.0096U	<0.0094U	<0.0093U	<0.01U	<0.011U	
Pyrene		µg/L	200	-		<0.0077U	<0.008U	<0.0078U	<0.0077U	<0.0084U	<0.0093U	
PAH TEQ		µg/L	0.005	0.005		ND	ND	ND	ND	ND	0.02145	
General Chemistry		Bromide	mg/L	-	-		-	-	-	-	<0.11U	<0.11U
		Bicarbonate as CaCO3	mg/L	-	-		-	-	-	-	-	-
	Total Inorganic Carbon	mg/L	-	-		-	-	-	6.7	13J+	-	
	Dissolved Organic Carbon	mg/L	-	-		-	-	-	0.28J	<1.0U	-	
	Chloride	mg/L	250	-		-	-	-	<3U	<3.0U	-	
	Fluoride	mg/L	2	-		-	-	-	<0.06U	<0.06U	-	
	Nitrate	mg/L	10	-		-	-	-	1.3	1.1	-	
	Nitrite	mg/L	1	-		-	-	-	<0.049U	<0.049U	-	
	Orthophosphate	mg/L	-	-		-	-	-	<0.19UF1	0.81J+	-	
	Sulfate	mg/L	250	250		53	62B	73B	21	16B	9.7B	
	Sulphide	mg/L	-	-		-	-	-	-	-	-	
	TDS	mg/L	500	500		140	140	170	81	62	70	
	TSS	mg/L	-	-		-	-	-	-	-	-	
Metals	Aluminium	mg/L	-	-		0.022J	0.046J	0.046J	0.88	-	-	
	Antimony	mg/L	0.001	-		<0.0031U	<0.0031U	<0.0031U	<0.0031U	-	-	
	Arsenic	ug/L	10	-		<4.4U	<4.4U	7.1J	<4.4U	-	-	
	Barium	ug/L	700	-		34	32B	41	46	-	-	
	Beryllium	mg/L	0.004	-		<0.00047U	<0.00047U	<0.00047U	<0.00047U	-	-	
	Cadmium	ug/L	2	-		<0.45U	<0.45U	<0.45U	<0.45U	-	-	
	Calcium	mg/L	-	-		14	15	20	7	6.4	5.8	
	Chromium (III+VI)	ug/L	10	10		19	26	29	16	8.7J	8.3J	
	Hexavalent Chromium (VI)	ug/L	-	-		-	-	-	-	8.8J	7.6B	
	Cobalt	mg/L	0.001	0.001		<0.0012U	<0.0012U	<0.0012U	<0.0012U	<0.0012U	<0.0012U	
	Copper	mg/L	1	-		0.0017J	<0.0014U	<0.0014U	<0.0042U	-	-	
	Iron	ug/L	300	578		<22U	35J	70J	680J	<22U	<22U	
	Lead	µg/L	15	-		<2.6U	<2.6U	<2.6U	<2.6U	-	-	
	Magnesium	mg/L	-	-		4.1	4.5	5.5	2.1	1.7	1.5	
	Manganese	ug/L	50	70		7.7J	4.3J	4U	22B	1.4J	1.1J	
	Mercury	ug/L	1	-		<0.027U	<0.027U	<0.027U	<0.027U	-	-	
	Nickel	ug/L	100	-		1.8J	2.3J	<1.3U	<1.3U	-	-	
	Potassium	mg/L	-	-		3.6	3.8	3.8	3.3B	2.8J	2.8J	
	Selenium	ug/L	20	-		<4.9U	5J	<4.9U	<4.9U	-	-	
	Silver	ug/L	20	-		<0.93U	<0.93U	<0.93U	<0.93U	-	-	
	Sodium	mg/L	-	-		15	15	14B	11	6.3	6	
Thallium	mg/L	0.0002	-		<0.0049U	<0.0049U	0.0067J	<0.0049U	-	-		
Vanadium	mg/L	0.0003	0.0003		<0.0011U	<0.0011U	<0.0011U	0.0012J	<0.0011U	<0.0011U		
Zinc	mg/L	1	-		0.0088J	0.0076J	0.0075J	0.0077J	-	-		

Table 1
Groundwater Analytical Results
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

Notes:

1. ng/L indicates nanogram per liter.
2. mg/L indicates milligram per liter.
3. µg/L indicates microgram per liter.
4. TEQ indicates total equivalents.
5. U indicates result was below the method detection limit.
6. J indicates results is an estimate.
7. UJ indicates the analyte was not detected above the method detection limit. However, the method detection limit is an approximation.
8. B is a laboratory flag indicating compound was detected in both the method blank and sample
9. R indicates the results are rejected due to deficiencies in the ability to analyze the sample and meet quality control criteria. The presence of the analyte cannot be verified.
10. F1 & F2 are data qualifiers used by the laboratory.
11. TDS indicates total dissolved solids.
12. TSS indicates total suspended solids.
13. PAH indicates polyaromatic hydrocarbon.
14. ND indicates all of the input parameters in the calculated parameter equation were non-detect.
15. Groundwater Final Remediation Goals reference Geosyntec's 2016 Remedial Investigation Report.
16. NCDENRs 2L and IMAC standards from April 1, 2013.
17. Highlighted concentrations are exceedences of the Groundwater Final Remediation Goals.

Table 2
Surface Water Analytical Results
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

Method Type	Analyte	Units	Human Health Surface Water Benchmark	Ecological Risk Surface Water Benchmark	Location	SW-UP	SW-DOWN	SW-UP	SW-DOWN
					Sample Date	6/14/2018	6/14/2018	12/12/2018	12/12/2018
Dioxins and Furans	1,2,3,4,6,7,8-Heptachlorooxanthrene (HpCDD)	ng/L	-	-		0.0034J	0.066	0.0018J	<0.00064U
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/L	-	-		<0.00034U	<0.049U	<0.054U	<0.0005U
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/L	-	-		<0.00039U	<0.00015U	<0.00031U	<0.00067U
	1,2,3,4,7,8-Hexachlorooxanthrene (HxCDD)	ng/L	-	-		<0.00056U	<0.00028U	<0.00037U	<0.00057U
	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/L	-	-		<0.00035U	<0.00079U	<0.00029U	<0.00052U
	1,2,3,6,7,8-Hexachlorooxanthrene (HxCDD)	ng/L	-	-		<0.00059U	<0.00032U	<0.00039U	<0.00059U
	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/L	-	-		<0.00035U	0.0023J	<0.00029U	<0.00051U
	1,2,3,7,8,9-Hexachlorooxanthrene (HxCDD)	ng/L	-	-		<0.00053U	0.0027J	<0.00036U	<0.00054U
	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/L	-	-		<0.00041U	<0.001U	<0.00038U	<0.00072U
	2,3,7,8-Tetrachlorooxanthrene (TCDD)	ng/L	-	-		<0.0031U	<0.0029U	<0.00051U	<0.00058U
	1,2,3,7,8-Pentachlorooxanthrene (PeCDD)	ng/L	-	-		<0.00055U	<0.00039U	<0.00022U	<0.00049U
	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/L	-	-		<0.0004U	<0.00045U	<0.00062U	<0.00063U
	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/L	-	-		<0.00036U	<0.00088U	<0.00031U	<0.00057U
	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/L	-	-		<0.00036U	<0.00043U	<0.00057U	<0.0006U
	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/L	-	-		<0.002U	<0.0016U	<0.00057U	<0.00083U
	1,2,3,4,6,7,8,9-Octachlorooxanthrene (OCDD)	ng/L	-	-		<0.098U	0.37B	<0.110U	<0.110U
	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/L	-	-		<0.098U	<0.098U	<0.110U	<0.110U
	Calculated Dioxin/Furan TEQ	ng/L	0.000005	0.01		0.000034	0.001271	0.000018	ND
	Calculated Hexachlorodibenzo-p-dioxin, Mixture	ng/L	-	-		ND	0.00027	ND	ND
	SVOCs	1-Methylnaphthalene	µg/L	-		-	<0.0055U	<0.0056U	<0.0064U
2-methylnaphthalene		µg/L	-	-	<0.005U	<0.0051U	<0.0058U	<0.0057U	
Acenaphthene		µg/L	-	-	<0.011U	<0.011U	<0.012U	<0.012U	
Acenaphthylene		µg/L	-	-	<0.0098U	<0.0098U	<0.011U	<0.011U	
Anthracene		mg/L	-	-	<0.000014U	<0.000014U	<0.000016U	<0.000016U	
Benz(a)anthracene		µg/L	-	-	0.014J	0.009J	0.0068J	0.006J	
Benzo(a) pyrene		µg/L	0.0311	0.014	0.013J	0.0088J	0.0064J	<0.0056U	
Benzo(b)fluoranthene		µg/L	-	-	0.019J	0.011J	0.013J	<0.0038U	
Benzo(g,h,i)perylene		µg/L	-	-	0.0076J	<0.0035U	<0.004U	<0.0039U	
Benzo(k)fluoranthene		µg/L	-	-	0.017J	0.014J	0.0059J	<0.0055U	
Chrysene		µg/L	-	-	0.021J	0.013J	0.013J	0.0073J	
Dibenz(a,h)anthracene		µg/L	0.0311	-	<0.0047U	<0.0048U	<0.0054U	<0.0053U	
Fluoranthene		µg/L	-	-	<0.098U	<0.099U	0.017J	0.0093J	
Fluorene		µg/L	-	-	<0.018U	<0.019U	<0.021U	<0.021U	
Indeno(1,2,3-c,d)pyrene		µg/L	0.0311	4.31	<0.014U	<0.014U	<0.017U	<0.016U	
Naphthalene		µg/L	-	-	<0.0052U	<0.0053U	0.0071J	0.0068J	
Phenanthrene		µg/L	-	-	0.022J	0.019J	0.014J	<0.011U	
Pyrene		µg/L	-	-	0.029J	0.025J	0.016J	0.0091J	
PAH TEQ		µg/L	0.0311	0.014	0.01649	0.010953	0.00845	0.0006073	
General Chemistry		TDS	mg/L	500	-	170	170	<4.7U	260
	Chromium (III+VI)	ug/L	100	50	1J	0.72J	<10U	<10U	
Metals	Cobalt	mg/L	0.004	0.003	<0.0012U	<0.0012U	<0.0012U	<0.0012U	
	Iron	ug/L	14000	1000	650	200	370	210	
	Manganese	ug/L	100	80	50	17	51B	20B	
	Vanadium	mg/L	0.0172	0.019	<0.0011U	<0.0011U	<0.0011U	<0.0011U	

Table 2
Surface Water Analytical Results
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

Notes:

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2. mg/L indicates milligram per liter.
3. µg/L indicates microgram per liter.
4. TEQ indicates total equivalents.
5. U indicates result was below the method detection limit.
6. J indicates results is an estimate.
7. B is a laboratory flag indicating compound was detected in both the method blank and sample
8. TDS indicates total dissolved solids.
9. PAH indicates polyaromatic hydrocarbon.
10. ND indicates all of the input parameters in the calculated parameter equation were non-detect.
11. Benchmarks were established in the *Sediment / Surface Water Screening Report* (Geosyntec, October 2015).
12. Highlighted concentrations are exceedences of a Benchmark.

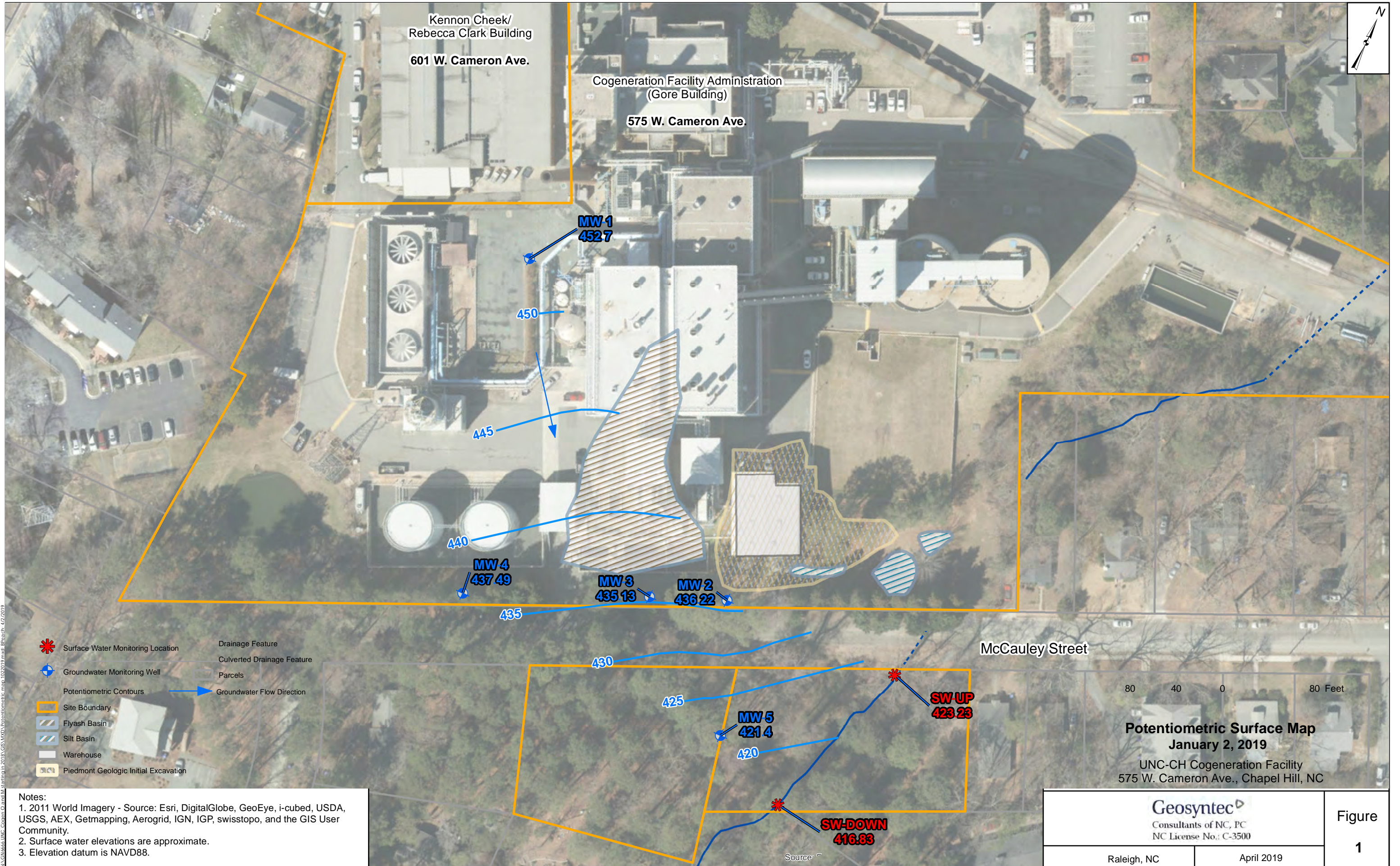
Table 3
Groundwater and Surface Water Elevations
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

Location	TOC Elevation (ft NAVD88)	1/2/2019	
		DTW (ft BTOC)	Groundwater Elevation (ft NAVD88)
MW-1	477.05	24.35	452.7
MW-2	447.53	11.31	436.22
MW-3	447.15	12.02	435.13
MW-4/PZ-4	458.42	20.93	437.49
MW-5	426.07	4.67	421.4

Location	1/2/2019	
	Approx. Benchmark Elevation (ft NAVD88)	Approx. Surface Water Elevation (ft NAVD88)
SW-UP	424.81	423.23
SW-DOWN	419.45	416.83

Notes:

1. ft indicates feet.
2. BGS indicates below ground surface.
3. NAVD88 indicates North America Vertical Datum 1988.
4. BTOC indicates below top of casing.



Notes:
 1. 2011 World Imagery - Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.
 2. Surface water elevations are approximate.
 3. Elevation datum is NAVD88.

Potentiometric Surface Map
 January 2, 2019
 UNC-CH Cogeneration Facility
 575 W. Cameron Ave., Chapel Hill, NC

Geosyntec Consultants of NC, PC NC License No.: C-3500		Figure 1
Raleigh, NC	April 2019	

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