JANUARY 2016 ANNUAL SAMPLING REPORT
FORMER RITTER MILLWORKS SITE
CASTLE HAYNE, NEW HANOVER COUNTY, NORTH CAROLINA
IHSB INCIDENT NO.: NONCD002404

Prepared for:
RITTER-MARKET, LLC
MR. PAGE TEER
MR. JERE FREEMAN
2509 KINGSLEY ROAD
WILMINGTON, NORTH CAROLINA

Prepared by:
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ECS Carolinas, LLP Project No. 49-1213

February 25, 2016

ECS CAROLINAS, LLP

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February 25, 2016

Mr. Page Teer
Mr. Jere Freeman
Ritter-Market
2509 Kingsley Road
Wilmington, North Carolina 28405

Reference: Report of Annual Groundwater Monitoring – January 2016 Event
Former Ritter Millworks Site
2913 Castle Hayne Road
Castle Hayne, New Hanover County, North Carolina
IHSB Incident No.: NONCD0002404
ECS Project No. 49-1213

Dear Mr. Teer and Freeman:

As authorized by your acceptance of our Proposal No. 22-20264, dated November 9, 2015, ECS Carolinas, LLP (ECS) has completed the annual environmental assessment activities for the above referenced site for January 2016. Included in this report is a description of the field activities, the results obtained, and our conclusions and recommendations.

The activities and evaluative approaches used in this assessment are consistent with those normally employed in assessment and remediation projects of this type. Our evaluation of site conditions has been based on our understanding of the project information and the data obtained during our field activities.

ECS is pleased to have the opportunity to offer our services and look forward to working with you on this project. If you have any questions or comments concerning the contents of the enclosed documents, please contact us at (910) 686-9114.

Sincerely,

ECS Carolinas, LLP

Amy C. Conchas, REM
Environmental Principal

John Stewart, P.G. 046
Chief Geologist

NORTH CAROLINA LICENSED GEOLOGIST JOHN M. STEWART 2125 2016

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1.0 INTRODUCTION

The subject site is the former Ritter Millworks facility site located at 2913 Castle Hayne Road in Castle Hayne, New Hanover County, North Carolina (Figure 1). ECS was provided with a copy of the 2011 Annual Summary Report prepared by AMEC. According to the report, the property was utilized as a mill working shop and window manufacturing facility since the early 1950's. A dip vat was reportedly used to store a varsol/pentachlorophenol (PCP) solution (Figure 2). The process involved dipping the completed woodworks into the vat to remove sawdust and treat the wood with a fungicide and preservative.

In July 2004, Fenton's reagent was used as a remedial method to oxidize PCP in the groundwater. Field activities included injecting hydrogen peroxide and ferrous iron at the former dip vat location, near the MW-6 and MW-4 well nests (Figure 2). The injection was successful in decreasing concentrations of PCP. In all, 22 groundwater monitoring wells have been installed to monitor the movement of the PCP plume; including 11 water table wells (MW-1s through MW-9s and MW-11 and MW-12), nine intermediate wells, (MW-1d through MW-7d and MW-9i, MW-10i, and MW-11i), and two deeper wells (MW-5 and MW-8).

The former Ritter Millworks site was transferred to the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Waste Management, Superfund Section, Inactive Hazardous Sites Branch (IHSB). Morehead Builders Supply, Inc. entered into an Administrative Agreement to address the future remedial course of the site. In March 2010, AMEC Environment & Infrastructure, Inc. (AMEC) submitted a Remedial Action (RAP) to the IHSB for approval. The IHSB approved the RAP on July 21, 2010, which outlined a monitoring Natural Attenuation (MNA) remedial option for the site. AMEC was contracted by Morehead Builders Supply Company (Morehead) to implement MNA by conducting a groundwater monitoring event and preparing an Annual Summary Report.

The responsible party for the site was previously listed as Morehead Builders Supply, Inc. As of December 30, 2011, the liability was transferred to Ritter-Market, LLC. The IHSB was notified of this change to the site Administrative Agreement in a letter dated December 30, 2011. ECS Carolinas, LLP (ECS) was contracted by Ritter-Market, LLC to continue the annual groundwater monitoring event and reporting. ECS was not involved with the installation of the on-site monitoring wells or preparing of the RAP and can not attest the quality of the on-site monitoring wells or prior activities performed at the site. This report summarizes the field activities and results obtained during the January 2016 annual groundwater monitoring event and a plan for remedy re-evaluation.

2.0 FIELD ACTIVITIES

2.1 Water Level Measurements

ECS personnel mobilized to the site on January 6, 2016, to conduct an annual groundwater monitoring event which included gauging the 22 on-site groundwater monitoring wells and sampling five select on-site groundwater monitoring wells. Monitoring well MW-9s was unable to be located and appeared to have been destroyed during construction of an additional building to the north of the site. Initially, the monitoring well caps were opened to allow the water levels

to equilibrate. ECS measured the depth-to-water in each monitoring well using an electronic water level indicator (Table 1). Groundwater flow direction in the surficial aquifer was determined by the development of a potentiometric groundwater contour map (Figure 3). Interpretation of the water level data suggests that the average water table gradient is approximately 0.011 foot per foot (ft/ft) between wells MW-2s and MW-7s, and the groundwater flow is predominantly toward the west. This flow direction is consistent with that measured during previous sampling events.

Potentiometric head pressures vary significantly in wells screened in the intermediate zone. This variation is noted between monitoring wells located in the upper and lower zones of the intermediate aquifer zone. Evidence of these variations are noted by the groundwater elevations recorded for wells MW-2d, MW-3d, MW-4d, and MW-6d (upper intermediate zones wells), which are completed shallower than the lower intermediate aquifer zone wells (i.e., MW-1d, MW-7d, MW-9i, MW-10i, and MW-11i). Similar to the previous sampling event, during this period groundwater appears to be flowing toward the west and south in a semi-radial pattern (Figure 4).

2.2 Vertical Hydraulic Gradient

Groundwater exhibits both horizontal and vertical components of flow through an aquifer. At the project site there are several well clusters which pair a shallow monitoring well with an intermediate or deeper groundwater monitoring well. The vertical gradients determined for the site are summarized in Table 2. Based upon water level data collected on January 6, 2016, a downward vertical gradient exists between the shallow aquifer and the portion of the aquifer below the silt unit present at approximately 20 feet below land surface. The downward vertical gradients range from -0.37 ft/ft (MW-6s/MW-8) to -0.90 (MW-1s/MW-1d).

2.3 Groundwater Sampling Activities

ECS collected groundwater samples from monitoring wells MW-4s, MW-4d, MW-6s, MW-6d, MW-7s, and MW-10s on January 7, 2016, in accordance with the approved RAP. The groundwater samples were collected using low-flow sampling techniques to allow measurement of stabilized water quality parameters including conductivity, dissolved oxygen, pH, oxidation reduction potential, temperature, and turbidity. These measurements are necessary to insure collection of representative samples. Low-flow purging and sampling procedures were conducted in accordance with the USEPA Region IV Field Branches Quality System and Technical Procedures, “Groundwater Sampling” dated November 1, 2007 (http://www.epa.gov/region4sesd/fbqstp/). Field notes and observations recorded during activities are included in Appendix A.

Each well was purged and sampled with a peristaltic pump or a QED SampPro bladder pump using dedicated tubing. Water quality parameters were measured with a YSI 556 MPS meter and flow-through cell assembly and Hanna 98703 Turbidity meter. Groundwater samples were placed in pre-labeled, laboratory-supplied containers, placed on ice, and transported under chain-of-custody for analysis by the laboratory. In order to obtain a detection limit below the established North Carolina 2L Groundwater standard (2L Standard) of 0.3 micrograms per liter (ug/l), groundwater samples were submitted to Pace Analytical Services, Inc. of Huntersville,

North Carolina for analyses. These samples were analyzed for the presence of PCP according to EPA SW-846 Method 8151.

2.4 Drum Sampling Activities

ECS was requested to dispose of the on-site drums containing purged water from the annual groundwater sampling events. ECS collected a water sample from a drum (Drum-1), the water was analyzed for PCP using EPA Method 8151 and volatile organic compounds using EPA Method 8260. The sample was placed in pre-labeled, laboratory-supplied containers, placed on ice, and transported under chain-of-custody for analysis by the laboratory. The analytical results did not detect VOCs above their respective laboratory detection limits. Analysis detected PCP in Drum-1 at a concentration of 4.4 ug/l. Analytical results are provided in Appendix B and summarized in Table 4

2.5 Water Supply Well Verification

As requested by Mr. Dave Brown with North Carolina Department of Environmental Quality (NCDEQ), ECS visited the adjoining property, 106 Ritter Drive, in order to verify the status of the water supply well that was previously identified**.** On January 7, 2016, ECS spoke with Mr. Rich Randall who was present on the property. He informed ECS that the property is owned by Ms. Linda Allen and that there are two water supply wells on the property. One well is located by Ritter Drive that is an irrigation well and is no longer in service. The second water supply well is located in the back yard (to the west of the site source) and is currently being used as the primary water source.

3.0 LABORATORY ANALYTICAL RESULTS

Laboratory analytical results for groundwater samples are contained in Appendix B and summarized in Tables 3 and 4, and on Figures 5 and 6. As summarized, PCP was detected in five of the six samples collected. Two of the six monitoring wells contained PCP at a concentration exceeding the 2L standard. These include intermediate monitoring wells MW-4d (17.1 ug/l) and MW-6d (24.4ug/l).

Concentrations of PCP in well MW-4d decreased dramatically in 2004 following the injection of the Fenton's reagent. Since 2007 the concentration has stabilized with a slight but steady increase in concentration. The concentration of PCP in shallow well 6s has fluctuated since 2004 but has decreased steadily since 2011. Graphs showing the PCP concentration changes over time for wells MW-4s and MW-4d are included in Appendix C.

One QA/QC sample was collected for groundwater sampling activities. The QA/QC sample, MW-7s was collected on January 7, 2016. The QA/QC sample was analyzed for PCP using EPA Method 8015. Results for the sample indicated PCP at a concentration similar to that of its duplicate. MW-7s did not detect concentrations above laboratory detection limits (<0.028ug/l), and a concentration of 0.035 ug/l was detected in the Duplicate.

4.0 SUMMARY

Five groundwater monitoring wells were sampled during this groundwater monitoring event and the data collected confirms that PCP concentrations in the deeper wells remain similar to concentrations observed in the past, with a slight but steady increase in concentration. The concentrations in the shallow wells showed a decrease in concentrations since the last sampling event. The data shows that the PCP impacts at concentrations exceeding the 2L Standard are centered around the MW-4 well-nest, at the former dip tank location. The PCP has migrated underneath the existing on-site building to the west but is delineated with the existing groundwater monitoring network.

A review of dissolved oxygen (DO) as percent and oxidation reduction potential (ORP) numbers between 2013 and 2013 show that the DO in the deeper wells range between 0.5 and 3.8 and 2.5 to 12.9 in the shallower wells. ORP ranged from 43 to -83 in the deeper wells and 43 to 225 in the shallow wells. PCP has been shown to degrade biologically in the presence of sufficient oxygen (aerobic biodegradation). Based on the measured DO and PCP concentration in the shallow monitoring wells, it appears aerobic biodegradation of PCP is occurring, however, there does not appear to be sufficient DO in the deeper aquifer for biodegradation to occur (as shown by stalled or no decrease in PCP concentrations in the deep wells since 2004).

ECS recommends evaluating additional treatment options of the deep aquifer groundwater, either biologically with the addition of oxygen enhancement or chemically using Fenton's reagent or similar. Following the treatment, groundwater monitoring wells MW-4s, MW-6s, MW-10s, MW-4d and MW-6d should be sampled. The next sampling event should be conducted in January 2017.

TABLES

Table 1
Historical Water Level Elevations
Former Ritter Millworks Site
Castle Hayne, New Hanover County, North Carolina

Well No.	Top of Casing Elevation	Well Depth	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation
			9/22/2004		11/30/2004		3/11/2005		6/14/2005		9/1/2005		12/20/2005		6/12/2006		12/28/2006	
Shallow Monitoring Wells																		
MW-1s	100.00	13.5	NM	NM	7.73	92.27	8.29	91.71	5.90	94.10	4.72	95.28	5.35	94.65	7.36	92.64	3.95	96.05
MW-2s	99.01	13.5	NM	NM	4.91	94.10	5.92	93.09	3.51	95.50	2.56	96.45	2.86	96.15	NM	NM	1.98	97.03
MW-3s	99.59	13.5	NM	NM	7.99	91.60	8.54	91.05	4.87	94.72	3.61	95.98	3.53	96.06	NM	NM	2.74	96.85
MW-4s	99.58	15	NM	NM	8.25	91.33	8.78	90.80	6.41	93.17	4.95	94.63	5.77	93.81	7.80	91.78	4.10	95.48
MW-6s	99.72	13	5.98	93.74	7.83	91.89	8.26	91.46	5.09	94.63	3.68	96.04	5.06	94.66	7.24	92.48	3.21	96.51
MW-7s	99.99	15	NM	NM	10.78	89.21	10.98	89.01	9.27	90.72	7.65	92.34	9.00	90.99	10.59	89.40	7.02	92.97
MW-9s	99.40	15	4.63	94.77	9.24	90.16	9.67	89.79	7.52	91.88	5.88	93.52	7.81	91.59	8.89	91.51	4.83	94.57
MW-10s	99.54	15	4.53	95.01	8.96	90.58	9.44	90.10	7.28	92.26	5.82	93.72	6.63	92.91	8.64	90.90	4.90	94.64
MW-11s	99.17	15	4.25	94.92	8.65	90.52	9.06	90.11	6.91	92.26	5.67	93.50	6.42	92.75	8.33	90.84	4.92	94.25
MW-12	NM	15	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-13	NM	15	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Intermediate Monitoring Wells																		
MW-1d	99.88	25	NM	NM	19.54	80.34	21.13	78.75	20.86	79.02	20.95	78.93	18.17	81.71	21.00	78.88	17.66	82.22
MW-2d	99.18	25	NM	NM	4.90	94.28	6.35	92.83	5.20	93.98	4.43	94.75	4.02	95.16	NM	NM	3.62	95.56
MW-3d	99.55	25	NM	NM	8.00	91.55	8.53	91.02	6.24	93.31	4.86	94.69	5.54	94.01	7.68	91.87	3.97	95.58
MW-4d	99.63	25	NM	NM	8.29	91.34	8.81	90.82	6.65	92.98	5.12	94.51	5.22	94.41	7.79	91.84	4.29	95.34
MW-6d	99.46	25	NM	NM	7.71	91.75	8.24	91.22	5.78	93.68	4.42	95.04	5.08	94.38	7.23	92.23	3.64	95.82
MW-7d	99.91	31	20.77	79.14	18.06	81.85	20.03	79.88	20.58	79.33	19.78	80.13	17.99	81.92	20.85	79.06	17.73	82.18
MW-9i	99.46	35	19.31	80.15	19.73	79.73	21.45	78.01	20.81	78.65	21.08	78.38	18.42	81.04	21.03	78.43	17.88	81.58
MW-10i	99.73	35	19.56	80.17	19.84	79.89	21.70	78.03	20.93	78.80	21.48	78.25	17.49	82.24	21.23	78.50	17.95	81.78
MW-11i	99.09	35	18.93	80.16	19.28	79.81	21.11	77.98	20.37	78.72	20.84	78.25	17.95	81.14	20.64	78.45	17.42	81.67
Deep Monitoring Wells																		
MW-5	99.47	50	NM	NM	19.57	79.90	21.46	78.01	20.74	78.73	21.28	78.19	18.26	81.21	NM	NM	17.72	81.75
MW-8	99.42	54	19.36	80.06	19.50	79.92	21.42	78.00	20.73	78.69	21.25	78.17	18.22	81.20	20.86	78.56	17.71	81.71

Notes:

BLS - Feet below land surface

**-Well could not be gauged due to obstruction above groundwater elevation

NM - Not Measured

NC - Not Calculated

Measurements in feet

Table 1
Historical Water Level Elevations
Former Ritter Millworks Site
Castle Hayne, New Hanover County, North Carolina

Well No.	Top of Casing Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation
		10/17/2007		4/16/2008		11/15/2010		11/14/2011		11/14/2012		11/19 & 20/2013		1/13/2015		1/6/2016	
Shallow Monitoring Wells																	
MW-1s	100.00	9.90	90.10	7.23	92.77	8.15	91.85	**	**	8.29	91.71	9.59	90.41	3.32	96.68	3.20	96.80
MW-2s	99.01	7.80	91.21	4.63	94.38	5.78	93.23	6.94	92.07	5.39	93.62	7.58	91.43	2.43	96.58	1.60	97.41
MW-3s	99.59	10.00	89.59	7.39	92.20	8.40	91.19	8.63	90.96	8.50	91.09	9.87	89.72	3.11	96.48	2.81	96.78
MW-4s	99.58	10.17	89.41	7.81	91.77	8.57	91.01	8.82	90.76	8.71	90.87	9.81	89.77	4.60	94.98	4.02	95.56
MW-6s	99.72	9.90	89.82	6.23	93.49	7.57	92.15	7.90	91.82	8.07	91.65	9.28	90.44	2.64	97.08	2.60	97.12
MW-7s	99.99	12.60	87.39	10.18	89.81	10.51	89.48	10.81	89.18	10.93	89.06	11.32	88.67	7.72	92.27	6.25	93.74
MW-9s	99.40	10.90	88.50	8.81	90.59	8.51	90.89	9.65	89.75	9.67	89.73	20.57	78.83	Destroyed	NM	Destroyed	NM
MW-10s	99.54	10.60	88.94	8.45	91.06	9.10	90.44	9.32	90.22	9.33	90.21	10.27	89.27	5.25	94.29	4.68	94.86
MW-11s	99.17	10.16	89.01	8.06	91.11	8.68	90.49	8.95	90.22	9.02	90.15	9.86	89.31	6.36	92.81	4.41	94.76
MW-12	NM	NI	NI	NI	NI	7.21	NM	7.52	NM	7.33	NM	8.49	NM	3.50	NM	3.10	NM
MW-13	NM	NI	NI	NI	NI	10.69	NM	10.95	NM	11.14	NM	11.55	NM	8.32	NM	6.89	NM
Intermediate Monitoring Wells																	
MW-1d	99.88	Dry	NC	22.75	77.13	20.05	79.83	21.29	78.59	21.06	78.82	20.80	79.08	17.85	82.03	15.79	84.09
MW-2d	99.18	6.10	93.08	7.06	92.12	6.04	93.14	7.46	91.72	6.75	92.43	7.04	92.14	4.89	94.29	3.91	95.27
MW-3d	99.55	10.00	89.55	7.59	91.96	8.38	91.17	8.61	90.94	8.38	91.17	9.15	90.40	4.74	94.81	4.11	95.44
MW-4d	99.63	6.45	93.18	7.85	91.78	8.81	90.82	8.88	90.75	8.53	91.10	9.20	90.43	6.81	92.82	4.08	95.55
MW-6d	99.46	9.75	89.71	7.13	92.33	8.02	91.44	8.29	91.17	8.19	91.27	9.38	90.08	5.75	93.71	4.53	94.93
MW-7d	99.91	27.65	72.26	24.92	74.99	19.55	80.36	20.56	79.35	23.16	76.75	22.15	77.76	18.57	81.34	17.12	82.79
MW-9i	99.46	25.32	74.14	22.66	76.80	20.11	79.35	21.61	77.85	21.22	78.24	20.79	78.67	18.08	81.38	16.10	83.36
MW-10i	99.73	25.36	74.37	22.90	76.83	20.22	79.51	21.91	77.82	21.25	78.48	20.83	78.90	18.16	81.57	16.20	83.53
MW-11i	99.09	24.80	74.29	22.32	76.77	19.70	79.39	21.39	77.70	19.76	79.33	20.34	78.75	17.72	81.37	15.76	83.33
Deep Monitoring Wells																	
MW-5	99.47	25.15	74.32	22.69	76.78	19.95	79.52	21.68	77.79	21.10	78.37	20.55	78.92	17.98	81.49	16.01	83.46
MW-8	99.42	26.15	73.27	22.63	76.79	19.98	79.44	21.66	77.76	21.00	78.42	20.54	78.88	18.10	81.32	18.08	81.34

Notes:

BLS - Feet below land surface

Measurements in feet

**-Well could not be gauged due to obstruction above groundwater elevation

Table 2
Summary of Vertical Hydrualic Gradient Calculations
Former Ritter Millworks Site
Castle Hayne, New Hanover County, North Carolina

Well Pairs	MW-1s	MW-1d	MW-6s	MW-8	MW-7s	MW-7d	MW-10s	MW-10i	MW-11s	MW-11i
Top of Casing Elevation (ft.)	100.0	99.88	99.72	99.42	99.99	99.91	99.54	99.73	99.17	99.09
Well Depth (ft.)	13.5	25	13	54	15	31	15	35	15	35
Mid-Screen Depth (ft.)	8.5	22.5	8.5	50.5	10	30.5	10	32.5	10	32.5
Mid-Screen Elevation (ft.)	91.5	77.38	91.22	48.92	89.99	69.41	89.54	67.23	89.17	66.59
SWLE (ft.) on 01/7/2016	96.8	84.09	97.12	81.34	93.74	82.79	94.86	83.53	94.76	83.33
Change in SWLE (ft)	-12.71		-15.78		-10.95		-11.33		-11.43	
Length of Hydraulic Interval (ft)	14.12		42.3		20.58		22.31		22.58	
Vertical Gradient (ft/ft)	-0.90		-0.37		-0.53		-0.51		-0.51	

Notes:

SWLE - Static Water Level Elevation
ft - feet
ft/ft - feet per foot
Elevations relative to site benchmark
-indicates groundwater is moving vertically downward

Table 3
Historic Pentachlorophenol Data
Former Ritter Millworks Site
Castle Hayne, New Hanover County, North Carolina

Well No.	6/28/02	9/30/02	12/17/02	3/12/03	7/31/03	9/3/03	12/19/03	3/3/04	6/27/04	7/23/04	8/30/04**	9/23/04	11/30/04	3/11/05	6/14/05	9/1/05	12/20/05
Shallow Monitoring Wells																	
MW-1s	**1.5**	**0.9**	**5.0**	**2.8**	NS	**1.5**	NS	**0.81**	NS	NS	NS	NS	NS	NS	NS	**2.51**	**2.24**
MW-2s	**0.4**	<0.1	<0.1	<0.1	NS	<0.1	NS	<0.1	NS	NS	NS	NS	NS	NS	NS	<0.1	NS
MW-3s	<0.1	<0.1	<0.1	<0.1	NS	<0.1	NS	0.15	NS	NS	NS	NS	NS	NS	NS	<0.1	NS
MW-4s	**2.5**	<0.1	<0.1	**55**	NS	<0.1	NS	<0.1	NS	<0.1	<0.1	NS	**13**	**6.35**	**5.67**	0.103	NS
MW-6s	0.3	<0.1	<0.1	**0.99**	NS	<0.1	NS	**1.9**	NS	**0.741**	<0.1	NS	**2.11**	**0.876**	**0.703**	0.142	NS
MW-7s	0.3	**1.6**	**0.9**	**5.8**	**1.8**	**1.9**	<0.1	<0.1	<0.1	NS	NS	<0.1	NS	NS	0.115	<0.1	NS
MW-9s	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	<0.1	NS	NS	0.195	<0.1	NS
MW-10s	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	<0.1	NS	NS	**0.709**	**1.14**	<0.1
MW-11s	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	**0.357**	NS	NS	0.262	**0.589**	**0.343**
MW-12	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-13	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Intermediate Monitoring Wells																	
MW-1d	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NS	NS	NS	NS	NS	NS	NS	<0.1	NS
MW-2d	<0.1	<0.1	<0.1	<0.1	NS	<0.1	NS	<0.1	NS	NS	NS	NS	NS	NS	NS	<0.1	NS
MW-3d	<0.1	<0.1	<0.1	<0.1	NS	<0.1	NS	<0.1	NS	NS	NS	NS	NS	NS	NS	<0.1	NS
MW-4d	**41**	**42**	**50**	0.18	NS	**83**	NS	**55**	NS	**71.2**	**110**	NS	**89.9**	**24.6**	**15.0**	**35.4**	**22.3**
MW-6d	**23**	**39**	**60**	**150**	NS	**92**	NS	**240**	NS	**73.2**	**1.2**	NS	**24.6**	**12.7**	**13.0**	**3.61**	**12.10**
MW-7d	<0.1	<0.1	<0.1	0.16	<0.1	<0.1	<0.1	<0.1	<0.1	NS	NS	<0.1	NS	NS	**0.832**	<0.1	NS
MW-9i	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	<0.1	NS	NS	**0.59**	<0.1	NS
MW-10i	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	<0.1	NS	NS	0.148	<0.1	NS
MW-11i	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	<0.1	NS	NS	0.244	<0.1	NS
Deep Monitoring Wells																	
MW-5	<0.1	<0.1	<0.1	<0.1	NS	<0.1	NS	<0.1	<0.1	NS	NS	NS	NS	NS	NS	<0.1	NS
MW-8	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	<0.1	NS	NS	<0.1	<0.1	NS

Notes:
All results are reported in micrograms per liter (ug/L)
Concentrations in **bold** exceed the North Carolina 2L Groundwater Quality Standard of 0.30 ug/l
NS - Well Not Sampled and/or analyzed for this parameter
* - Well obstruction above groundwater table prevented samplin
** - First sampling event post injection
NI - Well not installed
J - indicates and estimated value
2L Standard - North Carolina Groundwater Quality Standards (15A NCAC 2L)

Table 3
Historic Pentachlorophenol Data
Former Ritter Millworks Site
Castle Hayne, New Hanover County, North Carolina

Well No.	6/13/06	12/29/06	10/17/07	4/16/08	11/15/10	11/14/11	11/15/12	11/19&20/13	01/13&14/15	1/6 & 1/7/2016
Shallow Monitoring Wells										
MW-1s	0.236	**66.0**	0.242J	**0.73**	0.197J	NS*	0.0914	0.21	0.11	NS
MW-2s	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-3s	NS	NS	NS	NS	<0.044	<0.0554	<0.0514	NS	NS	NS
MW-4s	**8.87**	<0.055	**2.30**	**2.1**	**4.46**	**7.86**	**2.91**	**3.7**	0.079	ND
MW-6s	**3.340**	0.071J	**0.636J**	<0.064	NS	NS	NS	NS	NS	0.14
MW-7s	0.122	<0.055	NS	NS	0.078J	<0.0601	0.173	<0.030	0.045	ND
MW-9s	<0.1	<0.055	NS	NS	NS	NS	NS	NS	NS	NS
MW-10s	**0.434**	**2.0**	**1.12**	**0.92**	0.250J	**0.424J**	**0.622**	**1.5**	**0.94**	0.28
MW-11s	0.16	0.090J	<0.228	<0.064	<0.042	<0.0587	0.0620J	0.044	0.06	NS
MW-12	NI	NI	NI	NI	<0.045	<0.0606	<0.0521	<0.030	<0.029	NS
MW-13	NI	NI	NI	NI	NS	NS	NS	NS	NS	NS
Intermediate Monitoring Wells										
MW-1d	<0.1	<0.055	NS	<0.064	<0.043	<0.0581	<0.0574	NS	NS	NS
MW-2d	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-3d	0.162	<0.055	<0.228	<0.064	<0.044	<0.0592	<0.0372	NS	NS	NS
MW-4d	**15.7**	**39.0**	**20.2**	**23**	**13.1**	**24.0**	**13.2**	**15.1**	**16.1**	**17.1**
MW-6d	**14.7**	**11.0**	**18.6**	**11**	NS	NS	NS	NS	NS	**24.4**
MW-7d	0.264	<0.055	NS	NS	NS	<0.636	NS	NS	NS	NS
MW-9i	<0.1	<0.055	NS	NS	NS	NS	NS	NS	NS	NS
MW-10i	<0.1	0.27J	<0.228	<0.064	<0.040	0.0601	<0.0568	<0.030	<0.030	NS
MW-11i	<0.1	0.26J	<0.228	<0.064	NS	NS	NS	NS	NS	NS
Deep Monitoring Wells										
MW-5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-8	<0.1	<0.055	NS	NS	<0.042	<0.0600	<0.0566	<0.029	<0.029	NS

Notes:
All results are reported in micrograms per liter (ug/L)
Concentrations in **bold** exceed the North Carolina 2L Groundwater Quality Standard of 0.30 ug/l
NS - Well Not Sampled and/or analyzed for this parameter
* - Well obstruction above groundwater table prevented sampling
** - First sampling event post injection
NI - Well not installed
J - indicates and estimated value
2L Standard - North Carolina Groundwater Quality Standards (15A NCAC 2L)

Table 3
Historic Pentachlorophenol Data
Former Ritter Millworks Site
Castle Hayne, North Carolina

Well No.	6/28/02	9/30/02	12/17/02	3/12/03	7/31/03	9/3/03	3/3/04	7/23/04	8/30/04	11/30/04	3/11/05	6/14/05	9/1/05	12/20/05	6/13/06	12/29/06	10/17/07	4/16/08	11/15/10	11/14/11	11/15/12	11/19/13	1/13/15	1/7/16
MW-4s	**2.5**	0	0	**55**	0	0	0	0	0	**13**	**6.35**	**5.67**	0.103	0	**8.87**	0	**2.30**	**2.1**	**4.46**	**7.86**	**2.91**	**3.7**	**0.079**	**<0.028**
MW-4D	**41**	**42**	**50**	0.18	0	**83**	**55**	**71.2**	**110**	**89.9**	**24.6**	**15.0**	**35.4**	**22.3**	**15.7**	**39.0**	**20.2**	**23**	**13.1**	**24.0**	**13.2**	**15.1**	**16.1**	**17.1**

Notes:

All results are reported in micrograms per liter (ug/L)

Concentrations in **bold** exceed the North Carolina 2L Groundwater Quality Standard c

NS - Well Not Sampled and/or analyzed for this parameter

* - Well obstruction above groundwater table prevented samplir

NI - Well not insulated

J - indicates and estimated value

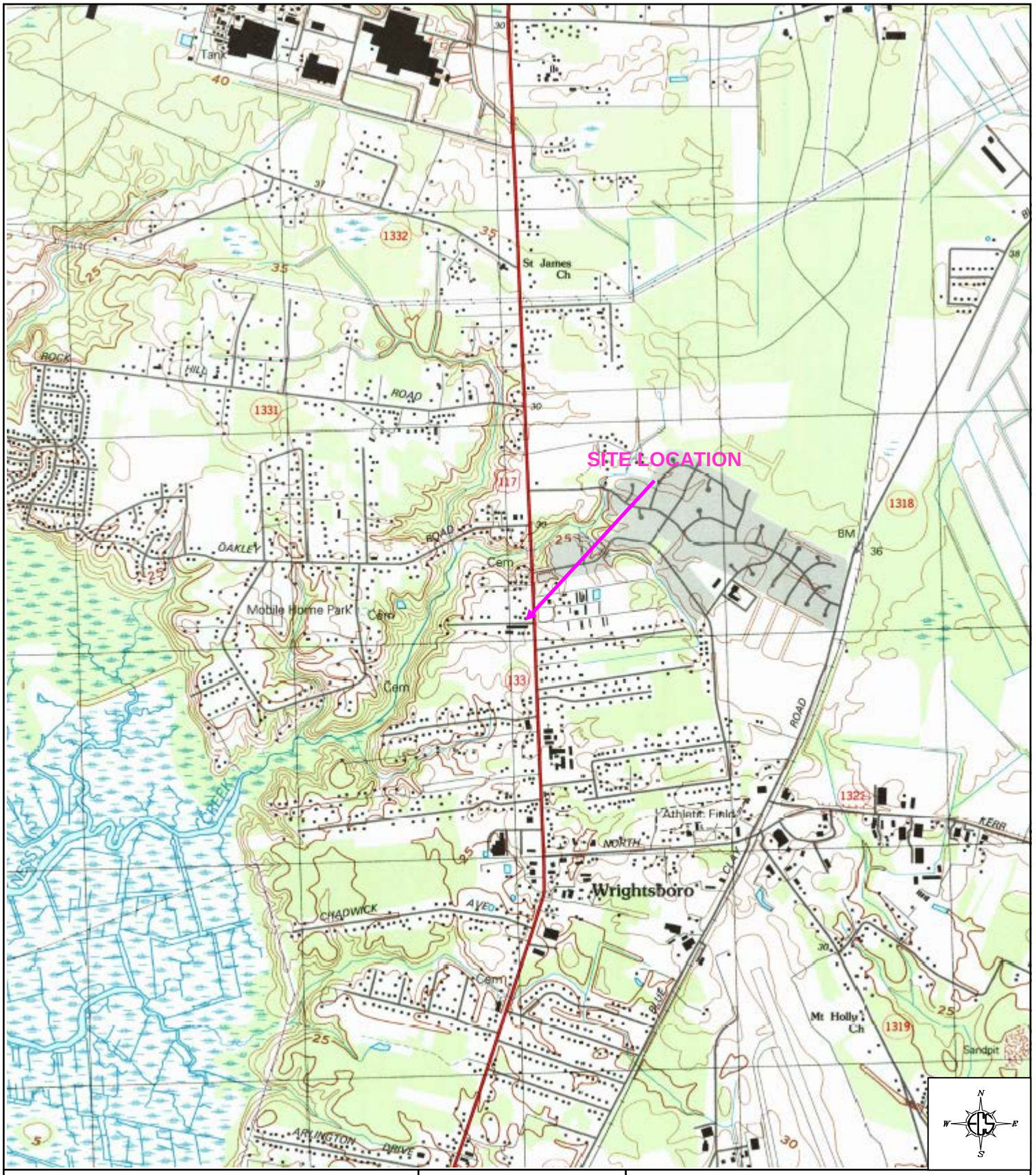
2L Standard - North Carolina Groundwater Quality Standards (15A NCAC 2L)

Table 4
Groundwater Analytical Pentachlorophenol Data
Former Ritter Millworks Site
Castle Hayne, New Hanover County, North Carolina
January 2015

Sample ID	Sample Date	Chlorinated Herbicides 8151 ug/L Pentachlorophenol
2L Standard		**0.3**
MW-4s	01/7/16	<0.028
MW-4d	01/7/16	**17.1**
MW-6s	01/7/16	0.14
MW-6d	01/7/16	**24.4**
MW-7s	01/7/16	<0.028
MW-7s (Duplicate)	01/7/16	0.035
MW-10s	01/7/16	0.28
Drum-1	01/7/16	**4.4**

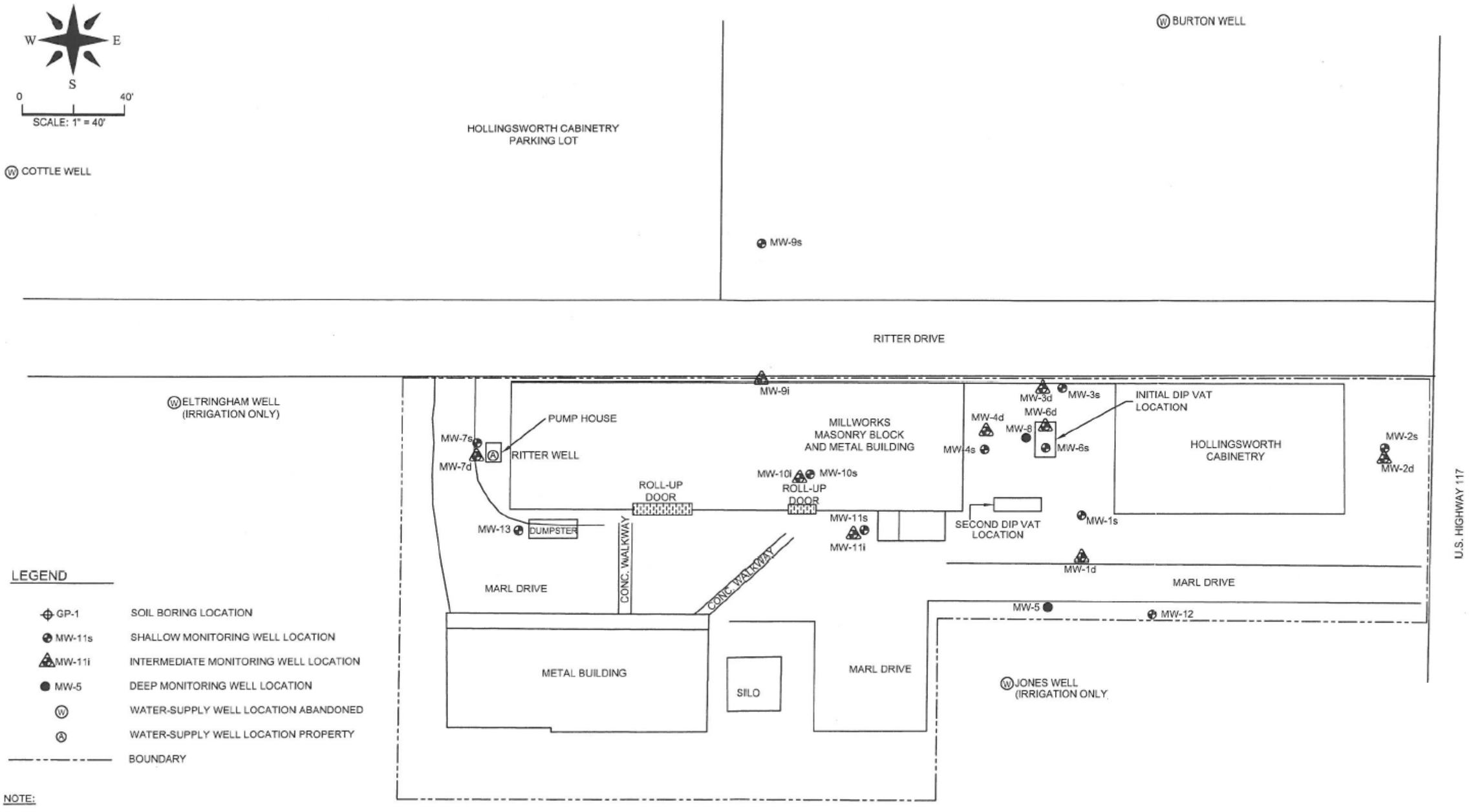
Notes:
All results are reported in micrograms per liter (ug/L)
* - Indicates duplicate sample
Concentrations in **bold e**xceed the North Carolina 2L Groundwater Quality standard
2L Standard - North Carolina Groundwater Quality Standards (15A NCAC 2L)

FIGURES



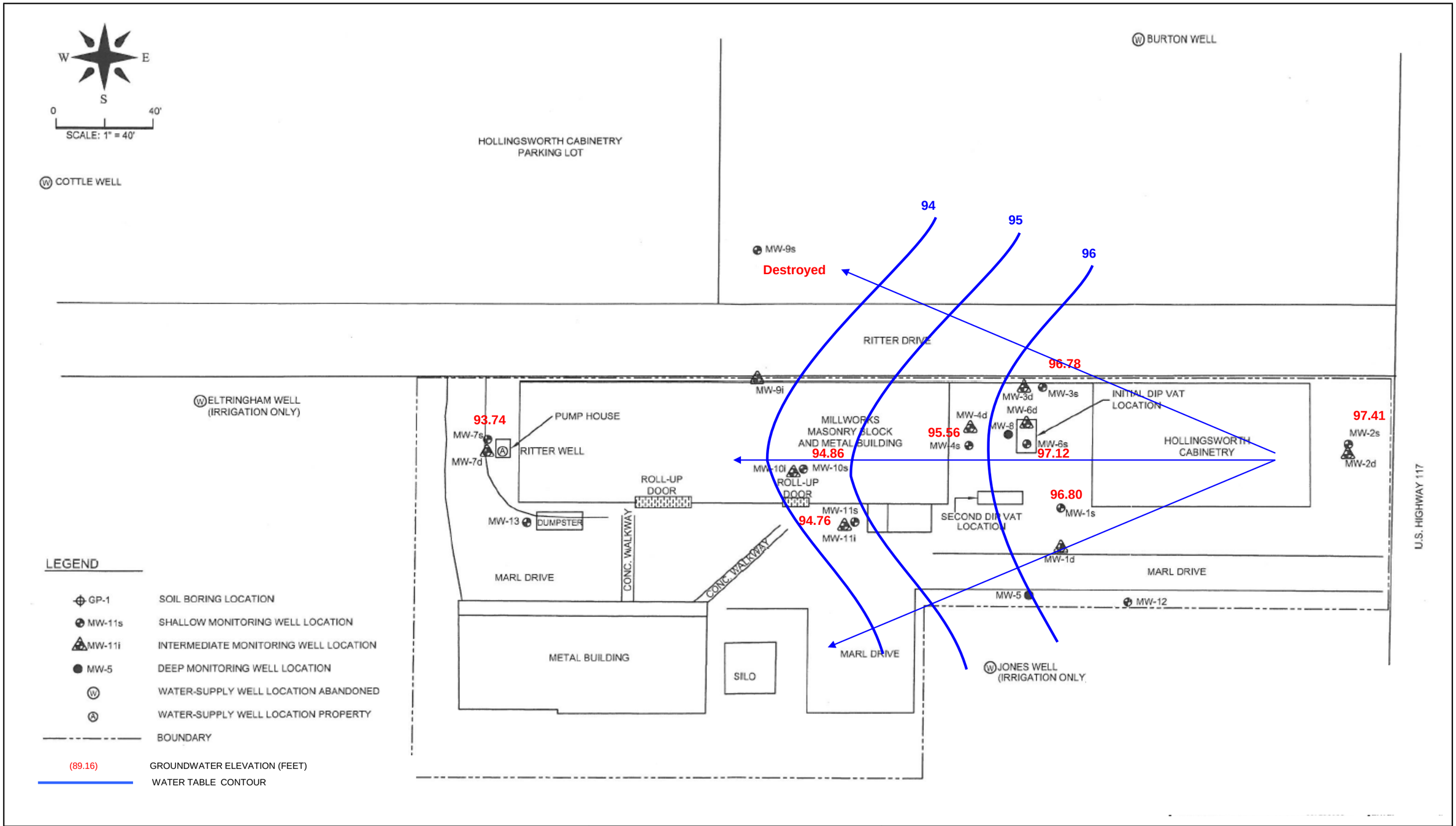
SOURCE:
United States Geological Survey
7.5 - Minute Series Topographic Map:
Castle Hayne, North Carolina Quadrangle
Dated 1997
Contour Interval = 10 feet
Scale: 1" ≈ 2,000'

FIGURE 1 - VICINITY MAP
Former Ritter Millwork Site
2913 Castle Hayne Road
Castle Hayne, North
Carolina ECS Project No.
49-1213



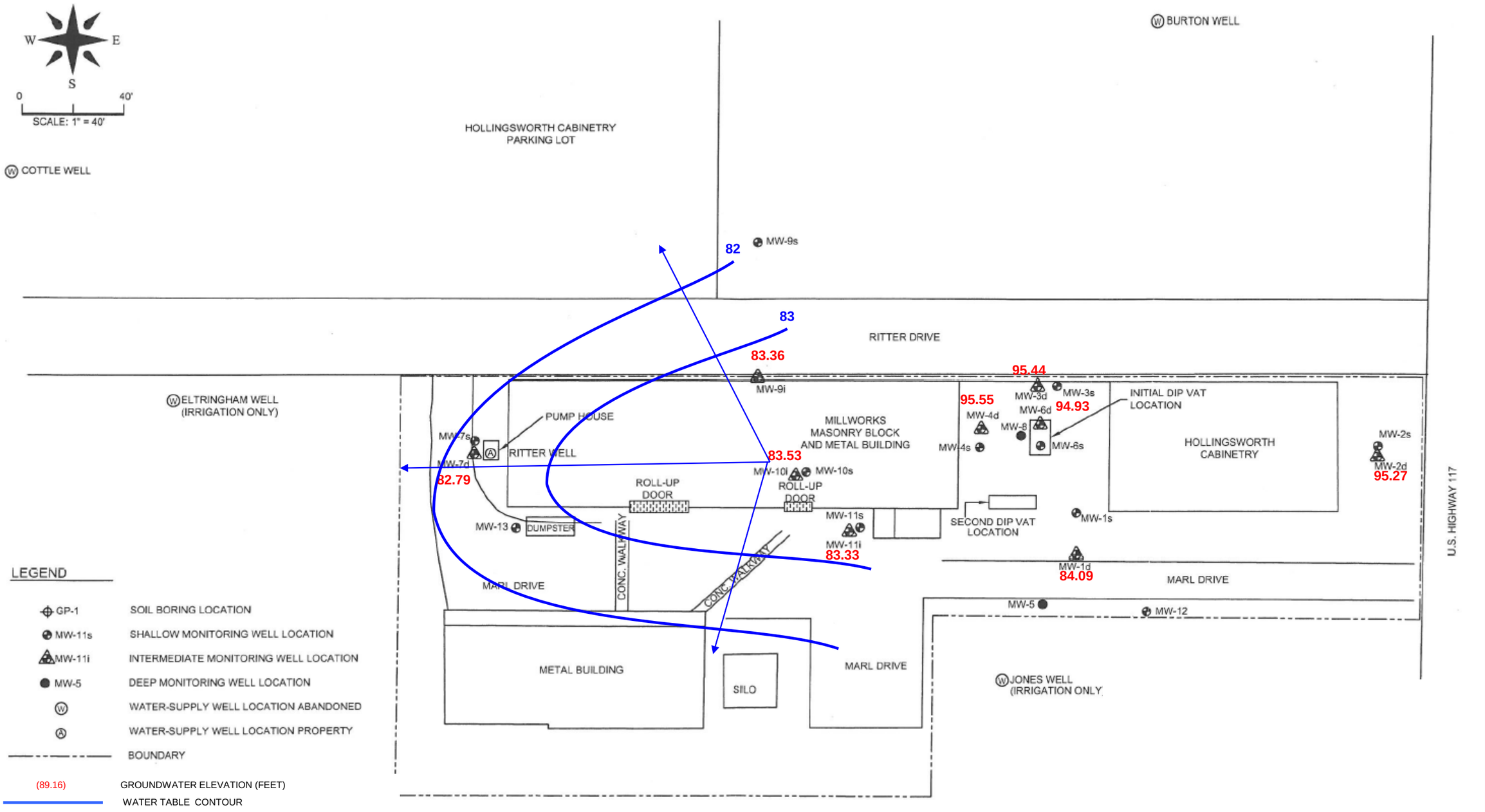
SOURCE:
AMEC Site Map (dated February 2012)

FIGURE 2 – SITE MAP
Former Ritter Millwork Site
2913 Castle Hayne Road
Castle Hayne, New Hanover County, North Carolina
ECS Project No. 49-1213



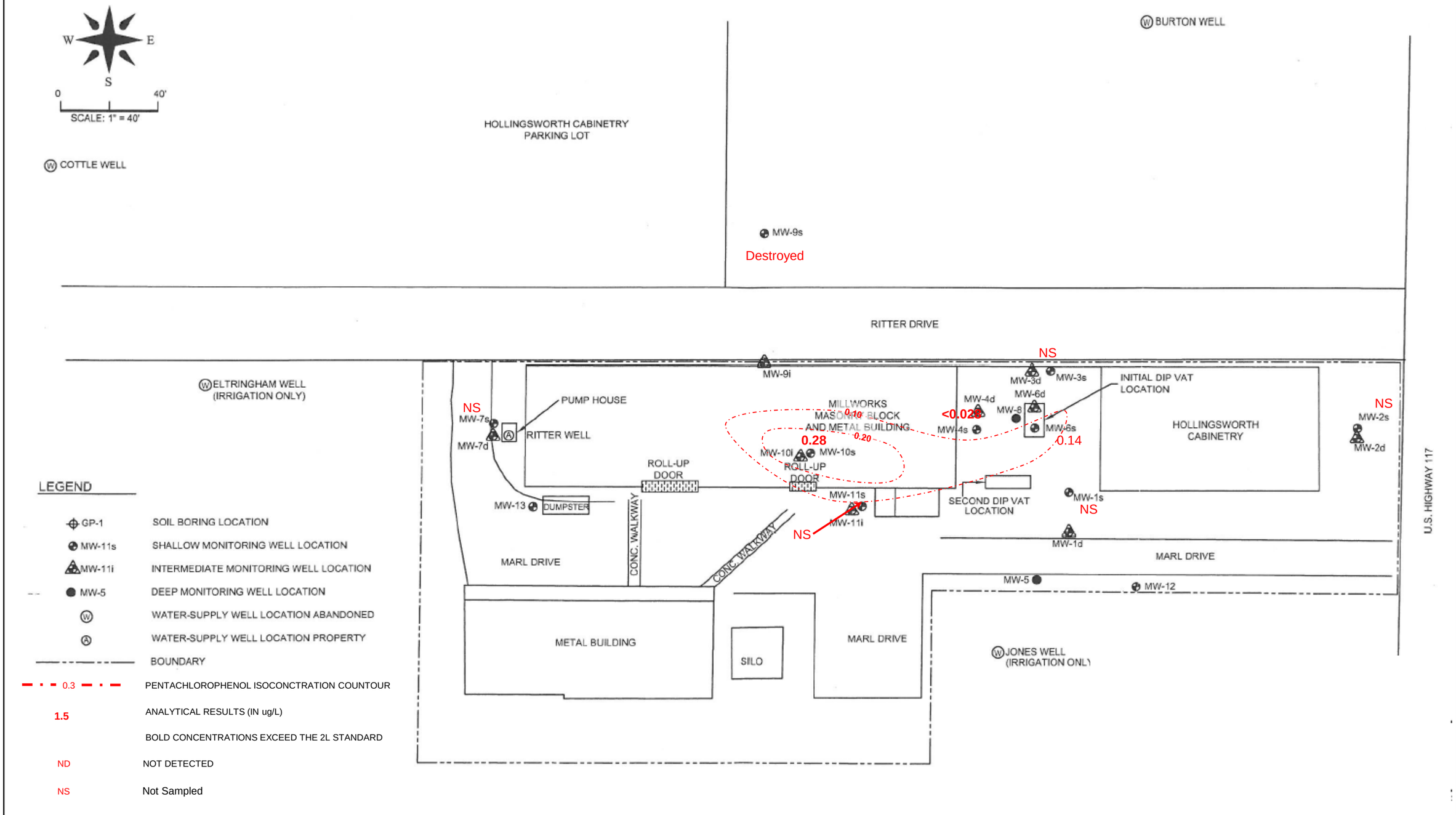
SOURCE:
AMEC Site Map (dated February 2012)
ECS Field Readings (1/13/2015)

FIGURE 3 – POTENTIOMETRIC MAP – SHALLOW AQUIFER ZONE (1/7/15)
Former Ritter Millwork Site
2913 Castle Hayne Road
Castle Hayne, New Hanover County, North Carolina
ECS Project No. 49-1213



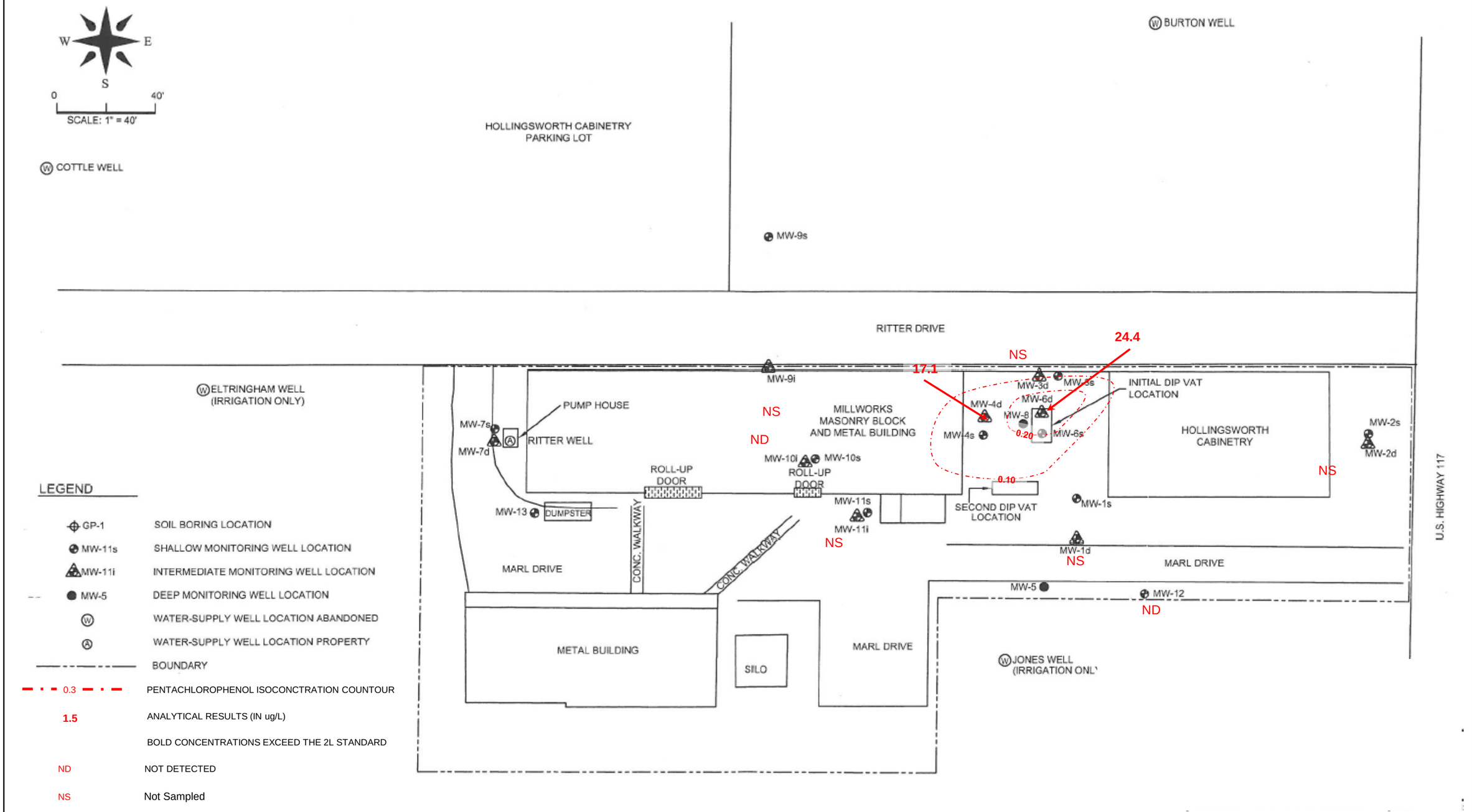
SOURCE:
AMEC Site Map (dated February 2012)
ECS Field Readings (1/13/2015)

FIGURE 4 – POTENTIOMETRIC MAP – INTERMEDIATE AQUIFER ZONE (1/7/16)
Former Ritter Millwork Site
2913 Castle Hayne Road
Castle Hayne, New Hanover County, North Carolina
ECS Project No. 49-1213



SOURCE:
AMEC Site Map (dated February 2012)

FIGURE 5 – PENTACHLOROPHENOL ISOCONCNETRATION MAP – SHALLOW AQUIFER ZONE (1/7/16)
Former Ritter Millwork Site
2913 Castle Hayne Road
Castle Hayne, New Hanover county, North Carolina
ECS Project No. 49-1213



SOURCE:
AMEC Site Map (dated February 2012)

FIGURE 6 – PENTACHLOROPHENOL ISOCONCNETRATION MAP
INTERMEDIATE AQUIFER ZONE (1/7/2015)
Former Ritter Millwork Site
2913 Castle Hayne Road
Castle Hayne, New Hanover County, North Carolina
ECS Project No. 49-1213

APPENDIX A

LABORATORY ANALYTICAL REPORTS AND CHAIN OF CUSTODY RECRODS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

January 15, 2016

Brooks Wall
ECS

,

RE: Project: RITTER MILL WORKS
Pace Project No.: 92282418

Dear Brooks Wall:
Enclosed are the analytical results for sample(s) received by the laboratory on January 08, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Taylor Ezell
taylor.ezell@pacelabs.com
Project Manager

Enclosures

cc: Ms. Amy Conchas, ECS
Brian Smith, ECS Carolinas LLP

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: RITTER MILL WORKS
Pace Project No.: 92282418

Ormond Beach Certification IDs
8 East Tower Circle, Ormond Beach, FL 32174
Alabama Certification #: 41320
Connecticut Certification #: PH-0216
Delaware Certification: FL NELAC Reciprocity
Florida Certification #: E83079
Georgia Certification #: 955
Guam Certification: FL NELAC Reciprocity
Hawaii Certification: FL NELAC Reciprocity
Illinois Certification #: 200068
Indiana Certification: FL NELAC Reciprocity
Kansas Certification #: E-10383
Kentucky Certification #: 90050
Louisiana Certification #: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007
Maryland Certification: #346
Michigan Certification #: 9911
Mississippi Certification: FL NELAC Reciprocity
Missouri Certification #: 236
Montana Certification #: Cert 0074
Nebraska Certification: NE-OS-28-14
Nevada Certification: FL NELAC Reciprocity
New Hampshire Certification #: 2958
New York Certification #: 11608
North Carolina Environmental Certificate #: 667
North Carolina Certification #: 12710
North Dakota Certification #: R-216
Oklahoma Certification #: D9947
Pennsylvania Certification #: 68-00547
Puerto Rico Certification #: FL01264
South Carolina Certification: #96042001
Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity
US Virgin Islands Certification: FL NELAC Reciprocity
Virginia Environmental Certification #: 460165
West Virginia Certification #: 9962C
Wisconsin Certification #: 399079670
Wyoming (EPA Region 8): FL NELAC Reciprocity

Charlotte Certification IDs
9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: RITTER MILL WORKS
Pace Project No.: 92282418

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92282418001	**MW-4S**	EPA 8151	LJM	2	PASI-O
92282418002	**MW-4d**	EPA 8151	LJM	2	PASI-O
92282418003	**MW-6S**	EPA 8151	LJM	2	PASI-O
92282418004	**MW-6D**	EPA 8151	LJM	2	PASI-O
92282418005	**MW-7S**	EPA 8151	LJM	2	PASI-O
92282418006	**MW-10S**	EPA 8151	LJM	2	PASI-O
92282418007	**DRUM-1**	EPA 8151	LJM	2	PASI-O
		EPA 8260	NB	63	PASI-C
92282418008	**DUPLICATE**	EPA 8151	LJM	2	PASI-O

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: RITTER MILL WORKS
Pace Project No.: 92282418

Sample: MW-4S **Lab ID: 92282418001** Collected: 01/07/16 12:00 Received: 01/08/16 15:34 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8151 Chlorinated Herbicides	Analytical Method: EPA 8151 Preparation Method: EPA 8151							
Pentachlorophenol	ND	ug/L	0.028	1	01/13/16 15:00	01/14/16 07:58	87-86-5	
Surrogates								
2,4-DCAA (S)	59	%	36-130	1	01/13/16 15:00	01/14/16 07:58	19719-28-9	

Sample: MW-4d **Lab ID: 92282418002** Collected: 01/07/16 11:00 Received: 01/08/16 15:34 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8151 Chlorinated Herbicides	Analytical Method: EPA 8151 Preparation Method: EPA 8151							
Pentachlorophenol	**17.1**	ug/L	2.8	100	01/13/16 15:00	01/15/16 02:32	87-86-5	
Surrogates								
2,4-DCAA (S)	1850	%	36-130	1	01/13/16 15:00	01/14/16 08:29	19719-28-9	S5

Sample: MW-6S **Lab ID: 92282418003** Collected: 01/07/16 14:30 Received: 01/08/16 15:34 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8151 Chlorinated Herbicides	Analytical Method: EPA 8151 Preparation Method: EPA 8151							
Pentachlorophenol	**0.14**	ug/L	0.028	1	01/13/16 15:00	01/14/16 08:59	87-86-5	
Surrogates								
2,4-DCAA (S)	84	%	36-130	1	01/13/16 15:00	01/14/16 08:59	19719-28-9	

Sample: MW-6D **Lab ID: 92282418004** Collected: 01/07/16 12:30 Received: 01/08/16 15:34 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8151 Chlorinated Herbicides	Analytical Method: EPA 8151 Preparation Method: EPA 8151							
Pentachlorophenol	**24.4**	ug/L	2.8	100	01/13/16 15:00	01/15/16 03:02	87-86-5	
Surrogates								
2,4-DCAA (S)	2780	%	36-130	1	01/13/16 15:00	01/14/16 10:00	19719-28-9	S5

Sample: MW-7S **Lab ID: 92282418005** Collected: 01/07/16 09:30 Received: 01/08/16 15:34 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8151 Chlorinated Herbicides	Analytical Method: EPA 8151 Preparation Method: EPA 8151							
Pentachlorophenol	ND	ug/L	0.028	1	01/13/16 15:00	01/14/16 10:30	87-86-5	
Surrogates								
2,4-DCAA (S)	52	%	36-130	1	01/13/16 15:00	01/14/16 10:30	19719-28-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: RITTER MILL WORKS
Pace Project No.: 92282418

Sample: MW-10S **Lab ID: 92282418006** Collected: 01/07/16 16:00 Received: 01/08/16 15:34 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8151 Chlorinated Herbicides	Analytical Method: EPA 8151 Preparation Method: EPA 8151							
Pentachlorophenol	**0.28**	ug/L	0.028	1	01/13/16 15:00	01/14/16 11:00	87-86-5	
Surrogates								
2,4-DCAA (S)	85	%	36-130	1	01/13/16 15:00	01/14/16 11:00	19719-28-9	

Sample: DRUM-1 **Lab ID: 92282418007** Collected: 01/07/16 17:00 Received: 01/08/16 15:34 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8151 Chlorinated Herbicides	Analytical Method: EPA 8151 Preparation Method: EPA 8151							
Pentachlorophenol	**4.4**	ug/L	0.71	25	01/13/16 15:00	01/15/16 03:32	87-86-5	
Surrogates								
2,4-DCAA (S)	571	%	36-130	1	01/13/16 15:00	01/14/16 11:30	19719-28-9	S5
8260 MSV Low Level	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/13/16 02:15	67-64-1	
Benzene	ND	ug/L	1.0	1		01/13/16 02:15	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		01/13/16 02:15	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		01/13/16 02:15	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/13/16 02:15	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/13/16 02:15	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/13/16 02:15	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/13/16 02:15	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		01/13/16 02:15	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/13/16 02:15	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/13/16 02:15	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/13/16 02:15	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/13/16 02:15	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		01/13/16 02:15	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		01/13/16 02:15	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		01/13/16 02:15	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		01/13/16 02:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		01/13/16 02:15	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		01/13/16 02:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/13/16 02:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		01/13/16 02:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/13/16 02:15	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		01/13/16 02:15	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/13/16 02:15	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/13/16 02:15	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/13/16 02:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/13/16 02:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/13/16 02:15	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/13/16 02:15	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		01/13/16 02:15	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		01/13/16 02:15	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		01/13/16 02:15	563-58-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: RITTER MILL WORKS
Pace Project No.: 92282418

Sample: DRUM-1 **Lab ID: 92282418007** Collected: 01/07/16 17:00 Received: 01/08/16 15:34 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/13/16 02:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/13/16 02:15	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		01/13/16 02:15	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		01/13/16 02:15	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		01/13/16 02:15	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		01/13/16 02:15	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		01/13/16 02:15	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		01/13/16 02:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/13/16 02:15	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		01/13/16 02:15	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		01/13/16 02:15	91-20-3	
Styrene	ND	ug/L	1.0	1		01/13/16 02:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/13/16 02:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/13/16 02:15	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/13/16 02:15	127-18-4	
Toluene	ND	ug/L	1.0	1		01/13/16 02:15	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		01/13/16 02:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		01/13/16 02:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/13/16 02:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/13/16 02:15	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/13/16 02:15	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/13/16 02:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/13/16 02:15	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/13/16 02:15	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/13/16 02:15	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/13/16 02:15	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		01/13/16 02:15	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		01/13/16 02:15	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		01/13/16 02:15	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		01/13/16 02:15	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		01/13/16 02:15	2037-26-5	

Sample: DUPLICATE **Lab ID: 92282418008** Collected: 01/07/16 00:00 Received: 01/08/16 15:34 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8151 Chlorinated Herbicides	Analytical Method: EPA 8151 Preparation Method: EPA 8151							
Pentachlorophenol	**0.035**	ug/L	0.028	1	01/13/16 15:00	01/14/16 12:01	87-86-5	
Surrogates								
2,4-DCAA (S)	82	%	36-130	1	01/13/16 15:00	01/14/16 12:01	19719-28-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: RITTER MILL WORKS
Pace Project No.: 92282418

QC Batch: MSV/35148
QC Batch Method: EPA 8260
Analysis Method: EPA 8260
Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92282418007

METHOD BLANK: 1645591
Matrix: Water
Associated Lab Samples: 92282418007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/12/16 23:58	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/12/16 23:58	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/12/16 23:58	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/12/16 23:58	
1,1-Dichloroethane	ug/L	ND	1.0	01/12/16 23:58	
1,1-Dichloroethene	ug/L	ND	1.0	01/12/16 23:58	
1,1-Dichloropropene	ug/L	ND	1.0	01/12/16 23:58	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	01/12/16 23:58	
1,2,3-Trichloropropane	ug/L	ND	1.0	01/12/16 23:58	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	01/12/16 23:58	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	01/12/16 23:58	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	01/12/16 23:58	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/12/16 23:58	
1,2-Dichloroethane	ug/L	ND	1.0	01/12/16 23:58	
1,2-Dichloropropane	ug/L	ND	1.0	01/12/16 23:58	
1,3-Dichlorobenzene	ug/L	ND	1.0	01/12/16 23:58	
1,3-Dichloropropane	ug/L	ND	1.0	01/12/16 23:58	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/12/16 23:58	
2,2-Dichloropropane	ug/L	ND	1.0	01/12/16 23:58	
2-Butanone (MEK)	ug/L	ND	5.0	01/12/16 23:58	
2-Chlorotoluene	ug/L	ND	1.0	01/12/16 23:58	
2-Hexanone	ug/L	ND	5.0	01/12/16 23:58	
4-Chlorotoluene	ug/L	ND	1.0	01/12/16 23:58	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/12/16 23:58	
Acetone	ug/L	ND	25.0	01/12/16 23:58	
Benzene	ug/L	ND	1.0	01/12/16 23:58	
Bromobenzene	ug/L	ND	1.0	01/12/16 23:58	
Bromochloromethane	ug/L	ND	1.0	01/12/16 23:58	
Bromodichloromethane	ug/L	ND	1.0	01/12/16 23:58	
Bromoform	ug/L	ND	1.0	01/12/16 23:58	
Bromomethane	ug/L	ND	2.0	01/12/16 23:58	
Carbon tetrachloride	ug/L	ND	1.0	01/12/16 23:58	
Chlorobenzene	ug/L	ND	1.0	01/12/16 23:58	
Chloroethane	ug/L	ND	1.0	01/12/16 23:58	
Chloroform	ug/L	ND	1.0	01/12/16 23:58	
Chloromethane	ug/L	ND	1.0	01/12/16 23:58	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/12/16 23:58	
cis-1,3-Dichloropropene	ug/L	ND	1.0	01/12/16 23:58	
Dibromochloromethane	ug/L	ND	1.0	01/12/16 23:58	
Dibromomethane	ug/L	ND	1.0	01/12/16 23:58	
Dichlorodifluoromethane	ug/L	ND	1.0	01/12/16 23:58	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: RITTER MILL WORKS
Pace Project No.: 92282418

METHOD BLANK: 1645591 Matrix: Water
Associated Lab Samples: 92282418007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	1.0	01/12/16 23:58	
Ethylbenzene	ug/L	ND	1.0	01/12/16 23:58	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	01/12/16 23:58	
m&p-Xylene	ug/L	ND	2.0	01/12/16 23:58	
Methyl-tert-butyl ether	ug/L	ND	1.0	01/12/16 23:58	
Methylene Chloride	ug/L	ND	2.0	01/12/16 23:58	
Naphthalene	ug/L	ND	1.0	01/12/16 23:58	
o-Xylene	ug/L	ND	1.0	01/12/16 23:58	
p-Isopropyltoluene	ug/L	ND	1.0	01/12/16 23:58	
Styrene	ug/L	ND	1.0	01/12/16 23:58	
Tetrachloroethene	ug/L	ND	1.0	01/12/16 23:58	
Toluene	ug/L	ND	1.0	01/12/16 23:58	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/12/16 23:58	
trans-1,3-Dichloropropene	ug/L	ND	1.0	01/12/16 23:58	
Trichloroethene	ug/L	ND	1.0	01/12/16 23:58	
Trichlorofluoromethane	ug/L	ND	1.0	01/12/16 23:58	
Vinyl acetate	ug/L	ND	2.0	01/12/16 23:58	
Vinyl chloride	ug/L	ND	1.0	01/12/16 23:58	
Xylene (Total)	ug/L	ND	2.0	01/12/16 23:58	
1,2-Dichloroethane-d4 (S)	%	100	70-130	01/12/16 23:58	
4-Bromofluorobenzene (S)	%	104	70-130	01/12/16 23:58	
Toluene-d8 (S)	%	101	70-130	01/12/16 23:58	

LABORATORY CONTROL SAMPLE: 1645592

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	45.7	91	70-130	
1,1,1-Trichloroethane	ug/L	50	48.1	96	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	45.2	90	70-130	
1,1,2-Trichloroethane	ug/L	50	44.5	89	70-130	
1,1-Dichloroethane	ug/L	50	45.4	91	70-130	
1,1-Dichloroethene	ug/L	50	48.2	96	70-132	
1,1-Dichloropropene	ug/L	50	47.3	95	70-130	
1,2,3-Trichlorobenzene	ug/L	50	49.9	100	70-135	
1,2,3-Trichloropropane	ug/L	50	47.1	94	70-130	
1,2,4-Trichlorobenzene	ug/L	50	49.5	99	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	44.1	88	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	46.8	94	70-130	
1,2-Dichlorobenzene	ug/L	50	44.8	90	70-130	
1,2-Dichloroethane	ug/L	50	43.4	87	70-130	
1,2-Dichloropropane	ug/L	50	45.9	92	70-130	
1,3-Dichlorobenzene	ug/L	50	46.1	92	70-130	
1,3-Dichloropropane	ug/L	50	45.2	90	70-130	
1,4-Dichlorobenzene	ug/L	50	45.6	91	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: RITTER MILL WORKS
Pace Project No.: 92282418

LABORATORY CONTROL SAMPLE: 1645592

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,2-Dichloropropane	ug/L	50	46.3	93	58-145	
2-Butanone (MEK)	ug/L	100	93.0	93	70-145	
2-Chlorotoluene	ug/L	50	44.7	89	70-130	
2-Hexanone	ug/L	100	84.4	84	70-144	
4-Chlorotoluene	ug/L	50	45.4	91	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	92.3	92	70-140	
Acetone	ug/L	100	96.4	96	50-175	
Benzene	ug/L	50	45.0	90	70-130	
Bromobenzene	ug/L	50	47.3	95	70-130	
Bromochloromethane	ug/L	50	54.3	109	70-130	
Bromodichloromethane	ug/L	50	47.2	94	70-130	
Bromoform	ug/L	50	41.1	82	70-130	
Bromomethane	ug/L	50	48.0	96	54-130	
Carbon tetrachloride	ug/L	50	48.0	96	70-132	
Chlorobenzene	ug/L	50	44.7	89	70-130	
Chloroethane	ug/L	50	50.7	101	64-134	
Chloroform	ug/L	50	46.1	92	70-130	
Chloromethane	ug/L	50	52.1	104	64-130	
cis-1,2-Dichloroethene	ug/L	50	46.3	93	70-131	
cis-1,3-Dichloropropene	ug/L	50	48.5	97	70-130	
Dibromochloromethane	ug/L	50	45.0	90	70-130	
Dibromomethane	ug/L	50	48.4	97	70-131	
Dichlorodifluoromethane	ug/L	50	51.8	104	56-130	
Diisopropyl ether	ug/L	50	46.8	94	70-130	
Ethylbenzene	ug/L	50	44.6	89	70-130	
Hexachloro-1,3-butadiene	ug/L	50	56.7	113	70-130	
m&p-Xylene	ug/L	100	90.2	90	70-130	
Methyl-tert-butyl ether	ug/L	50	46.6	93	70-130	
Methylene Chloride	ug/L	50	51.3	103	63-130	
Naphthalene	ug/L	50	48.5	97	70-138	
o-Xylene	ug/L	50	45.7	91	70-130	
p-Isopropyltoluene	ug/L	50	47.1	94	70-130	
Styrene	ug/L	50	45.5	91	70-130	
Tetrachloroethene	ug/L	50	45.3	91	70-130	
Toluene	ug/L	50	45.1	90	70-130	
trans-1,2-Dichloroethene	ug/L	50	45.5	91	70-130	
trans-1,3-Dichloropropene	ug/L	50	46.6	93	70-132	
Trichloroethene	ug/L	50	43.7	87	70-130	
Trichlorofluoromethane	ug/L	50	49.2	98	62-133	
Vinyl acetate	ug/L	100	98.1	98	66-157	
Vinyl chloride	ug/L	50	52.3	105	50-150	
Xylene (Total)	ug/L	150	136	91	70-130	
1,2-Dichloroethane-d4 (S)	%			100	70-130	
4-Bromofluorobenzene (S)	%			107	70-130	
Toluene-d8 (S)	%			99	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: RITTER MILL WORKS
Pace Project No.: 92282418

QC Batch: OEXT/26104 Analysis Method: EPA 8151
QC Batch Method: EPA 8151 Analysis Description: 8151A GCS Herbicides
Associated Lab Samples: 92282418001, 92282418002, 92282418003, 92282418004, 92282418005, 92282418006, 92282418007, 92282418008

METHOD BLANK: 1445204 Matrix: Water
Associated Lab Samples: 92282418001, 92282418002, 92282418003, 92282418004, 92282418005, 92282418006, 92282418007, 92282418008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Pentachlorophenol	ug/L	ND	0.028	01/14/16 06:28	
2,4-DCAA (S)	%	88	36-130	01/14/16 06:28	

LABORATORY CONTROL SAMPLE & LCSD: 1445205 1446719

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Pentachlorophenol	ug/L	.18	0.23	0.22	128	123	62-154	4	40	
2,4-DCAA (S)	%				82	81	36-130		40	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: RITTER MILL WORKS
Pace Project No.: 92282418

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-C	Pace Analytical Services - Charlotte
PASI-O	Pace Analytical Services - Ormond Beach

ANALYTE QUALIFIERS

S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: RITTER MILL WORKS
Pace Project No.: 92282418

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92282418001	**MW-4S**	EPA 8151	OEXT/26104	EPA 8151	GCSV/16969
92282418002	**MW-4d**	EPA 8151	OEXT/26104	EPA 8151	GCSV/16969
92282418003	**MW-6S**	EPA 8151	OEXT/26104	EPA 8151	GCSV/16969
92282418004	**MW-6D**	EPA 8151	OEXT/26104	EPA 8151	GCSV/16969
92282418005	**MW-7S**	EPA 8151	OEXT/26104	EPA 8151	GCSV/16969
92282418006	**MW-10S**	EPA 8151	OEXT/26104	EPA 8151	GCSV/16969
92282418007	**DRUM-1**	EPA 8151	OEXT/26104	EPA 8151	GCSV/16969
92282418008	**DUPLICATE**	EPA 8151	OEXT/26104	EPA 8151	GCSV/16969
92282418007	**DRUM-1**	EPA 8260	MSV/35148		

Sample Condition Upon Receipt

Client Name: ECS

Project #: WO# : 92282418

92282418

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other:

Custody Seal on Cooler/Box Present? ☐ Yes ☐ No **Seals Intact?** ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:

Thermometer Used: ☑ T1505 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Cooler Temp Corrected (°C): 9.4 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** 0.0 °C **Date and Initials of Person Examining Contents:** AP 1-11-16

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

If Yes to either question, fill out a Regulated Soil Checklist and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☐ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☐ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☑ No	☐ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	12.
-Includes Date/Time/ID/Analysis Matrix: wt				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☐ No	☑ N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☑ Yes	☐ No	☐ N/A	
Samples checked for dechlorization	☑ Yes	☐ No	☐ N/A	14.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☐ N/A	15.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	16.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

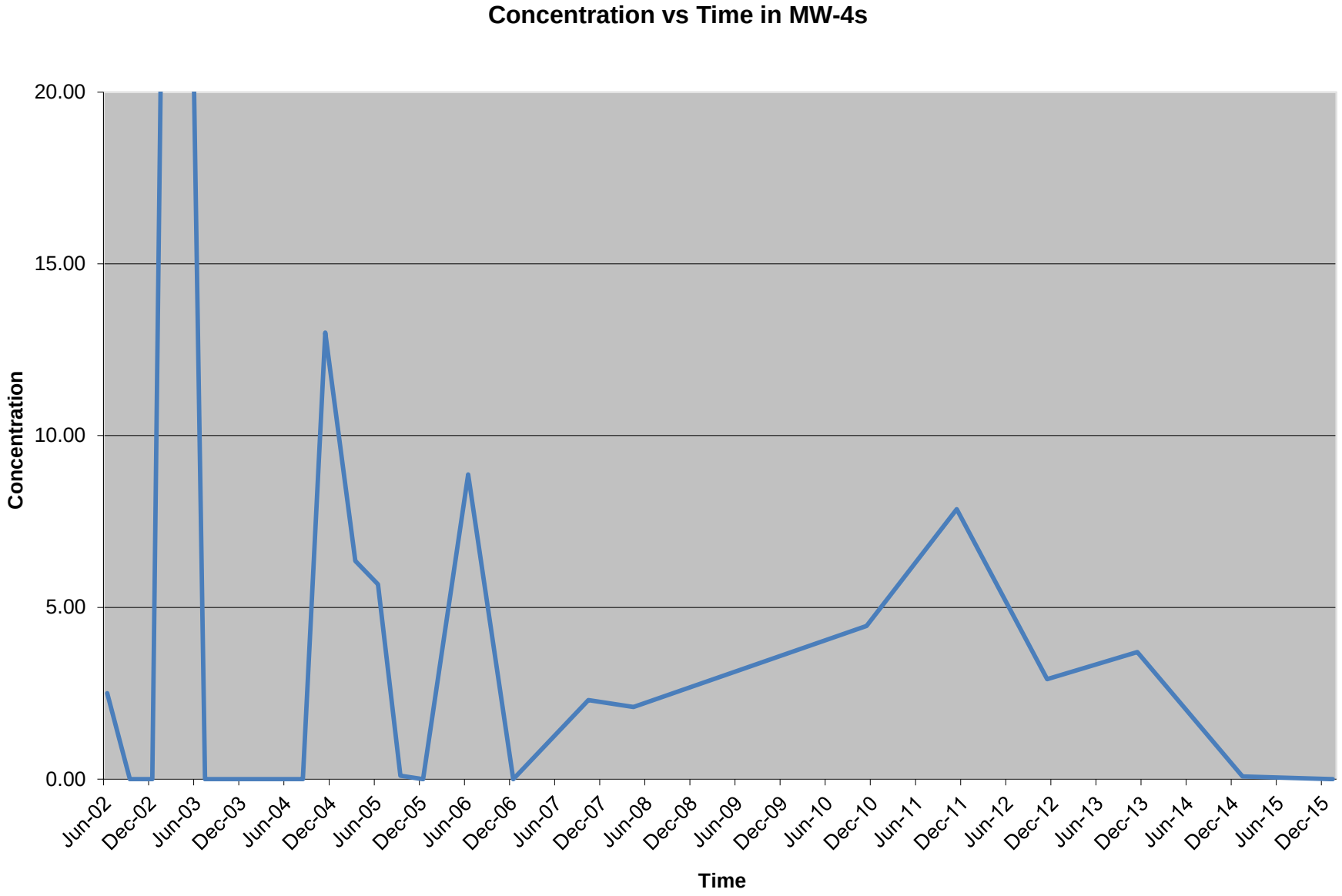
Comments/Resolution:

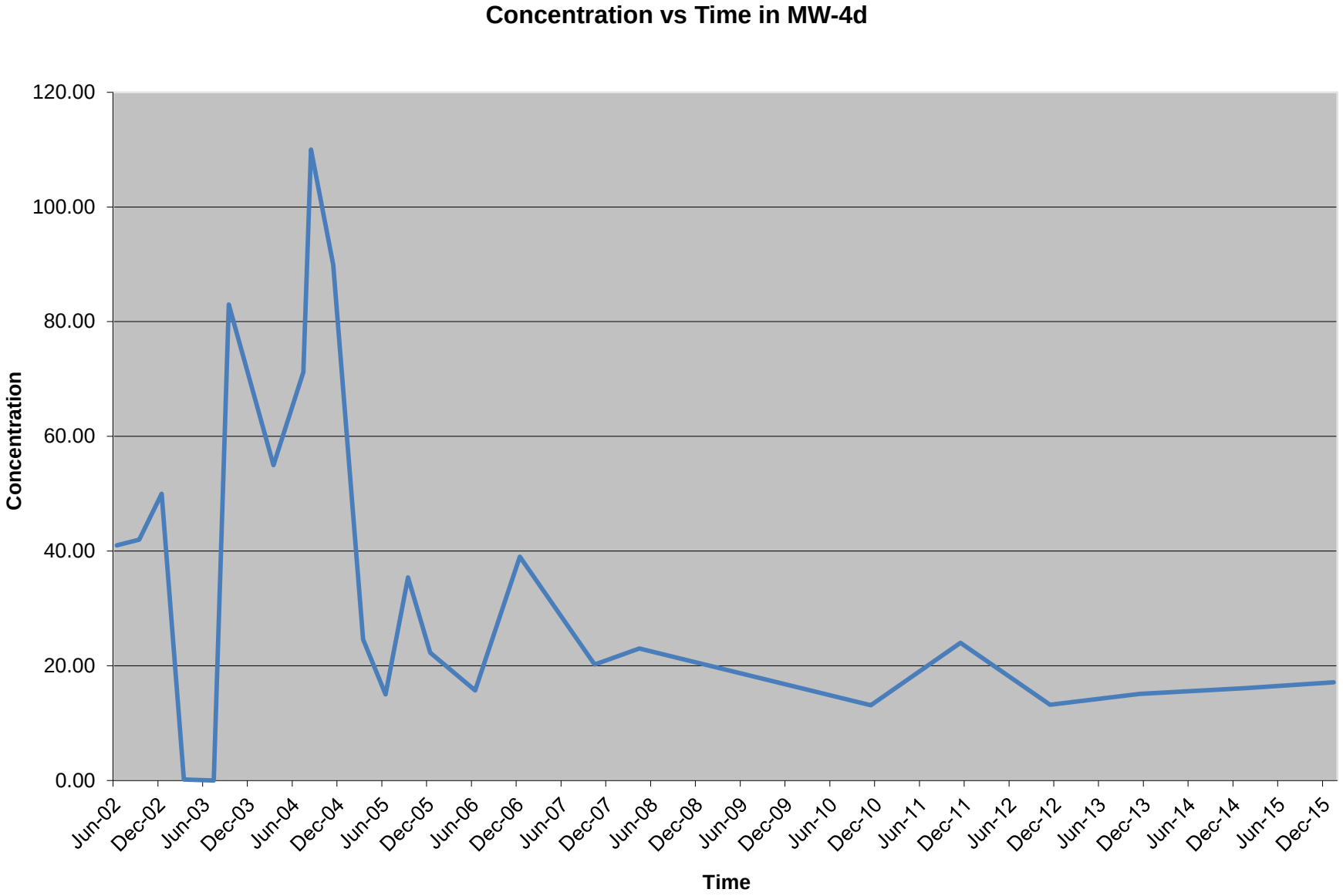
Project Manager SCURF Review: R **Date:** 1/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers).

APPENDIX B

CONCENTRATION VERSUS TIME GRAPHS


Concentration vs Time in MW-4s
20.00
15.00
10.00
5.00
0.00
Concentration
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Jun-09
Dec-09
Jun-10
Dec-10
Jun-11
Dec-11
Jun-12
Dec-12
Jun-13
Dec-13
Jun-14
Dec-14
Jun-15
Dec-15
Time


Concentration vs Time in MW-4d
120.00
100.00
80.00
60.00
40.00
20.00
0.00
Concentration
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Jun-09
Dec-09
Jun-10
Dec-10
Jun-11
Dec-11
Jun-12
Dec-12
Jun-13
Dec-13
Jun-14
Dec-14
Jun-15
Dec-15
Time