FINAL TECHNICAL REPORT

USGS NGWMN Grant G19AC00193 7/15/2019 - 5/14/2022

Wells and Transboundary Conditions at Shingle Landing and Maple Well Stations in Currituck County, NC

Prepared by

N C Department of Environmental Quality
Division of Water Resources
Groundwater Management Branch
512 N. Salisbury St
Raleigh, NC 27604

July 14, 2022

Mark Durway, Hydrogeologist mark.durway@ncdenr.gov (919) 707-9018

Overview of Work Planned and Accomplished

On 7/15/2019, the North Carolina Division of Water Resources (DWR) was awarded a \$234,153 grant (G19AC00193) in support of the USGS National Ground-Water Monitoring Network (NGWMN). During the two-year grant period from 7/15/2019 to 5/14/2022, funding was used to install two groundwater monitoring stations in Currituck County, NC. These stations consist of two wells (735 feet total) at Shingle Landing in Moyock, and two wells (790 feet total) at Maple Airport near Currituck. Shingle Landing well station was completed for a total of \$102,006.25 at a unit cost of approximately \$138.78 per foot, and Maple was completed for a total cost of \$99,468.75 at a unit cost of approximately \$125.91 per foot.

State matching funds of \$219,380 were expended by DWR during the grant period for new wells at Turkey and Pondberry Bay well stations in Sampson County and Chinquapin Elementary School in Duplin County, NC, at an average cost ranging from \$65.90 per foot to \$157.53 per foot.

Wells constructed with grant funds and state matching funds have been added to the state well network and NGWMN.

<u>Description of Work Accomplished under Each Objective</u>

Shingle Landing Well Station

During 2021, following approval of a grant modification related to drilling contract cost increases, two monitoring wells were installed at Shingle Landing well station by Toano Well and Pump Service, Inc. of Toano, VA, using a mud rotary drilling rig and water-based drilling fluid. Consisting of a surficial aquifer well to 25 feet (ft) and a Beaufort aquifer well to 710 ft deep, the station fills an important data gap within the Albemarle-Tidewater area of northeastern North Carolina. This station will aid in resolving transboundary issues related to regional groundwater use, assist with correlation of hydrogeologic units, provide persistent groundwater levels, and be used for periodic water quality testing. The absence of an identifiable Castle Hayne aquifer unit at this station resulted in designating the deep well as a Beaufort aquifer well, though site geology at this location is still subject to interpretation.

Maple Well Station

During 2022, following approval of a second grant modification extending DWR's work completion date, two monitoring wells were installed at the Maple station. This work was also performed by Toano Well and Pump Service using a mud rotary drilling rig and water-based drilling fluid. Consisting of a surficial aquifer well to 30 feet (ft) and a Castle Hayne aquifer well to 760 ft deep, this station also fills an important data gap within the Albemarle-Tidewater area of northeastern North Carolina. This

station will also aid in resolving transboundary issues related to regional groundwater use, assist with correlation of hydrogeologic units, provide persistent groundwater levels, and be used for periodic water quality testing. A planned Yorktown aquifer well was not drilled at this station after receiving permission to install a data logger in a county-owned monitoring well located next to the other two wells. The county's Yorktown well has now been incorporated into DWR's monitoring network and added to the NGWMN registry.

Both Well Stations

Wells drilled at both stations were completed with 4" poly-vinyl chloride (PVC) well casing and 10 to 20 ft of stainless steel or PVC screen. Additionally, screen for the two deep wells was set above a 5 ft section of blank casing with cap to minimize screen clogging with residual suspended solids. Wells were terminated approximately 2.5 ft above grade and protected by a 6" steel casing, locking cap, and 2 ft by 2 ft concrete pad. The wells were then developed by the driller using compressed air injected until water from each well ran clear.

Following well completion, DWR field staff purged each well, measured water levels and water quality field parameters, surveyed casing elevations, and installed water level data loggers. The wells were then added to the state well network and NGWMN at www.ncwater.org/gwmb and https://www.usgs.gov, respectively.

Figures including site maps, geophysical and lithologic logs, well hydrographs, and potentiometric surface maps are provided in Appendix A. A detailed list of all grant and match-funded wells constructed under this grant are tabulated in Appendix B. State GW-1 well construction records are provided in Appendix C, DWR's data management plan is provided in Appendix D., and a copy of the NGWMN grant award is provided in Appendix E.

Description of Work Accomplished with DWR Matching Funds

During the grant period, new and replacement wells were installed at Turkey and Pondberry Bay well stations in Sampson County and Chinquapin Elementary School in Duplin County, NC, at an average cost ranging from \$65.90 per foot to \$157.53 per foot. The total state expenditure for these wells was \$219,380. Well construction, sampling, logging, datalogger installation, and other tasks were performed in the same manner as at the Shingle Landing and Maple well stations.

Data for the grant match wells is accessible through both the NGWMN Registry and DWR websites and well details are provided on the List of Wells in Appendix B.

Work Done as Data Provider in Support of NGWMN

Work completed has consisted of well drilling under Objective 5.

Data Collection and Drilling Activities Completed

Data collection and drilling activities is discussed in previous sections describing work accomplished.

Table of New or Replacement Wells Added to the NGWMN

Well construction and related work completed during this project is overviewed in the List of Wells in Appendix B, Table 1.

Well Construction Details

Well construction details are provided in the GW-1 Well Construction Records in Appendix C.

Methods Used for Data Collection

Methods used for data collection are provided in the Data Management Plan in Appendix D.

Procedures Used to Quality Assure Data Prior to Entry Into NGWMN

Data quality assurance procedures are provided in the Data Management Plan in Appendix D.

Updates to Web Services

In 2020, DWR advised USGS that it had shifted to a new server with separate domain for web services.

Problems Serving Data to the NGWMN Data Portal

There have been no problems serving data to the NGWMN portal and services have recently been enhanced under a separate NGWMN grant to include expanded groundwater quality analytical data.

Setting and Hydrogeology of Monitoring Stations

The Shingle Landing and Maple groundwater monitoring stations are situated in the northeastern coastal plain physiographic province at approximately 6 ft above mean sea level (MSL). Relative to nearby points of reference, the monitoring stations are each located several miles west of the Atlantic Ocean and near the North Carolina - Virginia state line.

The general region these monitoring stations are located is referred to in this report as the Albemarle-Tidewater area and consists of northeastern North Carolina and southeastern Virginia. The general boundaries of the Albemarle-Tidewater area are the James River and Chesapeake Bay to the north, the Atlantic Ocean to the east, the Albemarle Sound to the south, and the Chowan and Blackwater Rivers to the west. Elevation of the Albemarle-Tidewater area generally increases from east to west ranging from sea level to nearly 100 ft above sea level. The terrain within the area is generally broad and flat to the east becoming dissected and gently rolling to the west.

The geology of the area consists of Recent to Cretaceous coastal plain sediments which dip and thicken eastward. Based on well records, basement bedrock consists of igneous and metamorphic bedrock, and in localized areas, Triassic basin sediments. Depth to basement in the vicinity of the two monitoring stations is estimated to be 2500 ft or more below land surface. The geology of the Albemarle-Tidewater area is complicated by multiple marine transgression and regression events, and structural and stratigraphic complexities related to the Chesapeake Bay impact crater of 35 million years ago.

Principal Aquifers within the Albemarle-Tidewater area consist of the Surficial, Castle Hayne, and Northern Atlantic coastal plain aquifer systems, the latter of which includes the Beaufort, Upper Cape Fear, and Lower Cape Fear North Carolina aquifers. The two wells constructed at the Shingle Landing station are screened in the surficial and Beaufort aquifers and the two wells constructed at the Maple station are screened in the surficial and Castle Hayne aquifers.

Within the Albemarle-Tidewater area, chlorides and other dissolved solids generally increase in all aquifers with increasing depth and proximity to the Atlantic Ocean. Recent groundwater and chloride data for the Shingle Landing and Maple monitoring stations are summarized in Appendix B.

Regional Hydrogeology and Transboundary Conditions

The Albemarle-Tidewater area lies in the Northern Atlantic Coastal Plain. Within this area, aquifer names used in North Carolina, Virginia, and by the USGS often vary, as shown in Table 1. The absence of consistent, uniform naming conventions frequently makes correlating geologic and hydrologic units across state boundaries difficult. The geologic and water level data from the new monitoring stations is expected to aid in resolving such transboundary conditions within the Albemarle-Tidewater area.

Acknowledgements

Special thanks are extended to Currituck County for assistance throughout this project, in particular Eric Weatherly, County Engineer, and Will Rumsey, Public Utilities Director.

Disclaimer

The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Geological Survey. Mention of trade names or commercial products does not constitute their endorsement by the U.G. Geological Survey.

Copies for USGS

PDF copies of this report are being submitted to:

Daryll Pope <u>dpope@usgs.gov</u>
Bill Cunningham <u>wcunning@usgs.gov</u>

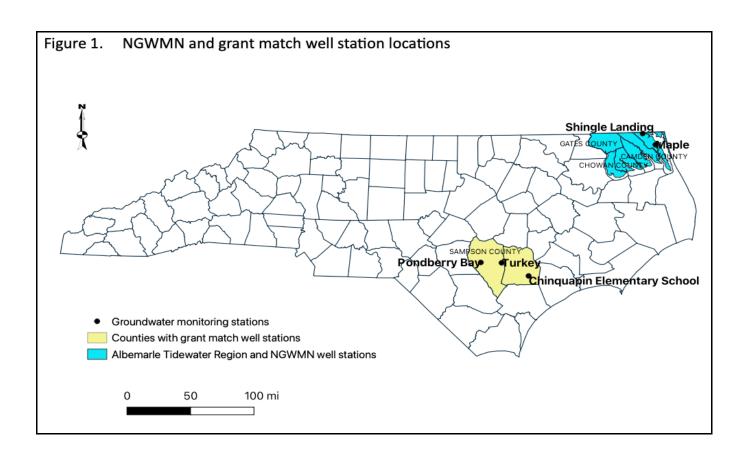
References

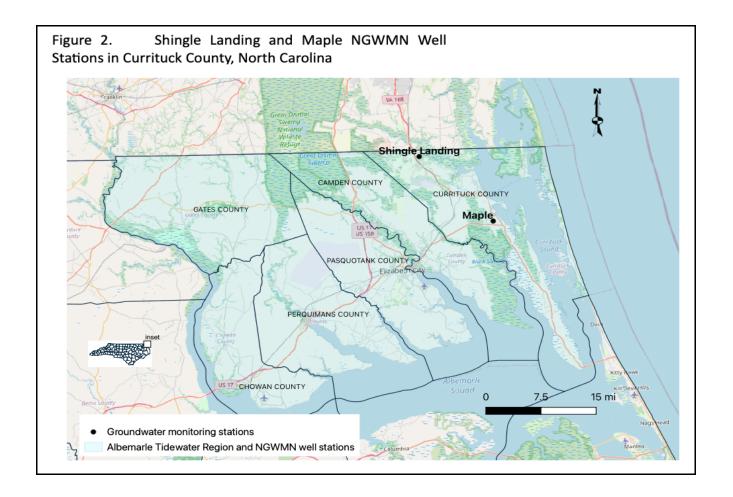
- 1) Subcommittee on Ground Water of the Advisory Committee on Water Information, 2009 (revised 2013), A national framework for ground water monitoring in the United States: Advisory Committee on Water Information, accessed January 2017, at https://acwi.gov/sogw/ngwmn framework report july2013.pdf.
- 2) USGS NGWMN Cooperative Agreement G19AC00193.
- 3) Cunningham, William L., Thomas E. Reilly, Daryll Pope, April 25, 2016, Use of the National Ground-Water Monitoring Network to Evaluate Selected Transboundary Aquifer Systems, presentation at NGWA Groundwater Summit, Denver, CO.
- 4) https://cida.usgs.gov/ngwmn/
- 5) http://www.ncwater.org/gwmb
- 6) Lautier, Jeff C., 1998, Hydrogeologic Framework and Ground Water Resources of the North Albemarle Region, North Carolina: NC Department of Environment and Natural Resources, Division of Water Resources, 61 p.

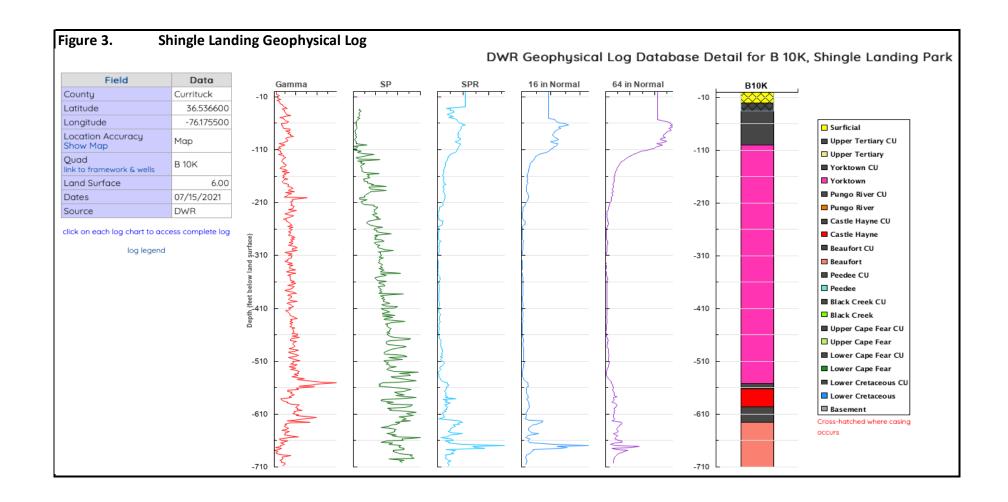
- 7) Status of Virginia's Water Resources, October 2018, A Report on Virginia's Water Resources Management Activities, Virginia Department of Environmental Quality, Commonwealth of Virginia, 49 p.
- 8) McFarland, E. Randolph and T. Scott Bruce, 2006, The Virginia Coastal Plain Hydrogeologic Framework, U. S. Geological Survey Professional Paper 1731, 119 p.
- 9) Trapp, Henry, Jr., and Marilee A. Horn, 1997, Ground Water Atlas of the United States, Hydrologic Investigations Atlas 730-L, Segment 11 Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, West Virginia: U.S. Geological Survey, --p. (https://pubs.usgs.gov/ha/730l/report.pdf).

Appendix A

FIGURES







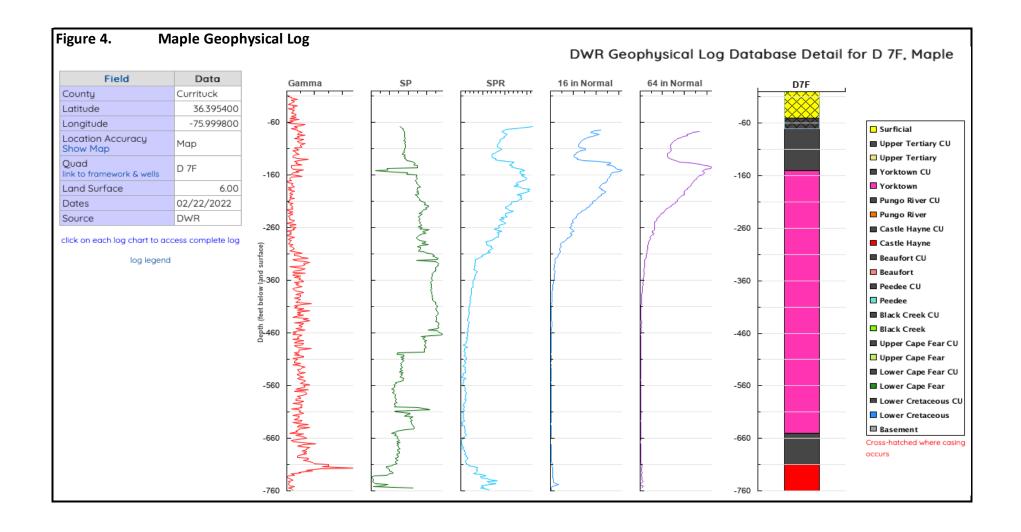


Figure 5.	Shingle	Landing	Lithol	ogic Log
-----------	---------	---------	--------	----------

Quad	B 10K				
Well Name	Shingle Lan	Shingle Landing			
County	Currituck				
Lat	36.5366				
Lon	-76.1755				
Driller	Toano Wel	l and Pum	p Co.	, Inc.	
Log	Toano Wel	l and Pum	p Co.	, Inc.	
TD (ft)	710				
Elevation (ft)	5.72				

Unit Top (bls)	Depth (ft)		<u>Lithology</u>	<u>Color</u>
Surficial (0 ft)	0	1	10	shell hash	yel gy, lt gy
	10	1	20	sand	med gy
Yorktown (20 ft)	20	-	175	silt with shell, calc	dk grn gy
(no substantial	175	1	205	silt with abun soft "black sand" glauconite or phosphate; high	dk grn gy
Yorktown				gamma, hard around 200-205; silt similar to 40-175	
permeability identified)					
	205	-	220	silt	dk grn gy
	220	1	310	silt, sticky, predom non to sli calc, occ shell beds, clayey, clay increasing with depth	gy ol green
	310	-	552	clay with silt, uniform texture, sli calc, minor mica and black specks	dk grn gy
	552	1	560	sandy silt with thin calc bands, high gamma though no phosphate obsvd, similar to 310-553	dk grn gy
Castle Hayne (562')	560	- 1	620	silt with abun 'black sand'; abun vf-c qtz grains, loose, varying from clr, wh, gy, grn, rose, orng; high gamma 610-620, 625	dk grn gy
Beaufort (625 ft)	620	-	630	sand with calc and silt; notable color change for this interval	dusky yel, lt ol brn
	630	-	655	silt with sand	grn gy
	655	1	660	silt with abun black wood up to 0.5 inch and small qtz pebbles	ol gy
	660	-	710	silt with sand, occ mica, occ calc-cmtd sandstone, occ glauc; distinct lithologic change at 660	ol gy

<u>Comments</u>

all depths in feet (ft)

log describes bulk lithology and wet sample colors

bls = feet below land surface

Also see GW-1 well construction record at back of appendices

Maple I	Litholo	gic l	_og
D 7F			
Maple			
Currituck			
36.3954			
-75.9998			
Toano Wel	l and Pun	пр Со	., Inc.
Toano Wel	ll and Pun	пр Со	., Inc.
760			
6			
	D 7F Maple Currituck 36.3954 -75.9998 Toano Wel Toano Wel	D 7F Maple Currituck 36.3954 -75.9998 Toano Well and Pun Toano Well and Pun 760	Maple Currituck 36.3954 -75.9998 Toano Well and Pump Co Toano Well and Pump Co

Unit Top (bls)	Depth (ft)		Lithology	<u>Color</u>
	0	ı	20	sand	It gray
Yorktown confining unit (20 ft)	20	-	30	clay with small pelecypods (1/8 in)	gray
	30	-	150	clay with shell hash interbeds	II
Yorktown aquifer (150 ft)	150	-	160	shell hash with abun turitella	gray to white
	160	-	190	shell hash	gray to white
	190	-	230	shell hash with color change	light brown and gray
	230	-	300	clay with shell hash interbeds	gray
	300	-	700	clay	gray
Castle Hayne aquifer (710 ft)	700	-	720	clay with fine sand, phosphate, glauconite,	gray
				and shark and ray fossil fragments; gamma spike 703-720 ft	
	720	-	730	limestone	gray to light gray
	730	-	740	limestone	gray to light gray
	740	-	750	limestone	gray to light gray
	750	-	760	marl/clay	light gray to white

<u>Comments</u>

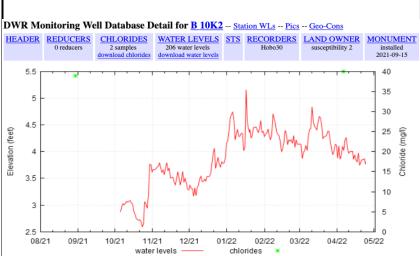
all depths in feet (ft)

log describes bulk lithology and wet sample colors

bls = feet below land surface

Also see GW-1 well construction record at back of appendices

Figure 7. Shingle Landing Hydrographs and Well Data from DWR Webpage



<u>Field</u>	Data
County	Currituck
Quad Show Map	B 10K2
Name	Shingle Landing Shingle Landing Site Map.pdf
USGS Netname	
USGS ID	
Region	5
Latitude	36.536716
Longitude	-76.175390
Location Accuracy	G
Aquifer	S
Land Surface NED elevation = 5.72 feet	6
Measuring Point	3.35
Date Constructed	07/21/2021
Diameter	4
Outer Protective Casing Diameter	6
Depth	25
Casing Material	
Top of Screen	15
Bottom of Screen	25

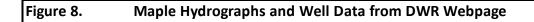
Shingle Landing - Well B 10K1 (Beaufort Aquifer)

Shingle Landing - Well B 10K2 (Surficial Aquifer)

DWR Monitoring Well Database Detail for B 10K1 -- Station WLs -- Pics -- Geo-Cons

HE	ADER	REDUCERS 0 reducers	CHLORIDES 2 samples download chlorides	WATER LEVELS 205 water levels download water levels	STS	RECORDERS Hobo30, Hobo13	LAND OWNER susceptibility 2	MONUI instal 2021-0	lled
	-0.8							2500	
	-0.9		Λ				*		
	-1							2000	
(feet)	-1.1	. *	/VWI\	٧٨				1500	mg/l)
Elevation (feet)	-1.2			" 'MM	$H_{\mathbf{H}}$	Mint	J. A.		Chloride (mg/l)
Elevi	-1.3			*	'\	" WYV	MM///M	1000	Chlo
	-1.4 -1.5	-		V	,,	' \\/Y'\	V V V V V	500	
	-1.6 08/2	21 09/21	10/21 11/2 water I		22 chlor	02/22 03/2 ides ×	2 04/22 05	0	

<u>Field</u>	Data
County	Currituck
Quad Show Map	B 10K1
Name	Shingle Landing Shingle Landing Site Map.pdf
USGS Netname	
USGS ID	
Region	5
Latitude	36.536716
Longitude	-76.175390
Location Accuracy	G
Aquifer	Tb
Land Surface NED elevation = 5.72 feet	6
Measuring Point	3.30
Date Constructed	07/20/2021
Diameter	4
Outer Protective Casing Diameter	6
Depth	710
Casing Material	
Top of Screen	660
Bottom of Screen	680





<u>Field</u>	Data
County	Currituck
Quad Show Map	D 7F1
Name	Maple
USGS Netname	
USGS ID	
Region	5
Latitude	36.395400
Longitude	-75.999800
Location Accuracy	G
Aquifer	S
Land Surface NED elevation = 5.97 feet	0
Measuring Point	
Date Constructed	03/08/2022
Diameter	4
Outer Protective Casing Diameter	6
Depth	30
Casing Material	SCH 40 PVC
Top of Screen	15
Bottom of Screen	25

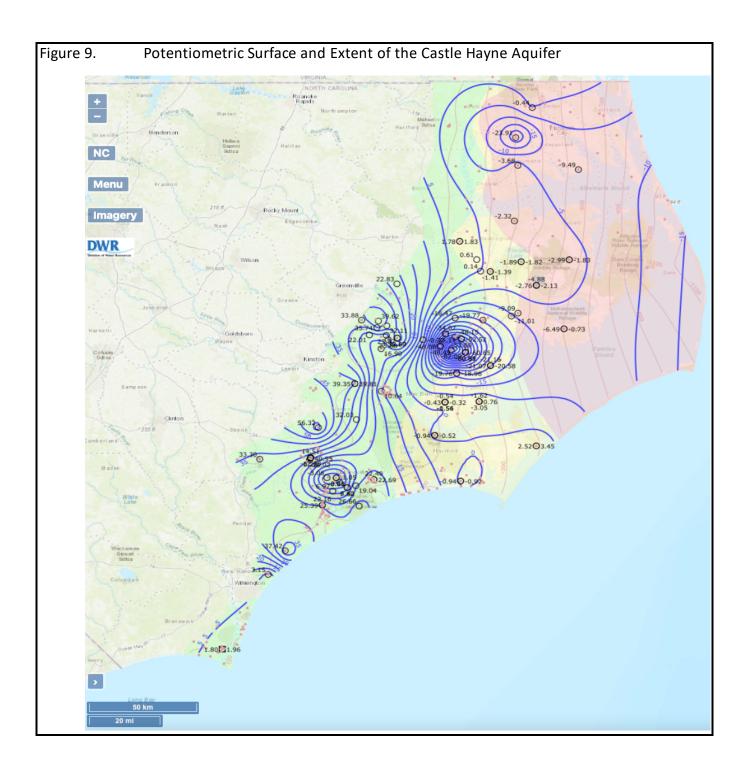
Maple - Well D 7F3 (Castle Hayne Aquifer)

Maple - Well D 7F1 (Surficial Aquifer)

DWR Monitoring Well Database Detail for <u>D 7F3</u> -- <u>Station WLs</u> -- <u>Pics</u> -- <u>Geo-Cons</u>

HE	EADER	REDUCERS 0 reducers	CHLORIDES 1 samples download chlorides	WATER LEVELS 3 water levels download water levels	<u>STS</u>	RECORDERS Hobo30, Hobo13	LAND OWNER susceptibility 2	MONUME installed 2022-06-13	
	-13.2							7000	
	-13.4							6000	
	-13.6							5000	
n (feet)	-13.8	_					<u> </u>	4000	6
Elevation (feet)	-14						ļ	4000 (Jack)	
	-14.2							2000	,
	-14.4							1000	
	-14.6 06	/22 06/22	06/22 06/22 water	06/22 06/22 levels	06/2 chlor	2 06/22 06 rides *	5/22 06/22 06	0 6/22	

<u>Field</u>	Data
County	Currituck
Quad Show Map	D 7F3
Name	Maple
USGS Netname	
USGS ID	
Region	5
Latitude	36.395400
Longitude	-75.999800
Location Accuracy	G
Aquifer	Tch
Land Surface NED elevation = 5.97 feet	0
Measuring Point	
Date Constructed	03/08/2022
Diameter	4
Outer Protective Casing Diameter	6
Depth	760
Casing Material	SCH 40 PVC
Top of Screen	730
Bottom of Screen	750



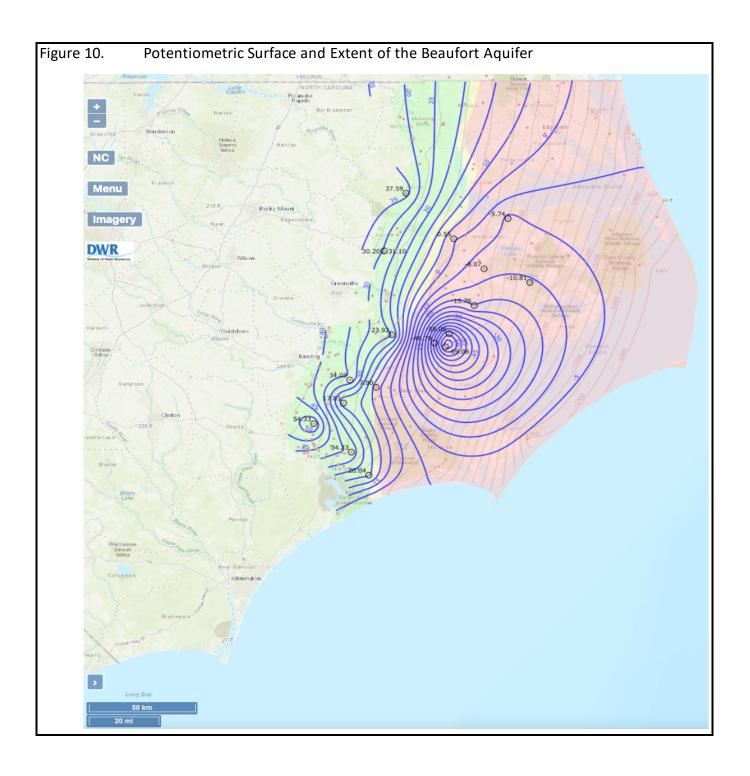


Figure 11. Wells at Shingle Landing

Figure 12. Wells at Maple



Yellow well on left is an existing Yorktown aquifer well which Currituck County has allowed DWR to equip with a water level logger.

Appendix B

TABLES

Table 1.	List of Wells																					
						Screen To	p Screen	NC Aquifer				Principal Aquifer		NGWMN Well			Latest Water					-
NGWMN ID	Name	County	Funding Source	Elevation (ft)	Depth (ft)	(ft)	Bottom (ft)	Code	NC Aquifer Name	VA Aquifer Name	Principal Aquifer Name		Well Replaced and Gap Filled	Replaced	Well Cost per Foot	Average Well Cost	Level (ft)	Water Level Date	Chloride (ppm)	Chloride Date	Latitude	Longitude
B 10K2	Shingle Landing	Currituck	G19AC00193	6.00	25	:	15 25	S	Surficial	Surficial	Surficial aquifer system	S100SURFCL	Fill Gap in Network	None	\$138.78	\$3,469.60	3.13	4/25/22	40	4/7/22	36.536716	-76.17539
B 10K1	Shingle Landing	Currituck	G19AC00193	6.00	710	6	60 680	Tb	Beaufort	Aquia/Brightseat	Northern Atlantic Coastal Plain aquifer system	S100NATLCP	Fill Gap in Network	None	\$138.78	\$98,536.65	7.11	4/25/22	2257	4/7/22	36.536716	-76.17539
			•		735	;			•							\$102,006.25						
D 7F1	Maple	Currituck	G19AC00193	6.00	30) :	15 25	S	Surficial	Surficial	Surficial aquifer system	S100SURFCL	Fill Gap in Network	None	\$125.91	\$3,777.29	pending	pending	pending	pending	36.3954	-75.9998
D 7F3	Maple	Currituck	G19AC00193	6.00	760	7:	30 750	Tch	Castle Hayne	Calvert	Castle Hayne aquifer	N400CSLHYN	Fill Gap in Network	None	\$125.91	\$95,691.46	pending	pending	pending	pending	36.3954	-75.9998
		•	•		790)	•		•				•		•	\$99,468.75						
U 34B10	Turkey	Sampson	NC DWR match	135.83	39)	22 32	S	Surficial	Surficial	Surficial aquifer system	S100SURFCL	Fill Gap in Network	None	\$65.90	\$2,570.11	6.87		<32	3/8/22	34.988899	-78.189357
U 34B11	Turkey	Sampson	NC DWR match	135.80	142	1	27 137	Kbc	Black Creek	Virginia Beach	Northern Atlantic Coastal Plain aquifer system	S100NATLCP	Abandon and Replace Well 4	None	\$65.90		38.45		<32		34.988899	-78.189357
U 34B12	Turkey	Sampson	NC DWR match	136.15	260	24	45 255	Kbc	Black Creek	Virginia Beach	Northern Atlantic Coastal Plain aquifer system	S100NATLCP	Abandon and Replace Well 6	None	\$65.90	\$17,134.04	41.63	4/28/22	<29	4/11/22	34.988899	-78.189357
U 34B13	Turkey	Sampson	NC DWR match	135.99	335	3	20 330	Kucf	Upper Cape Fear	Potomac	Northern Atlantic Coastal Plain aquifer system	S100NATLCP	Fill Gap in Network	None	\$65.90	\$22,076.55	42.31	4/28/22	<29		34.988899	-78.189357
U 34B14	Turkey	Sampson	NC DWR match	135.83	446	4:	27 437	Klcf	Lower Cape Fear	Potomac	Northern Atlantic Coastal Plain aquifer system	S100NATLCP	Fill Gap in Network	None	\$65.90	\$29,391.47	50.83	4/28/22	<29	4/11/22	34.988899	-78.189357
					1222	2										\$80,530.00						
U 37D1	Pondberry Bay	Sampson	NC DWR match	165.80	38		26 36	S	Surficial	Surficial	Surficial aquifer system	S100SURFCL	Fill Gap in Network	None	\$109.88	\$4,175.54	9.92		<32		34.995133	
U 37D3	Pondberry Bay	Sampson	NC DWR match	166.02	199	1	75 185	Kbc	Black Creek	Virginia Beach	Northern Atlantic Coastal Plain aquifer system	S100NATLCP	Fill Gap in Network	None	\$109.88	\$21,866.67	38.27	4/28/22	<32	3/8/22	34.995133	-78.478227
U 37D2	Pondberry Bay	Sampson	NC DWR match	166.45	360	31	03 313	Kucf	Upper Cape Fear	Potomac	Northern Atlantic Coastal Plain aquifer system	S100NATLCP	Fill Gap in Network	None	\$109.88	\$39,557.79	144.88	4/28/22	70	3/8/22	34.995133	-78.478227
					597	,										\$65,600.00						
W 29D13	Chinquapin Elementary School	Duplin	NC DWR match	42.21	465	4	50 460	Kucf	Upper Cape Fear	Potomac	Northern Atlantic Coastal Plain aquifer system	S100NATLCP	Fill Gap in Network	None	\$157.53	\$73,250.00	39.95	5/9/22	<32	4/12/22	34.82593	-77.816446
					465	,										\$73,250.00						

Key

water level in feet above or below top of casing or other measuring point (negative value indicates feet above measuring point) chloride detection limit (parts per million, ppm)

Appendix C

GW-1 WELL CONSTRUCTION RECORDS

WELL CONSTRUCTION R	ECORD (GW-1)	For	Inter	nal Us	se Only	/:					
1. Well Contractor Information:											
Charles N Dozier											
Well Contractor Name		14. V		R ZON	ES	DESCRIPT	TION				
4088-A		17	ft.	27	ft.	surficia					
			ft.		ft.	- Carnola	-				
NC Well Contractor Certification Number	-	15. 0	UTER	CASI	NG (for	multi-cased	wells)	OR LIN	ER (if an	nlicable	1
Toano Well and Pump	Service Inc,	FROM	И	то		DIAMETE	R	THICH	CNESS		ERIAL
Company Name		16.10	ft.	CACIN	ft.		in.				
2. Well Construction Permit #:		FROM	ANER A	TO	G OK I	UBING (geo		THICK		MAT	ERIAL
List all applicable well construction permits (i.e.	UIC, County, State, Variance, etc.)	3	ft.	17	ft.	4.5	in.	SDR	17	PVC	
3. Well Use (check well use):			ft.		ft.		in.				
Water Supply Well:		FROM	CREE	N TO		DIAMETER	SLO	T SIZE	THICK	NESS	MATERIAL
□Agricultural	□Municipal/Public	399820000	ft.	27	ft. 4		0.02		Sch 4	account.	PVC
Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)		ft.		ft.	in.					
□Industrial/Commercial	□Residential Water Supply (shared)		ROUT								
□Irrigation Non-Water Supply Well:	□Wells > 100,000 GPD	FROM	ft.	ТО	ft.	MATERIA				NT MET	HOD & AMOUNT
Monitoring	ПРоссия	15		0		Quick G	Prout	Trer	nmie		
Injection Well:	□Recovery		ft.		ft.						1
□Aquifer Recharge	☐Groundwater Remediation		ft.		ft.						
□Aquifer Storage and Recovery	□Salinity Barrier	19. SA FROM		TO	L PACE	(if applical MATERIA)			EMBI A	CEMENI	EMETHOD
□Aquifer Test	□Stormwater Drainage	15	ft.	27	ft.	#3 Silica			Tremn		T METHOD
□Experimental Technology	□Subsidence Control		ft.		ft.	"O Omo	и		TICITIII	1110	
□Geothermal (Closed Loop)	□Tracer	20. D	RILLI	NG LO	G (attac	h additional	sheets	s if nece	ssarv)	ding States a	
☐Geothermal (Heating/Cooling Return)	□Other (explain under #21 Remarks)	FROM	1	то		DESCRIPT	ION (co	olor, hard	ness, soil/r	ock type,	grain size, etc.)
4. Date Well(s) Completed: 7-21-202		10	ft.	10 20	ft.	Shell Ha	ash				
		20	ft.		ft.	Silt with	Cha	.11			
5a. Well Location:		20	ft.	27		Siit With	Sne				
NCDENR					ft.					-	
Facility/Owner Name	Facility ID# (if applicable)		ft.		ft.						
219 Arrow Head LN M	oyock NC 27958		ft.		ft.			200			
Physical Address, City, and Zip Currituck		21. R	ft. EMAR	rks -	ft.		- Accept				
		27.70	231127 841	CALL!							
County	Parcel Identification No. (PIN)			·	-						
5b. Latitude and longitude in degrees/mit (if well field, one lat/long is sufficient)	nutes/seconds or decimal degrees:	22. Ce	rtific	ation:							
36.536716 $_{N}$ -76	6.175390 _w			1							
	**	1	1/1	16	//	7	***	(1) Hara and Hara		10	2-6-21
6. Is(are) the well(s): Permanent or	□Temporary	Signatu	te of t	ertified	Well Co	ontractor				Date	
If this is a repair, fill out known well construction		15A NO	CAC 02	C.0100	0 or 15A	certify that the NCAC 02C . ed to the well	0200 V	Well Con	vere) cons struction	tructed i Standari	n accordance with ds and that a copy
repair under #21 remarks section or on the back of 8. For Geoprobe/DPT or Closed-Loop Geonstruction, only 1 GW-1 is needed. Indicates the construction of the section of the back of the section of the back of the section of the back of	eothermal Wells having the same	You n	nay us	se the l	back of	this page to Box). You	o prov	vide ad	ditional v	well cor	nstruction info ges if necessary.
drilled:										Pu	6-0 100000m y.
9. Total well depth below land surface: For multiple wells list all depths if different (exan	27 (ft.)					RUCTIONS a 30 days of		comple	tion per	the fol	lowing:
10. Static water level below top of casing If water level is above casing, use "+"	: <u>5</u> (ft.)	24a. I	For A	ll We	lls: Ori	iginal form nit, 1617 M:	to D	Division aleigh,	of Wat NC 2769	ter Res 9-1617	ources (DWR),
11. Borehole diameter: 10	(in.)	24b. F Progra	For In	jection 36 MS	Wells C, Rale	: Copy to I	OWR, 699-16	Under	ground I	njectio	n Control (IUC)
12. Well construction method: Mud	Kotary	24c. F	or Wa	ater Su	ipply ai		oop G	eother	mal Retunty wher	urn We	ells: Copy to the
FOR WATER SUPPLY WELLS ONLY	:	24d. F	or W	ater V	Vells pr	oducing ov	er 10	0,000 C	GPD: Co	py to I	WR, CCPCUA
13a. Yield (gpm) M	Method of test:	Permit	Progr	ram, 10	611 MS	C, Raleigh,	NC 2	7699-1	611		
13b. Disinfection type:	Amount:										

L. Walt Contractor Enformations Charles N Dozeler	WELL CONSTRUCTION R	ECORD (GW-1)	For	Inter	nal Us	e Onl	y:			-		
Section Continue	1. Well Contractor Information:					*** ***********************************	, .					
Well Coarsear Certification Number Toano Well and Pump Service Company Name 2. Well Coarsear Certification Number Toano Well and Pump Service Company Name 2. Well Coarsear Certification Number Toano Well and Pump Service Company Name 2. Well Coarsear Certification Number Toano Well and Pump Service Company Name 2. Well Coarsear Certification Number 1. No. 10. 10. 10. 10. 10. 10. 10. 10. 10. 10			<u> </u>									
NC well commence Certification Number TOADO Well and Pump Service Congruey Name 2. Well Construction Permit 8: List all applicables of Congruey Name 2. Well Construction Permit 8: List all applicables of Congruey Name 2. Well Construction Permit 8: List all applicables of Congruey Name 2. Well Construction Permit 8: List all applicables of Congruey Name 2. Well Construction Permit 8: List all applicables of Congruey Name 2. Well Construction Permit 8: List all publicables of Congruey Name 2. Well Construction Permit 8: List all publicables of Congruey Name 2. Well Construction Permit 8: List all publicables of Congruey Name 2. Well Construction Permit 8: List all publicables of Congruey Name 2. Well Construction Permit 8: List all publicables of Congruey Name 2. Well Construction Permit 8: List all public Name 2. Well Construction Permit 8: List all public Name 2. Well Construction Permit 8: List all public Name 2. Well Construction Permit 8: List all public Name 2. Well Construction Permit 8: List No. No. List Name Name 2. Solve Name 2. No. No. No. Name 2. No. Name 2. No. No. Name 2. No. Name 2. No. No. Name 2.						S	DESCRIPT	TION			150 MEX	
No. Well Contractor Certification Number To ano Well and Pump Service Company Name 2. Well Construction Permit #: Last all applicable well and pump Service S. Well Loss Active well and pump Service (S. OUTS RESIDENCE CASING OR TUBINO (geother and doesd-step)) 1. South Well (S. OUTS RESIDENCE Permit #: Last all applicable well and pump Service (S. U.C. Comp. State, Furturecc. etc.) 3. Well Live (shock well use): Water Supply Well: Capticultural [Conting Supply) [Chared] Ultrigation Chared (Hosting/Cooling Supply) Checkderinal Water Supply (single) Unaquifer Storage and Recovery Chared (Hosting/Cooling Well) Chare						ft.						
Toano Well and Pump Service Company Name 2. Well Construction Fermit #: List of applicable and Commandation permits (s.e. URC. Come), State, Fortenere, etc. J 3. Well Use (check well use): Were Supply Well: Charicaltural Cooling Supply) Cloriduratia/Commercial Cloridural (Heating/Cooling Supply) Cloriduratia/Commercial Cloridural (Heating/Cooling Supply) Cloriduratia/Commercial Cloridural Commercial Technology Cloridural Commercial Technology Cloridural Commercial Cloridural Commercial Technology Cloridural Commercial Technology Cloridural Commercial Technology Cloridural Commercial Technology Cloridural Commercial Com				ft.		ft.						
Company Name Comp	MINISTER AND LINE OF THE PROPERTY OF THE PROPE	0 1	15. 0	UTER	CASIN	G (for	multi-cased	wells)	OR LIN	ER (if ar	oplicable	e)
Section Sect	Toano Well and Pump	Service	FROM	<u> </u>	то		DIAMETE	R	THICK	ENESS		
2. VetI Construction Fermit #:	Company Name						1				pvc	-
3. Well Use (check well use): Water Supply Well: Cargicultum Circumbermal (Heating-Cooling Supply) Circumbermal (Circumbermal Circumbermal Circu	2. Well Construction Permit #:		FROM		TO	GUR	DIAMETE	otherm R	THICK	(NESS	MAT	ERIAL
Water Supply Well: Claringtion Claring	List all applicable well construction permits (i.e.	UIC, County, State, Variance, etc.)	+2.5	ft.	660	ft.	4.5	in.	SDR	17		
Water Supply Well: Cagricultural Charlespeed Charl	3. Well Use (check well use):		705	ft.	710	ft.	4	in.	SCH	40	Stair	nless
Mannicipal/Public Cocontemnal (Heating/Cooling Supply) Residential Water Supply (single) Recovery Residential Value (single) Recovery Residential Value (single) Residential	Water Supply Well:											
Continement	□Agricultural	□Municipal/Public		-		-						
Claring attorn Clar	☐Geothermal (Heating/Cooling Supply)	□Residential Water Supply (single)	000					0.02	20	ЗСП	40	Stainless
Recovery	□Industrial/Commercial	□Residential Water Supply (shared)	18 G			entablesse						
Dispection Well: Carpoint Well: Ca		□Wells > 100,000 GPD					MATERIA	L	EMP	LACEME	NT MET	HOD & AMOUNT
Disperimental Technology	The second secon		650.	ft.	0	ft.	Quick G	Prout	Pun	nped v	ia Tre	emmie
□Aquifer Recharge □Aquifer Recharge □Aquifer Storage and Recovery □Aquifer Test □Scinwater Drainage □Experimental Technology □Geothermal (Closed Loop) □Tracer □Geothermal (Closed Loop) □Tracer □Geothermal (Closed Loop) □Tracer 4. Date Well(s) Completed: 7/15/2021 Well Diff B 10K 5a. Well Location: NCDENR Shingle Landing Pacility/Dwer Name 219 Arrow Head Ln Physical Address, City, and Zip Currituck County Parcel Identification No. (PIN) 5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees: (if well field, one halfwag is sufficient) 36. 536716 N −76.175390 N 6. Is(are) the well(s): Permanent or □Temporary 7. Is this a repair to an existing well: □Yes or □No (Pith is a repair) fluid whom well construction information and explain the nature of the repair under #21 romarks section or on the back of this form. 8. For Geoprobe/DFT or Closed-Loop Geothermal Wells having the same construction, (pin) 1 GW-1 is needed. Indicate TOTAL NUMBER of wells dirilled: 9. Total well depth below land surface: 710 (ft.) FROW 10 n. #3 SIRILLING LOG (tattesh additional sheets if facessary) 10 n. 10 n. Clay and shell 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. 20 n. Sand will to clay and sillt 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. 20 n. Sand 220 n. Sand will to clay and sillt 10 n. Sand wil	<u> </u>	□Recovery		ft.		ft.						
□ Aquifer Storage and Recovery □ Salinity Barrier □ Stormwater Drainage □ Experimental Technology □ Subsidence Control □ Tracer □ Coeothermal (Closed Loop) □ Tracer □ Coeothermal (Heating/Cooling Return) □ Other (explain under #21 Remarks) 4. Date Well(s) Completed: 7/15/2021 4. Date Well(s) Completed: 8 Shingle Landing Facility/Owner Name Facility/Owner Name Facility/Owner Name Facility DB (if applicable) 219 Arrow Head Ln Physical Address, City, and Zip Currituck County Parcel Identification No. (PIN) 5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lationg is sufficient) 36.536716 N −76.175390 6. Is(are) the well(s): □ Permanen or □ Temporary 7. Is this a repair to an existing well: □ Yee or □ No If his is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of his form. 8 For Geoprobe/DFT or Closed-Loop Geothermal Wells having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells diffiled. 9 Total well depth below land surface: 710 10. Static water level below top of casing: (ft.) 11. Borehole diameter: 10 11. Borehole diameter: 10 12. Well construction method: MUd Rotary (i.e. super, roary, cable, direct pash, et.) FOR WATER SUPPLY WELLS ONLY: Static water level below top of casing: (ft.) FOR WATER SUPPLY WELLS ONLY: 244. For All Wells: Copy to DWR, Underground Injection Control (if Program, 1611 MSC, Reliegh, NC 27699-1613 244. For Mater Supply and Openoide gover 100,000 GPD: Copy to DWR, CCRC Program, 1611 MSC, Reliegh, NC 27699-1613 244. For Water Supply All Openoides well for No. (7760-1617) 245. For Water Wells producing ever 100,000 GPD: Copy to DWR, CCRC Program, 1611 MSC, Reliegh, NC 27699-1613 246. For Water Supply and Openoides well for No. (7760-1617) 247. For Mater Wells producing ever 100,000 GPD: Copy to DWR, CCRC	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Groundwater Remodiation		ft.		ft.						
Claquiter Test			19. SA	ND/C		L PACI			35 4 76 40			
Subsidence Control Closedhermal (Closed Loop) Cher (explain under #21 Remarks) Coher (explain						ft.						T METHOD
Geothermal (Closed Loop)	The second secon	J	030		710		#3 31110	a		rremi	nie	
Geothermal (Heating/Cooling Return)	T 197		20 DE		NCIO		ah additional	I -b4				
4. Date Well(s) Completed: 7/15/2021 Well ID# B10K 5a. Well Location: NCDENR Shingle Landing Facility/Owner Name Facility/O	2 00 00 00 00 00 00 00 00 00 00 00 00 00		FROM		то	G (atta	DESCRIPT	TON (co	olor, hard	ness, soil/1	rock type	, grain size, etc.)
Sa. Well Location: NCDENR Shingle Landing Facility/Owner Name 219 Arrow Head Ln Physical Address, City, and Zip Currituck County Parcel Identification No. (PIN) Sb. Latitude and longitude in degrees/minutes/seconds or decimal degrees: (if well field, one latilong is sufficient) 36.536716 N -76.175390 6. Is(are) the well(s): **DPermanent* or **Dremporary 7. Is this a repair to an existing well: **Dyes or **DNO If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form. 8. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells drilled: 9. Total well depth below land surface: 710 9. Total well depth below land surface: 710 9. Total well depth below top of casing: (ft.) (FOR WATER SUPPLY WELLS ONLY: Shingle Landing Facility ID# (if applicable) Fa	So school States Wall Reserve		0	ft.	10	ft.	Clay an	d sh	ell			
Shingle Landing Facility/Owner Name 219 Arrow Head Ln Physical Address, City, and Zip Currituck County Parcel Identification No. (PIN) Sh. Latitude and longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient) 36.536716 N -76.175390 6. Is(are) the well(s): Permanent or Temporary 7. Is this a repair to an existing well: Yes or No If this is a repair, fill out known well construction information and explain the nature of the repair under 81 remarks section or on the back of this form. 8. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same construction, only I GW-I is needed. Indicate TOTAL NUMBER of wells drilled: 9. Total well depth below land surface: 710 for multiple wells list all depth if different (example-3@200' and 2@100') 10. Static water level below top of casing: If water level is above casing, use "4." 11. Borehole diameter: 10 (in.) 12. Well construction method: Mud Rotary (ie. auger, rotary, cable, direct push, etc.) Shingle Landing Facility ID# (if applicable) 553 ft. 620 ft. Sandy silt with black sand 660 ft. 710 ft. Sand with small pebbles 22. Certification: 22. Certification: 36.536716 N -76.175390 W 6. Is(are) the well(s): Permanent or Temporary 22. Certification: 36.536716 N -76.175390 W 6. Is(are) the well(s): Permanent or Date of Contractor 22. Certification: 36.536716 N -76.175390 W 6. Is(are) the well(s): Permanent or Date of Contractor 22. Certification: 36.536716 N -76.175390 W 6. Is(are) the well(s): Sand with small pebbles 22. Certification: 36.536716 N -76.175390 W 6. Is(are) the well(s): Sand with small black sand (620 ft. 660 ft. Sandy with small pebbles 22. Certification: 36.536716 N -76.175390 W 6. Is(are) the well(s): Sand with small pebbles 22. Certification: 36.536716 N -76.175390 W 6. Is(are) the well(s): Sand with small pebbles 22. Certification: 36.536716 N -76.175390 W 6. Is(are) the well(s): Sand with small pebbles 22. Certification: 36.536716 N -76.17539	4. Date Well(s) Completed: 1/15/202	Well ID# BTUK	10	ft.	20	ft.	Sand				•	
Shingle Landing Facility/Owner Name 219 Arrow Head Ln Physical Address, City, and Zip Currituck County Parcel Identification No. (PIN) 5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient) 36.536716 N -76.175390 6. Is(are) the well(s): Permanent or Temporary 7. Is this a repair to an existing well: Seconds or decimal degrees: (if well field, one lat/long is sufficient) 8. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells drilled: 9. Total well depth below land surface: 710 For multiple wells list all depths if different (example-3@200" and 2@100") 10. Static water level below top of casing: If water level is above casing, use "±" 11. Borehole diameter: 10 (in.) Facility ID# (if applicable) Facility Id# (if ap	5a. Well Location:		20	ft.	220	ft.	Silt with	she	ll and	black	sand	<u> </u>
Facility/Owner Name 219 Arrow Head Ln Physical Address, City, and Zip Currituck County Parcel Identification No. (PIN) 5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient) 36.536716 N -76.175390 W 6. Is(are) the well(s): Permanent or Temporary 7. Is this a repair to an existing well: Yes or No (if this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form. 8. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells 6. Static water level below tand surface: 710 10. Static water level below top of casing: (if.) 11. Borehole diameter: 10 (in.) 12. Well construction method: Mud Rotary (i.e. auger, rotary, cable, direct push, etc.) FOR WATER SUPPLY WELLS ONLY: Sold with small pebbles 22. Certification: 23. Site diagram or additional well details: You may use the back of this page to provide additional well construction in dad 'See Over' in Remarks Box). You may also attach additional pages if necess driving this GW-1 within 30 days of well completion per the following: 24a. For All Wells: Original form to Division of Water Resources (DV Information Processing Unit, 1617 MSC, Raleigh, NC 27699-1636 24c. For Water Supply and Open-Loop Geothermal Return Wells: Copy to count environmental health department of the country where installed FOR WATER SUPPLY WELLS ONLY:	NCDENR	Shingle Landing	220	ft.		ft.						
219 Arrow Head Ln Physical Address, City, and Zip Currituck County Parcel Identification No. (PIN) 5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient) 36.536716 N -76.175390 6. Is(are) the well(s): Dermanent or Temporary 7. Is this a repair to an existing well: Ves or No if this is a repair, fill out known well construction information and explain the nature of the repair under fill remarks section or on the back of this form. 8. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells dirllled: 9. Total well depth below land surface: 710 (ft.) 10. Static water level below top of casing: (ft.) (ft.) 11. Borehole diameter: 10 (in.) 12. Well construction method: Mud Rotary (i.e. auger, rotary, cable, direct push, etc.) (fc.) FOR WATER SUPPLY WELLS ONLY: (620 ft. 660 ft. 710 ft. Sand with small pebbles 21. REMARKS 22. Certification: 23. Side diagram or additional well construction in accordance of this record has been provided to the well(s) was (were) constructed in accordance of this record has been provided to the well construction in accordance of this record has been provided to the well construction in accordance of this record has been provided to the well construction in accordance of this record has been provided to the well construction in accordance of this record has been provided to the well construction in accordance of this record has been provided to the well construction in accordance of this record has been provided to the well construction in accordance of this record has been provided to the well construction in accordance of this record has been provided to the well construction in accordance of t	Facility/Owner Name			ft.		ft.					nd	
Physical Address, City, and Zip Currituck County Parcel Identification No. (PIN) 5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lationg is sufficient) 36.536716 N -76.175390 W 6. Is(are) the well(s): Permanent or Temporary 7. Is this a repair to an existing well: Yes or No If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form. 8. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells drilled: 9. Total well depth below land surface: 710 (ft.) 10. Static water level below top of casing:	219 Arrow Head In	, and the second		ft.		ft.						F CCO\
County Parcel Identification No. (PIN) 5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient) 36.536716 N -76.175390 W 6. Is(are) the well(s): Dermanent or Temporary 7. Is this a repair to an existing well: Second or decimal degrees: (if this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form. 8. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells drilled: 9. Total well depth below land surface: 10. Static water level below top of casing: (ft.) 10. Static water level below top of casing: (ft.) 11. Borehole diameter: 10 (in.) 12. Well construction method: (ie. auger, rotary, cable, direct push, etc.) 12. REMARKS 21. REMARKS 22. Certification: 22. Certification: 22. Certification: 23. Singular is form. Thereby certify that the well(s) was (were) constructed in accordance of this record has been provided to the well owner. 23. Site diagram or additional well details: You may use the back of this page to provide additional well construction in dad 'Sec Ori in Remarks Box). You may also attach additional pages if necess when the following: 24. SUBMITTAL INSTRUCTIONS Submit this GW-1 within 30 days of well completion per the following: 24a. For All Wells: Original form to Division of Water Resources (DV Information Processing Unit, 1617 MSC, Raleigh, NC 27699-1636 24c. For Water Supply and Open-Loop Geothermal Return Wells: Copy to county environmental health department of the county where installed 24d. For Matter Supply and Open-Loop Geothermal Return Wells: Copy to county environmental health department of the county where installed 24d. For Water Wells producing over 100,000 GPD: Copy to DWR, CPCP 24d. For Water Wells producing over 100,000 GPD: Copy to DWR, CPCP 24d. For Water Wells producing over 100,000 GPD: Copy to DWR. CPCP		N N N N N N N N N N N N N N N N N N N	-									5-000)
Solution							Joanu w	iui Si	man p	epple	S	
5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient) 36.536716 N -76.175390 W 6. Is(are) the well(s): Permanent or Temporary 7. Is this a repair to an existing well: Yes or No If this is a repair, fill out known well construction information and explain the nature of the repair under #12 remarks section or on the back of this form. 8. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells drilled: 9. Total well depth below land surface: 710 (ft.) 10. Static water level below top of casing: If water level below top of casing: If water level is above casing, use "+" 11. Borehole diameter: 10 (in.) 12. Well construction method: Mud Rotary (ie. auger, rotary, cable, direct push, etc.) FOR WATER SUPPLY WELLS ONLY: 22. Certification: 23. Sie diagram or additional well construction Standards and that a of this record has been provided to the well owner. 23. Sie diagram or additional well details: You may use the back of this page to provide additional well construction in add 'See Over' in Remarks Box). You may also attach additional pages if necess and in the nature of the repair wells: Geopeter in Remarks Box). You may also attach additional pages if necess and in the nature of the repair wells: Geopeter in Remarks Box). You may also attach additional pages if necess and in Remarks Box. You may also attach additional pages if necess and in Remarks Box. You may also attach additional pages if necess and in Remarks Box. You may also attach additional pages if necess and in Remarks Box. You may also attach additional pages if necess and in Remarks Box. You may also attach additional pages if necess and in Remarks Box. You may also attach additional pages if necess and in Remarks Box. You may also attach additional pages if necess and in Re		Parcal Identification No. (DIN)										
22. Certification: 36.536716 N -76.175390 N -76.17640	2.52	1.5 (\$100.5) (1.60.5) \$1.50.5 (\$10.6) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$1.50.5) \$1.50.5 (\$					- Andrews - A					
36.536716 N -76.175390 W 6. Is(are) the well(s): Permanent or Temporary 7. Is this a repair to an existing well: Yes or No If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form. 8. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells drilled: You may use the back of this page to provide additional well construction in (add 'See Over' in Remarks Box). You may also attach additional pages if necess the back of this gage to provide additional pages if necess to this gage to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to this page to provide additional pages if necess to the well owner. 9. Total well depth below top of casing: (ft.) If the page to provide additional pages if necess to the well owner. 10. Static water level below top of casing: (ft.) Information Processing Unit, 1617 MSC, Raleigh, NC 27699-1617 24a. For All Wells: Copy to DWR, Underground Injection Control (Information Processing Unit, 1617 MSC, Raleigh, NC 27699-1636) 24c. For Water Wells producing over 100,000 GPD: Copy to DWR, CCPC Permit Program, 1611	(if well field, one lat/long is sufficient)	nutes/seconds or decimal degrees:	22.6									
6. Is(are) the well(s): Permanent or Temporary 7. Is this a repair to an existing well: Yes or No If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form. 8. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells drilled: 9. Total well depth below land surface: 710 9. Total well depth below land surface: 710 10. Static water level below top of casing: (ft.) 11. Borehole diameter: 10 (in.) 12. Well construction method: Mud Rotary (i.e. auger, rotary, cable, direct push, etc.) FOR WATER SUPPLY WELLS ONLY: Senature of Ceptified Well Contractor Date By signing this form, I hereby certify that the well(s) was (were) constructed in accordance of this form. I hereby certify that the well(s) was (were) constructed in accordance of this record has been provided to the well owner. 23. Site diagram or additional well details: You may use the back of this page to provide additional pages if necess drilled: You may use the back of this page to provide additional pages if necess drilled: You may use the back of this page to provide additional pages if necess drilled: You may use the back of this page to provide additional pages if necess drilled: You may use the back of this page to provide additional pages if necess drilled: You may use the back of this page to provide additional pages if necess drilled: You may use the back of this page to provide additional well construction in (add 'See Over' in Remarks Box). You may also attach additional pages if necess drilled: You may use the back of this page to provide additional well construction in (add 'See Over' in Remarks Box). You may also attach additional pages if necess drilled: You may use the back of this page to provide additional well construction for the full drilled: You may use the back of this page to provide additional well construction for the full drilled. You may use the ba		3 175390	22. Ce	rtitic	ation:							
7. Is this a repair to an existing well:	N 70	_W	61		11						10)- Co-21
7. Is this a repair to an existing well:	6. Is(are) the well(s): Permanent or	□Temporary	Signatur	e of c	epified	well Co	ontractor				Date	ON
1. Is this a repair to an existing well:			By signi	ng this	s form, I	hereby .	certify that the	e well(s	s) was (u	ere) cons	structed i	in accordance with
23. Site diagram or additional well details: 8. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells drilled: 9. Total well depth below land surface: For multiple wells list all depths if different (example-3@200' and 2@100') 10. Static water level below top of casing: If water level is above casing, use "+" 11. Borehole diameter: 10		Yes or No	15A NC	AC 02	C .0100	or 15A	NCAC 02C.	0200 V	Vell Con.	struction	Standar	ds and that a copy
8. For Geoprobe/DPT or Closed-Loop Geothermal Wells having the same construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells drilled: 9. Total well depth below land surface: For multiple wells list all depths if different (example- 3@200' and 2@100') 10. Static water level below top of casing: If water level is above casing, use "+" 11. Borehole diameter: 10 (in.) 12. Well construction method: (i.e. auger, rotary, cable, direct push, etc.) FOR WATER SUPPLY WELLS ONLY: You may use the back of this page to provide additional well construction in (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional well construction in (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages if necess (add 'See Over' in Remarks Box). You may also attach additional pages in proved (add 'See Over' in Remarks Box). You may also attach additional pages in proved (add 'See Over' in Remarks Box). Y	repair under #21 remarks section or on the back	of this form.										
construction, only 1 GW-1 is needed. Indicate TOTAL NUMBER of wells drilled:	8 For Geoprobe/DPT or Closed-Loop C	anthormal Walls having the same	You m	av us	gram or se the b	r addi t ack of	this page to	d etails o prov	i: zide ado	litional	well co	nstruction info
9. Total well depth below land surface: For multiple wells list all depths if different (example- 3@200' and 2@100') 10. Static water level below top of casing: If water level is above casing, use "+" 11. Borehole diameter: 10 (in.) 12. Well construction method: (i.e. auger, rotary, cable, direct push, etc.) (ift.) 12. WATER SUPPLY WELLS ONLY: 24. SUBMITTAL INSTRUCTIONS Submit this GW-1 within 30 days of well completion per the following: (ft.) 14. Submit this GW-1 within 30 days of well completion per the following: (ft.) 15. Submit this GW-1 within 30 days of well completion per the following: (ft.) 16. Submit this GW-1 within 30 days of well completion per the following: (ft.) 16. Submit this GW-1 within 30 days of well completion per the following: (ft.) 16. For All Wells: Original form to Division of Water Resources (DW Information Processing Unit, 1617 MSC, Raleigh, NC 27699-1617 24b. For Injection Wells: Copy to DWR, Underground Injection Control (Information Program, 1636 MSC, Raleigh, NC 27699-1636 24c. For Water Supply and Open-Loop Geothermal Return Wells: Copy to County environmental health department of the county where installed 24d. For Water Wells producing over 100,000 GPD: Copy to DWR, CCPO	construction, only 1 GW-1 is needed. India	cate TOTAL NUMBER of wells	(add 'S	ee Ov	er' in R	emarks	Box). You	may a	lso atta	ch additi	ional pa	ges if necessary.
9. Total well depth below land surface: For multiple wells list all depths if different (example- 3@200' and 2@100') 10. Static water level below top of casing: If water level is above casing, use "+" 11. Borehole diameter: 10 (in.) 12. Well construction method: Mud Rotary (i.e. auger, rotary, cable, direct push, etc.) FOR WATER SUPPLY WELLS ONLY: (ft.) Submit this GW-1 within 30 days of well completion per the following: Submit this GW-1 within 30 days of well completion per the following: (ft.) Submit this GW-1 within 30 days of well completion per the following: (ft.) Submit this GW-1 within 30 days of well completion per the following: (ft.) Submit this GW-1 within 30 days of well completion per the following: (ft.) Submit this GW-1 within 30 days of well completion per the following: (ft.) Submit this GW-1 within 30 days of well completion per the following: (ft.) Submit this GW-1 within 30 days of well completion per the following: (ft.) Submit this GW-1 within 30 days of well completion per the following: (ft.) Submit this GW-1 within 30 days of well completion per the following: (ft.) Submit this GW-1 within 30 days of well completion per the following: (ft.) Submit this GW-1 within 30 days of well completion per the following: (ft.) Submit this GW-1 within 30 days of well completion per the following: (ft.) Submit this GW-1 within 30 days of well completion for the following: (ft.) Submit this GW-1 within 30 days of well completion for the following: (ft.) Submit this GW-1 within 40			24. SU	BMI	TTAL 1	INSTE	RUCTIONS	3				
10. Static water level below top of casing: If water level is above casing, use "+" 11. Borehole diameter: 10 (in.) 12. Well construction method: (i.e. auger, rotary, cable, direct push, etc.) 12. WATER SUPPLY WELLS ONLY: 13. Static water level below top of casing: Information Processing Unit, 1617 MSC, Raleigh, NC 27699-1617 24b. For Injection Wells: Copy to DWR, Underground Injection Control (I Program, 1636 MSC, Raleigh, NC 27699-1636 24c. For Water Supply and Open-Loop Geothermal Return Wells: Copy to county environmental health department of the county where installed 24d. For Water Wells producing over 100,000 GPD: Copy to DWR, CCPC Permit Program, 1611 MSC, Raleigh NC 27699-1611	9. Total well depth below land surface:	710 _(ft.)			***************************************							
Information Processing Unit, 1617 MSC, Raleigh, NC 27699-1617 11. Borehole diameter: 10 (in.) 12. Well construction method: Mud Rotary (i.e. auger, rotary, cable, direct push, etc.) 12. Well construction method: Mud Rotary (i.e. auger, rotary, cable, direct push, etc.) 12. Well construction method: Mud Rotary (i.e. auger, rotary, cable, direct push, etc.) 13. Borehole diameter: 10 (in.) Program, 1636 MSC, Raleigh, NC 27699-1636 24c. For Water Supply and Open-Loop Geothermal Return Wells: Copy to county environmental health department of the county where installed (in.) Program, 1611 MSC, Raleigh, NC 27699-1611	For multiple wells list all depths if different (exam	nple- 3@200' and 2@100')	Submi	t this	GW-1	withir	1 30 days of	f well	comple	tion per	the fol	llowing:
11. Borehole diameter: 10 (in.) 12. Well construction method: Mud Rotary (i.e. auger, rotary, cable, direct push, etc.) 12. WeLLS ONLY: 13. Borehole diameter: 10 (in.) 14b. For Injection Wells: Copy to DWR, Underground Injection Control (I Program, 1636 MSC, Raleigh, NC 27699-1636 24c. For Water Supply and Open-Loop Geothermal Return Wells: Copy to county environmental health department of the county where installed 24d. For Water Wells producing over 100,000 GPD: Copy to DWR, CCPC Permit Program, 1611 MSC, Raleigh, NC 27699-1611	10. Static water level below top of casing	• (ft)	24a. <u>F</u>	or A	II Wel	ls: Or	iginal form	to D	ivision	of Wa	ter Res	sources (DWR),
12. Well construction method: Mud Rotary (i.e. auger, rotary, cable, direct push, etc.) 12. Well construction method: Mud Rotary (i.e. auger, rotary, cable, direct push, etc.) 24c. For Water Supply and Open-Loop Geothermal Return Wells: Copy to county environmental health department of the county where installed 24d. For Water Wells producing over 100,000 GPD: Copy to DWR, CCPC Permit Program, 1611 MSC, Raleigh NC 27699-1611		·(it.)	Inform	ation	Process	sing U	nit, 1617 MS	SC, Ra	aleigh, l	NC 2769	99-1617	
12. Well construction method: Mud Rotary (i.e. auger, rotary, cable, direct push, etc.) 12. Well construction method: Mud Rotary (i.e. auger, rotary, cable, direct push, etc.) 24c. For Water Supply and Open-Loop Geothermal Return Wells: Copy to county environmental health department of the county where installed 24d. For Water Wells producing over 100,000 GPD: Copy to DWR, CCPC Permit Program, 1611 MSC, Raleigh NC 27699-1611	11. Borehole diameter: 10	(in.)	24b. <u>F</u>	or In	jection	Wells	: Copy to I	OWR,	Underg	ground I	Injection	n Control (IUC)
FOR WATER SUPPLY WELLS ONLY: 24d. For Water Wells producing over 100,000 GPD: Copy to DWR, CCPC Permit Program, 1611 MSC, Raleigh NC 27699-1611	Mud		Prograi	n, 16	36 MS(C, Rale	eigh, NC 276	699-16	536			
FOR WATER SUPPLY WELLS ONLY: 24d. For Water Wells producing over 100,000 GPD: Copy to DWR, CCPC Permit Program, 1611 MSC, Raleigh NC 27699-1611	(i.e. auger, rotary, cable, direct push etc.)	. Cotal y	24c. <u>Fo</u>	or Wa	ater Suj	pply a	nd Open-Le	oop G	eother	mal Ret	urn We	ells: Copy to the
Permit Program, 1611 MSC, Raleigh NC 27699-1611	year-10-10-10-10-10-10-10-10-10-10-10-10-10-		county	envir	onment	al heal	ith departme	ent of	the cou	nty when	re instal	lled
Permit Program, 1611 MSC, Raleigh, NC 27699-1611	FOR WATER SUPPLY WELLS ONLY	:	24d. F	or W	ater W	ells pr	oducing ov	er 100	0,000 G	PD: Co	py to I	OWR, CCPCUA
	13a. Yield (gpm) N	Method of test:	Permit	Progr	ram, 16	11 MS	C, Raleigh,	NC 2	/699-16	11		
13b. Disinfection type: Amount:	13h. Disinfection type:	A mount										

WELL CONSTRUCTION RECORD (GW-1)



Form GW-1 Well Construction Electronic Form North Carolina Department of Environmental Quality Division of Water Resources November 18, 2021

5. Well Location

Submission ID# GW1-2022-03739 O Yes Are you submitting a scanned form?* No **CONTACT INFORMATION** Email Address* Contact Name* CHARLES DOZIER, II "BO" DebHenderson1020@aol.com Is this a revision to the form you have previously submitted?* ○ Yes

No WELL CONSTRUCTION INFORMATION 1. Who is installing these wells?* Owner Well Contractor 1. Well Contractor Information: Certiticate # Cert Level First Name **Last Name Company Name** 4088 CHARLES DOZIER, II TOANO WELL AND PUMP SERVICE, INC. 2. Well Construction Permit #: List all applicable well construction permits (i.e. Monitoring Wells, UIC, County, CCPCUA, etc.) What type of well is this?* Injection Well Non-Water Supply Well Water Supply Well (includes irrigation wells) Monitoring 3. Non-Water Supply Well* Recovery 4. Date well was completed and ID# Date Well Completed* Well ID# **Well Yield** 3/8/2022 MAPLE #2 (gallons per minute)"

Facility/Owner Nar	ne *		Facility ID#		
CURRITUCK COUN	NTY		MAPLE #2		
(Required)			(If applicable)		
County*			Parcel Identification	on No. (PIN)	
Currituck					
Physical Address	Street Add	ress			
	AIRPOR ⁻	T ROAD			
	Address Li	ne 2			
	AVATION	I PARKWAY			
	City		State /	Province / Region	
	MAPLE		NORT	TH CAROLINA	
	Postal / Zip	o Code	Countr	у	
	27956		UNITE	ED STATES	
Latitude * 36.3954			Longitude *-75.999	8000000 al degrees	
Decima	ll degrees		Decima	al degrees	
C I=(===) 4h======II/=	\.*				
6. Is(are) the well(s	s): Perma	anent O Temporary			
7. Is this a repair to	an existing we	II: [★] ○ Yes ● No			
				tion information and explain the nature of the	
		repair under #21 re	emarks section or on the b	DACK OF THIS FORM.	
For multiple Geop	robe/DPT or Clos	sed-Loop Geothermal W	Vells having the sam	e construction, only 1 GW-1 is needed.	
				, , , , , , , , , , , , , , , , , , , ,	
8a. Indicate TOTAL	. NUMBER of we	ells drilled: 1			
9. Total well depth			9a. What is the de	oth of the casing from ground	
9. Total well depth	below land surfa	ace: (ft.)	9a. What is the dep	oth of the casing from ground	
9. Total well depth	below land surfa	ace: (ft.)		oth of the casing from ground	
9. Total well depth 30 For multiple wells list	below land surfa	ace: (ft.)	surface? in feet		
9. Total well depth 30 For multiple wells list	below land surfa all depths if different d 2@100')	ace: (ft.)	surface? in feet 11. Borehole diame		
9. Total well depth 30 For multiple wells list (example- 3@200' an	below land surfa	ace: (ft.)	surface? in feet		
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level is above	below land surfa	ace: (ft.)	surface? in feet 11. Borehole diame		
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level is above 12. Well construction	below land surfa	ace: (ft.)	surface? in feet 11. Borehole diame	eter:	
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level is above 12. Well construction Auger	below land surfa	ace: (ft.) casing: (ft.)	in feet 11. Borehole diame 10 in inches	eter: Cable Tool	
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level water level is above 12. Well construction Auger Direct Push	below land surfa	ace: (ft.)	in feet 11. Borehole diame 10 in inches	eter:	
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level is above 12. Well construction Auger	below land surfa	ace: (ft.) casing: (ft.)	in feet 11. Borehole diame 10 in inches	eter: Cable Tool	
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level is above 12. Well construction Auger Direct Push Other	below land surfa	ace: (ft.) casing: (ft.)	in feet 11. Borehole diame 10 in inches	eter: Cable Tool	
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water levels water levels above 12. Well construction Auger Direct Push Other	below land surfa	ace: (ft.) casing: (ft.)	in feet 11. Borehole diame 10 in inches	eter: Cable Tool	
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level water level is above 12. Well construction Auger Direct Push Other	below land surfa	ace: (ft.) casing: (ft.)	in feet 11. Borehole diame 10 in inches	eter: Cable Tool	
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level is above 12. Well construction Auger Direct Push Other 14. WATER BEARIE From	below land surfa all depths if different d 2@100') vel below top of o casing, use "+" on method: NG/FRACTURE 2 To	ace: (ft.) casing: (ft.)	in feet 11. Borehole diame 10 in inches	eter: Cable Tool	
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level is above 12. Well construction Auger Direct Push Other 14. WATER BEARING	below land surfa	ace: (ft.) casing: (ft.) Air Rotary Mud Rotary ZONES Description	in feet 11. Borehole diame 10 in inches	eter: Cable Tool	
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level is above 12. Well construction Auger Direct Push Other 14. WATER BEARING	below land surfa all depths if different d 2@100') rel below top of e casing, use "+" fon method: NG/FRACTURE 2 To 25 in feet	casing: (ft.) Air Rotary Mud Rotary ZONES Description GRAY SAND AND SH	surface? in feet 11. Borehole diame 10 in inches	eter: Cable Tool	
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level is above 12. Well construction Auger Direct Push Other 14. WATER BEARING	below land surfa all depths if different d 2@100') rel below top of e casing, use "+" fon method: NG/FRACTURE 2 To 25 in feet	ace: (ft.) casing: (ft.) Air Rotary Mud Rotary ZONES Description	surface? in feet 11. Borehole diame 10 in inches	eter: Cable Tool	
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level is above 12. Well construction Auger Direct Push Other 14. WATER BEARING	below land surfa all depths if different d 2@100') rel below top of e casing, use "+" fon method: NG/FRACTURE 2 To 25 in feet	casing: (ft.) Air Rotary Mud Rotary ZONES Description GRAY SAND AND SH	surface? in feet 11. Borehole diame 10 in inches	eter: Cable Tool	
9. Total well depth 30 For multiple wells list (example- 3@200' an 10. Static water level is above 12. Well construction Auger Direct Push Other 14. WATER BEARIE From 15 in feet	below land surfa all depths if different d 2@100') vel below top of o casing, use "+" on method: NG/FRACTURE 2 To 25 in feet	casing: (ft.) Air Rotary Mud Rotary Mud Rotary ZONES Description GRAY SAND AND SH	surface? in feet 11. Borehole diame 10 in inches	eter: Cable Tool Rotosonic	

17. SCREEN

From	То	Diameter	Thickness	Material
15.00 in feet	25.00 in feet	4.00 in inches	.020	SCH 40 STAINLESS STEEL

18. GROUT

From	То	Material	Emplacment Method & Amount
10.00 in feet	0.00 in feet	BENTONITE	PUMPED FROM BOTTOM TO TOP WITH TRIMMIE PIPE

19. SAND/GRAVEL PACK (if applicable)

From	То	Material	Emplacment Method
30.00 in feet	10.00 in feet	SILICIA #3	PUMPED FROM BOTTOM TO TOP WITH TRIMMIE PIPE

20. DRILLING LOG

From	То	Description (color, hardness, soil/rock type, grain size, etc.)
0.00 in feet	20.00 in feet	TAN SAND
20.00 in feet	30.00 in feet	GRAY SAND/SHELL MIX

21. Remarks

22. Site diagram or additional well details:

You may upload additional well construction information here. pdf only

CERTIFICATION INFORMATION

* By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Certification

CHOARASS II. DOZIER, III

Signature of Certified Well Contractor

WELL CONSTRUCTION RECORD (GW-1)



Form GW-1 Well Construction Electronic Form North Carolina Department of Environmental Quality Division of Water Resources November 18, 2021

5. Well Location

Submission ID# GW1-2022-03740 O Yes Are you submitting a scanned form?* No **CONTACT INFORMATION** Email Address* Contact Name* CHARLES N. DOZIER, II DebHenderson1020@aol.com Is this a revision to the form you have previously submitted?* ○ Yes

No WELL CONSTRUCTION INFORMATION 1. Who is installing these wells?* Owner Well Contractor 1. Well Contractor Information: Certiticate # Cert Level First Name **Last Name Company Name** 4088 CHARLES DOZIER, II TOANO WELL AND PUMP SERVICE, INC. 2. Well Construction Permit #: List all applicable well construction permits (i.e. Monitoring Wells, UIC, County, CCPCUA, etc.) What type of well is this?* Injection Well Non-Water Supply Well Water Supply Well (includes irrigation wells) Monitoring 3. Non-Water Supply Well* Recovery 4. Date well was completed and ID# Date Well Completed* Well ID# **Well Yield** 3/8/2022 MAPLE #1 (gallons per minute)"

Facility/Owner Nar	ne *		Facility ID#		
CURRITUCK COU	NTY		MAPLE #1		
(Required)			(If applicable)		
County*			Parcel Identification	on No. (PIN)	
Currituck					
Physical Address	* Street Ad	ldress			
1 Hysical Addicss		RT ROAD			
	Address				
	AVATIO	N PARKWAY			
	City		State /	Province / Region	
	MAPLE		NORT	TH CAROLINA	
	Postal / Z	Zip Code	Countr	v	
	27956		United	d States	
Latitude * 36.3954			Longitude *-75.999		
Decima	al degrees		Decima	al degrees	
6. Is(are) the well(s	s):* Perm	nanent O Temporary			
7. Is this a repair to	o an existing w				
			fill out known well construction remarks section or on the base of the section of the base of the base of the section of the base of the b	tion information and explain the nature of the	
For multiple Geop	robe/DPT or Clo	osed-Loop Geothermal	Wells having the sam	e construction, only 1 GW-1 is needed.	
On Indiana TOTAL	NUMBER of or		4		
8a. Indicate TOTAL	NUMBER of w	vells drilled:	1		
			1		
9. Total well depth			9a. What is the de	pth of the casing from ground	
	below land sur	face: (ft.)		pth of the casing from ground	
9. Total well depth	below land sur	face: (ft.)	9a. What is the de	pth of the casing from ground	
9. Total well depth 760 For multiple wells list	below land sur	face: (ft.)	9a. What is the de surface?		
9. Total well depth 760 For multiple wells list	below land sur all depths if different d 2@100')	face: (ft.)	9a. What is the desurface?		
9. Total well depth 760 For multiple wells list (example- 3@200' an	below land sur all depths if different d 2@100')	face: (ft.)	9a. What is the desurface? in feet 11. Borehole diam		
9. Total well depth 760 For multiple wells list (example- 3@200' ar	below land sur all depths if different d 2@100') vel below top of e casing, use "+"	face: (ft.)	9a. What is the desurface? in feet 11. Borehole diam		
9. Total well depth 760 For multiple wells list (example- 3@200' ar 10. Static water level is above 12. Well construct	below land sur all depths if different d 2@100') vel below top of e casing, use "+"	face: (ft.) nt f casing: (ft.)	9a. What is the desurface?in feet11. Borehole diam10in inches	eter:	
9. Total well depth 760 For multiple wells list (example- 3@200' ar 10. Static water level is above 12. Well construction Auger	below land sur all depths if different d 2@100') vel below top of e casing, use "+"	face: (ft.) nt f casing: (ft.)	9a. What is the desurface? in feet 11. Borehole diam 10 in inches	eter: Cable Tool	
9. Total well depth 760 For multiple wells list (example- 3@200' ar 10. Static water level is above 12. Well construct	below land sur all depths if different d 2@100') vel below top of e casing, use "+"	face: (ft.) nt f casing: (ft.)	9a. What is the desurface? in feet 11. Borehole diam 10 in inches	eter:	
9. Total well depth 760 For multiple wells list (example- 3@200' ar 10. Static water level is above 12. Well construct Auger Direct Push	below land sur all depths if different d 2@100') vel below top of e casing, use "+"	face: (ft.) nt f casing: (ft.)	9a. What is the desurface? in feet 11. Borehole diam 10 in inches	eter: Cable Tool	
9. Total well depth 760 For multiple wells list (example- 3@200' ar 10. Static water level is above 12. Well construct Auger Direct Push	below land sur all depths if different d 2@100') vel below top of e casing, use "+" ion method:	face: (ft.) f casing: (ft.) Air Rotar Mud Rota	9a. What is the desurface? in feet 11. Borehole diam 10 in inches	eter: Cable Tool	
9. Total well depth 760 For multiple wells list (example- 3@200' ar 10. Static water level is above 12. Well construct Auger Direct Push Other 14. WATER BEARI	below land sur all depths if different d 2@100') vel below top of e casing, use "+" ion method:	face: (ft.) f casing: (ft.) Air Rotar Mud Rota	9a. What is the desurface? in feet 11. Borehole diam 10 in inches	eter: Cable Tool	
9. Total well depth 760 For multiple wells list (example- 3@200' ar 10. Static water level is above 12. Well construct Auger Direct Push Other 14. WATER BEARI	below land sur all depths if different d 2@100') vel below top of e casing, use "+" ion method:	face: (ft.) f casing: (ft.) Air Rotar Mud Rota	9a. What is the desurface? in feet 11. Borehole diam 10 in inches	eter: Cable Tool	
9. Total well depth 760 For multiple wells list (example- 3@200' ar 10. Static water level is above 12. Well construct Auger Direct Push Other 14. WATER BEARI	below land sur all depths if different d 2@100') vel below top of e casing, use "+" ion method: NG/FRACTURE	face: (ft.) f casing: (ft.) Air Rotar Mud Rota ZONES Description	9a. What is the desurface? in feet 11. Borehole diam 10 in inches	eter: Cable Tool	
9. Total well depth 760 For multiple wells list (example- 3@200' ar 10. Static water level is above 12. Well construct Auger Direct Push Other 14. WATER BEARI From 730	below land sur all depths if different d 2@100') vel below top of e casing, use "+" ion method: NG/FRACTURE To 750	face: (ft.) f casing: (ft.) Air Rotar Mud Rota ZONES Description	9a. What is the desurface? in feet 11. Borehole diam 10 in inches	eter: Cable Tool	
9. Total well depth 760 For multiple wells list (example- 3@200' ar 10. Static water level is above 12. Well construct Auger Direct Push Other 14. WATER BEARI From 730 in feet	below land sur all depths if different d 2@100') vel below top of e casing, use "+" ion method: NG/FRACTURE To 750 in feet	face: (ft.) f casing: (ft.) Air Rotar Mud Rota ZONES Description	9a. What is the desurface? in feet 11. Borehole diam 10 in inches	eter: Cable Tool	
9. Total well depth 760 For multiple wells list (example- 3@200' ar 10. Static water level is above 12. Well construct Auger Direct Push Other 14. WATER BEARI From 730 in feet	below land sur all depths if different d 2@100') vel below top of e casing, use "+" ion method: NG/FRACTURE To 750 in feet	face: (ft.) f casing: (ft.) Air Rotar Mud Rota ZONES Description SHELLS AND LIME	9a. What is the desurface? in feet 11. Borehole diam 10 in inches	eter: Cable Tool	
9. Total well depth 760 For multiple wells list (example- 3@200' ar 10. Static water level is above 12. Well construct Auger Direct Push Other 14. WATER BEARI From 730 in feet	below land sur all depths if different d 2@100') vel below top of e casing, use "+" ion method: NG/FRACTURE To 750 in feet	face: (ft.) f casing: (ft.) Air Rotar Mud Rota ZONES Description SHELLS AND LIME	9a. What is the desurface? in feet 11. Borehole diam 10 in inches y ary	eter: Cable Tool Rotosonic	

17. SCREEN

From	То	Diameter	Thickness	Material
730.00 in feet	750.00 in feet	4.00 in inches	.020	SCH 40 STAINLESS STEEL

18. GROUT

From	То	Material	Emplacment Method & Amount
720.00	0.00	BENTONITE	PUMPED FROM BOTTOM TO TOP WITH TRIMMIE
in feet	in feet		PIPE

19. SAND/GRAVEL PACK (if applicable)

From	То	Material	Emplacment Method
760.00 in feet	720.00 in feet	SILICIA #3	PUMPED FROM BOTTOM TO TOP WITH TRIMMIE PIPE

20. DRILLING LOG

From	То	Description (color, hardness, soil/rock type, grain size, etc.)
0.00 in feet	20.00 in feet	TAN SAND
20.00 in feet	40.00 in feet	GRAY SAND/SHELL MIX
40.00 in feet	60.00 in feet	SAND AND SHELL MIX
60.00 in feet	80.00 in feet	GRAY/BLUE CLAY
80.00 in feet	120.00 in feet	BLUE CLAY
120.00 in feet	140.00 in feet	BLUE CLAY WITH SHELLS
140.00 in feet	160.00 in feet	WHITE SHELLS
160.00 in feet	180.00 in feet	WHITE SHELL AND CLAY MIX
180.00 in feet	240.00 in feet	ORANGE/TAN SAND WITH SHELLS
240.00 in feet	260.00 in feet	BROWN/TAN SAND, SHELL WITH BROWN CLAY MIX
260.00 in feet	280.00 in feet	BROWN CLAY AND SHELL MIX
280.00 in feet	300.00 in feet	GRAY CLAY AND SHELL MIX
300.00 in feet	320.00 in feet	BLUE CLAY AND SHELL MIX
320.00 in feet	730.00 in feet	STICKY BLUE CLAY

730.00 in feet	740.00 in feet	CLAY/SHELL MIX WITH BLACK SAND
740.00 in feet	750.00 in feet	LIMESTONE
750.00 in feet	760.00 in feet	WHITE CLAY
in feet	in feet	
in feet	in feet	

21. Remarks

22. Site diagram or additional well details:

You may upload additional well construction information here. pdf only

CERTIFICATION INFORMATION

* By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Certification

CHARLES N. DOZIER, FI

Signature of Certified Well Contractor

Appendix D DATA MANAGEMENT PLAN

NC DWR Data Management Plan

Effective: January 1, 2022

Project: All DWR Operations and DWR-USGS Cooperative Agreements

for the National Ground-Water Monitoring Network (NGWMN)

Contacts: <u>USGS</u>

Daryll Pope, Tel (804) 261-2630/(609) 462-7119, dpope@usgs.gov

Candice Hopkins, Tel (208) 387-1331, chopkins@usgs.gov

NC DWR

Mark Durway, (919) 707-9018, mark.durway@ncdenr.gov

Susan Laughinghouse, (252) 229-3349, susan.laughinghouse@ncdenr.gov

Budget: State and USGS Funding Sources

Types of Data Collected

Four data types are routinely collected by the NC DWR Groundwater Management Branch (GWMB). These data types consist of groundwater levels, groundwater quality analyses, well drilling data, and locational data. Currently, NC DWR provides persistent data to the NGWMN from over 600 wells. Nine USGS Principal Aquifers located in the North Carolina coastal plain, piedmont, and mountains are monitored by these wells.

Groundwater levels will be acquired hourly or at other regular intervals, validated, and downloaded to the appropriate NC DWR database. Water quality data will be collected at less frequent intervals and will consist primarily of chloride concentrations from discrete depth intervals within the aquifer.

Drilling data consisting of lithology, geophysical logs, and well construction specifications will be acquired during the drilling and well completion process. Lithology will be determined from rock cuttings collected at 10 ft intervals during well drilling. Lithologic data and well specifications including total depth, casing and screen dimensions, and other information will be used to produce a drilling log once the well has been completed. The geology of the well will be further evaluated after the well has been drilled to total depth using open-hole geophysical logging techniques. The geophysical data will be used to produce the following geophysical logs: gamma, spontaneous potential (SP), single-point resistivity (SPR), 16" normal resistivity, 64" normal resistivity. Lithologic descriptions, geophysical logging, drilling, and well completion will be overseen by a geologist and drilling will be performed by a certified well contractor in accordance with state requirements.

Accuracy of locational data will be accomplished using survey grade GPS equipment to determine latitude, longitude, and altitude. Accuracy and geodetic reference systems used by NC DWR are state plane coordinates and latitude/longitude (<0.05 ft), altitude (<0.1 ft), horizontal datum (NAD83), and altitude datum (NAVD88).

Data and Metadata Standards

NC DWR stores data in the following databases:

<u>Data Type</u> <u>Database Tables</u>

Groundwater Levels gwb.dwr, gwb.dwrwatlev, gwb.dwrwatlevhourly

Groundwater Quality gwb.dwrchloride

Well Logs gwb.logs, gwb.logdata, gwb.resstafr

Location, Latitude/Longitude, Altitude gwb.dwr

The NC DWR groundwater monitoring network uses the MariaDB database management platform. This platform is supported by branch and division level IT staff. The NC DWR Groundwater Monitoring Branch website is hosted by Apache web server. Internal database tables are used to maintain database quality control and allow for editing. Water level data meeting standards are unloaded to public tables listed above.

Policies for Access and Sharing

Project data collected will be available through the NGWMN Data Portal without restriction.

Policies and Provisions for Re-Use and Re-Distribution

There will be restriction on the use of the data through the portal. Any data obtained through the portal and redistributed is expected to cite the original source of the data as NC DWR through this USGS/NGWMN Cooperative.

Plans for Archiving and Preservation of Access

Paper copies of field data will be scanned and stored by NC DWR and will be included in regular system backups. This data and all databases will be backed up at least weekly.

<u>Project Personnel and Qualifications</u>

GWMB staff oversee project management, supervision and administration, procurement, data collection and analysis, and reporting. Project staff and their qualifications are:

Mark Durway, PG, NC DWR GWMB Hydrogeologist Susan Laughinghouse, PG, NC DWR GWMB Monitoring Unit Head Kevin McVerry, NC DWR GWMB Environmental Specialist Nathaniel C. Wilson, PG (Retired/Consultant), Former Head, NC DWR GWMB Mark Durway is a licensed geologist in NC and Louisiana and has BS and MS degrees in geology from Guilford College and NCSU. He has oil and gas experience with Core Laboratories and Halliburton, regulatory and resource management experience with the NC Superfund Program, Petroleum UST Program and Division of Water Resources, and private sector experience as an environmental consultant. His current position as GWMB hydrogeologist includes all aspects of data review and interpretation, groundwater use and availability studies, drilling oversight, grant and contract procurement, and reporting.

Susan Laughinghouse is a licensed geologist in NC and has BS degree in geology from East Carolina University. She has regulatory and resource management experience with the NC Division of Water Resources, and private sector experience as an environmental consultant. Her current position as GWMB Monitoring Unit Head includes all aspects of operation and maintenance of the state well network, data collection and entry, well procurement and drilling contracts, access agreements and reporting, and staff supervision.

Kevin McVerry is an Environmental Specialist with a BA in geology from NCSU. He has regulatory and resource management experience with the NC Division of Water Resources and the NC Division of Coastal Management, and private sector experience as an environmental consultant. His current position as GWMB geologist/hydrogeologic field technician involves all aspects of well network maintenance and data collection and serving as team leader on special projects.

Nat Wilson, PG, is a licensed geologist and has BS and MS degrees in geology from Middlebury College and University of Oregon. His qualifications include a combination of education, licensing, and experience in the fields of geology, hydrology, computer programming, and data analysis. He served as GWMB Branch Head for 20 years during which time he created the existing map interface, website, and numerous applications and tables which define the state Groundwater Management Branch. He has over 20 years of experience developing complex groundwater database programs and websites. He retired from DWR in December 2020 after a total of 34 years with the state and currently works as an independent consultant.

Appendix E NGWMN GRANT AWARD

I. DATE ISSUED	וויוויוויוויוויוויוויוויוויוויוויוויווי	Id. SUPERS	EDES AWARD NO	11CE dated 04/26/2021
11/09/2021			t any additions or re effect unless specifi	estrictions previously imposed cally rescinded
2. CFDA NO.				
15.980 - National (Fround-Water M	onitoring Netw	ork/	
3. ASSISTANCE TYP	E Cooperative	Agreement		
4. GRANT NO. G19A	C00193-02		5. TYPE OF AW	ARD
Originating MCA #			Research	
4a. FAIN G19AC001	93		5a. ACTION TYP	E Post Award Amendment
6. PROJECT PERIO	D MM/DD	/YYYY		MM/DD/YYYY
From	07/15/2	019	Through	05/14/2022
7. BUDGET PERIOD	MM/DE	/YYYY		MM/DD/YYYY
From	07/15/20	019	Through	05/14/2022

NOTICE OF AWARD



AUTHORIZATION (Legislation/Regulations)

Public Law 111-11, Subtitle F—Secure Water: Section 9507 Water Data Enhancement by the United States Geological Survey

8. TITLE OF PROJECT (OR PROGRAM)

Installation of monitoring stations within the Albemarle - Tidewater area along the NC/VA border

	NTEE NAME AND ADDRESS			01 004117				
	NTEE NAME AND ADDRE				EE PROJECT DIRECTOR			
North Carolina Department Of Environmental Quality				D. Mark Durway				
1612 Mail Service Ctr					Mail Service Center			
	rth Carolina Department of	Environmental Quality			Resources			
Ra	leigh, NC 27699-1600			_	h, NC 27699-1611			
				Phone	: 919-707-9018			
10a. GR	ANTEE AUTHORIZING O	FICIAL		10b. FEDEF	RAL PROJECT OFFICER			
Ju	ulia Gore			Mr. Da	aryll Pope			
21	7 W Jones St Ste 5103			1730 E	East Parham Road			
DIV	ISION OF ENVIR HLTH			USGS				
Ra	leigh, NC 27603-6100			Richm	ond, VA 23228			
	(0.10) 707 0000			Phone	e: 804-261-2630			
			ALL AMOUNTS ARE S	SHOWN IN U	SD			
11. APPI	ROVED BUDGET (Exclude:	s Direct Assistance)		12. AWARD	COMPUTATION			
I Finan	cial Assistance from the Fed	deral Awarding Agency Only	<u>.</u>	a. Amount o	of Federal Financial Assistance (from	item 11m) \$		234,153.00
II Total	project costs including gran	t funds and all other financial par	ticipation	b. Less Unobligated Balance From Prior Budget Periods \$ 0.00				
a.	Salaries and Wages	\$	0.00	c. Less Cumulative Prior Award(s) This Budget Period \$ 234,153.00				
	· ·			d. AMOUNT OF FINANCIAL ASSISTANCE THIS ACTION S				
b.	Fringe Benefits	\$	0.00	13. Total Federal Funds Awarded to Date for Project Period \$ 234,153.00				
c.					MENDED FUTURE SUPPORT			
d.	Equipment	\$	0.00	(Subject to the availability of funds and satisfactory progress of the project):				
e.	Supplies	\$	0.00	YEAR	TOTAL DIRECT COSTS	YEAR		L DIRECT COSTS
	T	\$	0.00	a.	\$	d.	\$	
1.	Travel	Φ	0.00	b.	\$	e.	\$	
g.	Construction	\$	0.00	C.	\$	f.	\$	
h.	Other	\$	234,153.00	15. PROGRAM ALTERNATIVE	INCOME SHALL BE USED IN ACCORD WITH (ONE OF THE FOLLOW	ING	
i.	Contractual	\$	0.00	b. ADDITIONAL COSTS				
j.	TOTAL DIRECT COS	TS	\$ 234,153.00	c. d. e.	MATCHING OTHER RESEARCH (Add / Deduct Option) OTHER (See REMARKS)			Ш
k.	INDIRECT COSTS		\$ 0.00		RD IS BASED ON AN APPLICATION SUBMITTE	D TO AND AS ADDDO	WED DY THE E	EDERAL AWARDING ACENCY
				ON THE ABOVE	TITLED PROJECT AND IS SUBJECT TO THE TE NCE IN THE FOLLOWING:			
I.	TOTAL APPROVED BUD	GET	\$ 234,153.00	a.	The grant program legislation			
				b. c.	The grant program regulations. This award notice including terms and conditions	s, if any, noted below und	der REMARKS.	
m.	Federal Share	\$	234,153.00	d.	Federal administrative requirements, cost princip ere are conflicting or otherwise inconsistent p			•
n.	Non-Federal Share	\$	0.00	prevail. Accep	are are conflicting or otherwise inconsistent partance of the grant terms and conditions is actified grant payment system.			
REI	MARKS (Other Terms ar	d Conditions Attached -	• Yes) No)				

GRANTS MANAGEMENT OFFICIAL:

Faith Graves, Grants Management Specialist National Center 12201 Sunrise Valley Drive

Reston, VA 20192 Phone: 703-648-7356

See next page

17. VENDOR CODE 0070066320		18. DUNS 809785280			19. CONG. DIST. 02		
LINE#	FINANCIAL ACCT	AMT OF FIN ASST	START DATE	END DATE	TAS ACCT	PO LINE DESCRIPTION	
10	20177368-10	\$0.00	07/15/2019	05/14/2022	0804	Modification 02 - NCE through 5/14/2022	

NOTICE OF AWARD (Continuation Sheet)

PAGE 2 of 3		DATE ISSUED 11/09/2021
GRANT NO.	G19A	AC00193-02

REMARKS:

Issuing Office:

U.S. Geological Survey Office of Acquisition and Grants 12201 Sunrise Valley Drive, M205 Reston, VA 20192

Sara Roser, Grant Specialist Phone: (703) 648-7357 Email: sroser@usgs.gov

USGS Program Officer:

Daryll Pope

USGS National Groundwater Monitoring Network

1730 East Parham Road Richmond, VA 23228 Phone: (804) 261-2630 Email: dpope@usgs.gov

Principal Investigator:
D. Mark Durway
NC DEQ Division of Water Resources
1611 Mail Service Center
Raleigh, NC 27699 1611

Phone: (919) 707-9018

Email: mark.durway@ncdenr.gov

NOTICE OF AWARD (Continuation Sheet)

PAGE 3 of 3		DATE ISSUED 11/09/2021
GRANT NO.	G19 <i>A</i>	AC00193-02

Federal Financial Report Cycle						
Reporting Period Start Date	Reporting Period Due Date					
07/15/2019	07/14/2020	Annual	10/12/2020			
07/15/2020	07/14/2021	Annual	10/12/2021			
07/15/2021	05/14/2022	Final	09/11/2022			

AWARD ATTACHMENTS

North Carolina Department Of Environmental Quality

G19AC00193-02

1. Modification 02 Attachment

Modification Attachment North Carolina Department of Environmental Quality Award Number G19AC00193 Modification 02

- 1. In accordance with Section 8, "Revisions and Prior Approvals," the Contracting Officer hereby extends the budget and project periods to 5/14/2022, at no additional cost to the Government, and updates the Principal Investigator. The recipient's email, dated 10/19/2021, is incorporated herein by reference.
- 2. The budget period is hereby changed from 7/15/2019 through 11/14/2021 to 7/15/2019 through 05/14/2022.
- 3. The project period is hereby changed from 7/15/2019 through 11/14/2021 to 7/15/2019 through 05/14/2022.
- 4. All other terms and conditions remain unchanged.

-- End of Modification No. 02--