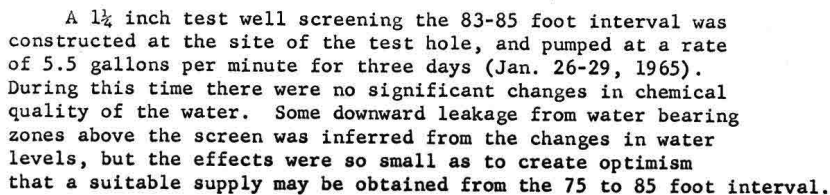




Supporting Hydro Data

08-00-0000: letter to nps from department of the interior regarding a test well augured in the cape point well field



Mr. Cox

- 2 -

March 23, 1965

The yield of the test well was low, and the sustained pumping time was short. On the basis of this test it is impossible to say with certainty that significant downward leakage of water of inferior quality will not occur if a number of higher yielding production wells are pumped on a long-term basis. The most feasible way to test this zone would be to construct four 2-inch test wells screened in the 76 to 86 foot interval in such a manner that they could be either alternatively or simultaneously pumped on the same schedule as the main supply system. Close observation of the response of these wells to the normal demands of the system over a two or three year period would indicate with a large degree of certainty the possibility of using this water bearing zone as a permanent source of large quantities of water of good quality in this area.

Sincerely,

Orville B. Lloyd, Jr.
Geologist

For Granville G. Wyrick
District Geologist

Attachment

cc: Mr. Karl T. Gilbert

CAPE POINT WELL FIELD							AUGER HOLE DATA	
January 12, 1965								
Depth of Interval Sampled	* Q gpm	* Vac in. Hg	* Temp °F	* Cl ppm	* Total Hardness ppm	* Total Fe ppm	Lithology	Remarks
0-10'							Sand, tan to orange, fine to medium quartz sand.	
10-20'	2.0	29	66.5	22	205	.38	Sand, white to tan, coarse to medium quartz sand with coarse broken shell fragments.	Odor (?)
20-30'	6.0	13.	66	27	216	1.2	Same as the 10-20' interval.	Slight H ₂ S odor.
30-40'	6.0	12	67	19	204	1.9	Sand, blue gray, coarse quartz sand with coarse broken shell fragments; grading to medium to fine sand in lower 5 feet.	Slight H ₂ S odor, little color.
40-50'	4.5	24.5	67.5	17	268	.40	Sand, blue gray, medium to fine quartz sand, with broken shell fragments.	No odor, taste good, very little color.
50-60'	4.0	27	66	18	238	.16	Sand, blue gray, medium to fine quartz sand, grading to fine to very fine quartz sand in lower 5 feet. Shell fragments prominent.	Little or no odor, taste good, little color.
60-70'	1.3	29		43	163	.26	Sand and silt, blue gray, fine to very fine quartz sand with 25% silt, muscovite flakes and shell fragments common.	Slight H ₂ S odor, noticeable color.
70-80'	1.2	29		85	158	.25	Same as the 60-70' interval.	No odor, taste good.
80-90'	3.8	28		28	206	.30	Sand, blue gray, medium to fine quartz sand, broken shell fragments common.	No odor, taste good.
90-100'	0	30					Sand and silt, blue gray, 50% fine to very fine quartz sand, 50% silt, muscovite flakes common.	
100-130'	0	30					Same as 90-100' interval.	

*All figures refer to top 2 feet of interval sampled; i.e., 10-12'

RAL-2

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 43244

Location <u>Buxton, N. C. - Dare Co.</u>			
Source <u>Test well # 1. Depth: 75-85 ft. Diameter: 2". Drilled: 4-65.</u>			
Collected at well. Owner: <u>USNPS</u> . Treatment: <u>None</u> . Use: <u>Domestic</u> , <u>PS</u> . <u>WBF</u> : <u>Sand</u> .			
Yield <u>12 gpm</u> . Test wells to be connected to <u>USNPS</u> supply system for extended period.			
Date of collection <u>April 3, 1965</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°F) _____			
(Parts per million)			
Silica (SiO ₂).....		Carbonate (CO ₃).....	
Aluminum (Al).....		Bicarbonate (HCO ₃).....	256
Iron (Fe).....	.52	Sulfate (SO ₄).....	
Manganese (Mn).....		Chloride (Cl).....	17
Calcium (Ca).....		Fluoride (F).....	
Magnesium (Mg).....		Nitrate (NO ₃).....	
Sodium (Na).....		Phosphate (PO ₄).....	
Potassium (K).....		.....	
Lithium (Li).....		.....	
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....		Color.....	
Residue upon evaporation @ 180°C.....		.....	
Hardness as CaCO ₃	195	.....	
Noncarbonate.....		.....	
pH.....	7.7	Specific conductance (micromhos at 25°C).....	455

Unpublished records subject to revision

RAL-2

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 44548

Location <u>Buxton, N. C. - Dare County</u>			
Source <u>Well # 1</u>			
Date of collection <u>Aug. 26, 1965</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°F) _____			
(Parts per million)			
Silica (SiO ₂).....		Carbonate (CO ₃).....	
Aluminum (Al).....		Bicarbonate (HCO ₃).....	278
Iron (Fe).....	0.34	Sulfate (SO ₄).....	
Manganese (Mn).....		Chloride (Cl).....	20
Calcium (Ca).....		Fluoride (F).....	
Magnesium (Mg).....		Nitrate (NO ₃).....	
Sodium (Na).....		Phosphate (PO ₄).....	
Potassium (K).....		.....	
Lithium (Li).....		.....	
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....		Color.....	
Residue upon evapo- ration @ 180°C.....		Zinc (Zn)	.2
Hardness as CaCO ₃	188	Copper (Cu)	.03
Noncarbonate.....	0	.....	
pH.....	8.0	Specific conductance (micromhos at 25°C).....	492

Unpublished records subject to revision

RAL-2

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 43245

Location <u>Buxton, N. C. - Dare County</u>			
Source <u>Test well # 2. Depth: 75 - 85 ft. Diameter: 2 in. Drilled: 4-65. Collected</u>			
<u>at well. Owner: USNPS. Treatment: None. Use: Domestic, PS. WBF: Sand. Yield:</u>			
<u>20 gpm. Test well to be connected to USNPS supply system for extended period.</u>			
<u>Hydrogen sulfide odor.</u>			
Date of collection <u>April 3, 1965</u>			
Gage height(ft.) _____		Discharge(sec.ft.) _____ Temp.(°F) _____	
(Parts per million)			
Silica (SiO ₂).....		Carbonate (CO ₃).....	
Aluminum (Al).....		Bicarbonate (HCO ₃).....	263
Iron (Fe).....	.23	Sulfate (SO ₄).....	
Manganese (Mn).....		Chloride (Cl).....	16
Calcium (Ca).....		Fluoride (F).....	
Magnesium (Mg).....		Nitrate (NO ₃).....	
Sodium (Na).....		Phosphate (PO ₄).....	
Potassium (K).....		.....	
Lithium (Li).....		.....	
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....		Color.....	
Residue upon evapo- ration @ 180°C.....		.....	
Hardness as CaCO ₃	207	.....	
Noncarbonate.....		.....	
pH.....	7.7	Specific conductance (micromhos at 25°C).....	460

Unpublished records subject to revision

RAL-2

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 44550

Location <u>Buxton, N. C. - Dare County</u>			
Source <u>Well # 2.</u>			
Date of collection <u>August 26, 1965</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°F) _____			
(Parts per million)			
Silica (SiO ₂).....		Carbonate (CO ₃).....	
Aluminum (Al).....		Bicarbonate (HCO ₃).....	268
Iron (Fe).....	0.16	Sulfate (SO ₄).....	
Manganese (Mn).....		Chloride (Cl).....	18
Calcium (Ca).....		Fluoride (F).....	
Magnesium (Mg).....		Nitrate (NO ₃).....	
Sodium (Na).....		Phosphate (PO ₄).....	
Potassium (K).....		.....	
Lithium (Li).....		.....	
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....		Color.....	
Residue upon evapo- ration @ 180°C.....		Zinc (Zn)	.6
Hardness as CaCO ₃	195	Copper (Cu)	.04
Noncarbonate.....	0		
pH.....	8.0	Specific conductance (micromhos at 25°C).....	476

Unpublished records subject to revision

RAL-2

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 43246

Location <u>Buxton, N. C. - Dare County</u>			
Source <u>Test well # 3. Depth: 75-85 ft. Diameter: 2 in. Drilled: 4-65.</u>			
Collected at well. Owner: USNPS. Treatment: None. Use: Domestic, PS. Yield: 16 gpm.			
WBF: Sand. Test well to be connected to USNPS supply system for extended period.			
Date of collection <u>April 3, 1965</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°F) _____			
(Parts per million)			
Silica (SiO ₂).....		Carbonate (CO ₃).....	
Aluminum (Al).....		Bicarbonate (HCO ₃).....	326
Iron (Fe).....	.27	Sulfate (SO ₄).....	
Manganese (Mn).....		Chloride (Cl).....	19
Calcium (Ca).....		Fluoride (F).....	
Magnesium (Mg).....		Nitrate (NO ₃).....	
Sodium (Na).....		Phosphate (PO ₄).....	
Potassium (K).....		.....	
Lithium (Li).....		.....	
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....		Color.....	
Residue upon evapo- ration @ 180°C.....		.....	
Hardness as CaCO ₃	228	.....	
Noncarbonate.....		.....	
pH.....	7.7	Specific conductance (micromhos at 25°C).....	555

Unpublished records subject to revision

RAL-2

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 43325

Location <u>Cape Point, N. C. - Dare Co.</u>			
Source <u>2" Test well # 4. Yield: 8 gpm.</u>			
Date of collection <u>April 1965</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°F) _____			
(Parts per million)			
Silica (SiO ₂).....		Carbonate (CO ₃).....	
Aluminum (Al).....		Bicarbonate (HCO ₃).....	348
Iron (Fe).....	.66	Sulfate (SO ₄).....	
Manganese (Mn).....		Chloride (Cl).....	17
Calcium (Ca).....	43	Fluoride (F).....	
Magnesium (Mg).....	32	Nitrate (NO ₃).....	
Sodium (Na).....		Phosphate (PO ₄).....	
Potassium (K).....		.....	
Lithium (Li).....		.....	
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....		Color.....	
Residue upon evapo- ration @ 180°C.....		.....	
Hardness as CaCO ₃	241	.....	
Noncarbonate.....	0	.....	
pH.....	7.7	Specific conductance (micromhos at 25°C).....	550

Unpublished records subject to revision

RAL-2

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 44549

Location <u>Buxton, N. C. - Dare County</u>			
Source <u>Well # 4</u>			
Date of collection <u>August 26, 1965</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp. (°F) _____			
(Parts per million)			
Silica (SiO ₂).....		Carbonate (CO ₃).....	
Aluminum (Al).....		Bicarbonate (HCO ₃).....	354
Iron (Fe).....	0.37	Sulfate (SO ₄).....	
Manganese (Mn).....		Chloride (Cl).....	21
Calcium (Ca).....		Fluoride (F).....	
Magnesium (Mg).....		Nitrate (NO ₃).....	
Sodium (Na).....		Phosphate (PO ₄).....	
Potassium (K).....		.....	
Lithium (Li).....		.....	
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....		Color.....	
Residue upon evapo- ration @ 180°C.....		Zinc (Zn).....	.1
Hardness as CaCO ₃	233	Copper (Cu).....	.04
Noncarbonate.....	0	.....	
pH.....	8.1	Specific conductance (micromhos at 25°C).....	594

Unpublished records subject to revision

RAL-2

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 44378

Location <u>Buxton, N. C. - Dare County</u>			
Source <u>Distribution System</u>			
Date of collection <u>August 26, 1965</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°F) _____			
(Parts per million)			
Silica (SiO ₂).....	17	Carbonate (CO ₃).....	0
Aluminum (Al).....	.3	Bicarbonate (HCO ₃).....	304
Iron (Fe).....	.03	Sulfate (SO ₄).....	1.8
Manganese (Mn).....	.00	Chloride (Cl).....	24
Calcium (Ca).....	45	Fluoride (F).....	.5
Magnesium (Mg).....	19	Nitrate (NO ₃).....	2.2
Sodium (Na).....	33	Phosphate (PO ₄).....	.4
Potassium (K).....	11	.....	
Lithium (Li).....		.....	
(Parts per million)			
Dissolved solids:			
Sum.....	303	ABS.....	
Residue upon evapo- ration @ 180°C.....	324	Color.....	33
Hardness as CaCO ₃	194 <u>y</u>	.....	
Noncarbonate.....	0	.....	
pH.....	7.9	Specific conductance (micromhos at 25°C).....	561

y Includes hardness of all polyvalent cations reported.

Unpublished records subject to revision

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 42296

Location <u>Buxton, N. C. - Dare County</u>			
Source <u>Cape Point well field; Well # 1. Owner: USNPS. Treatment: None.</u>			
Use: <u>Domestic and public supply.</u>			
Date of collection <u>Sept. 29, 1964</u>			
Gage height(ft.) _____		Discharge(sec.ft.) _____ Temp.(°F) _____	
(Parts per million)			
Silica (SiO ₂).....	8.7	Carbonate (CO ₃).....	0
Aluminum (Al).....		Bicarbonate (HCO ₃).....	319
Iron (Fe).....	3.7	Sulfate (SO ₄).....	3.8
Manganese (Mn).....		Chloride (Cl).....	30
Calcium (Ca).....	93	Fluoride (F).....	.2
Magnesium (Mg).....	7.9	Nitrate (NO ₃).....	.5
Sodium (Na).....	18	Phosphate (PO ₄).....	.1
Potassium (K).....	2.1	Alkalinity as CaCO ₃	262
Lithium (Li).....		Calculated CO ₂	20
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....	326	Color.....	
Residue upon evapo- ration @ 180°C.....		Coliform Bacteria:	0/100 ml.
Hardness as CaCO ₃	266	.....	
Noncarbonate.....	4	.....	
pH.....	7.4	Specific conductance (micromhos at 25°C).....	590

Rec'd w/ Reg memo 1/22/65

UNPUBLISHED RECORD
SUBJECT TO REVISION

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 42297

Location <u>Buxton, N. C. - Dare County</u>			
Source <u>Cape Point well field; Well # 2. Owner: USNPS. Treatment: None.</u>			
Use: <u>Domestic and public supply.</u>			
Date of collection <u>Sept. 29, 1964</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°F) _____			
(Parts per million)			
Silica (SiO ₂).....	7.9	Carbonate (CO ₃).....	0
Aluminum (Al).....		Bicarbonate (HCO ₃).....	242
Iron (Fe).....	2.6	Sulfate (SO ₄).....	4.2
Manganese (Mn).....		Chloride (Cl).....	20
Calcium (Ca).....	75	Fluoride (F).....	.1
Magnesium (Mg).....	4.1	Nitrate (NO ₃).....	.2
Sodium (Na).....	12	Phosphate (PO ₄).....	.1
Potassium (K).....	.7	Alkalinity as CaCO ₃	198
Lithium (Li).....		Calculated CO ₂	10
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....	246	Color.....	
Residue upon evapo- ration @ 180°C.....		Coliform bacteria:	0/100 ml.
Hardness as CaCO ₃	204	.....	
Noncarbonate.....	5	.....	
pH.....	7.6	Specific conductance (micromhos at 25°C).....	445

UNPUBLISHED RECORDS
SUBJECT TO REVISION

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 42295

Location <u>Buxton, N. C. - Dare County</u>			
Source <u>Cape Point Well Field; Well # 3. Owner: USNPS. Treatment: None.</u>			
Use: <u>Domestic and public supply.</u>			
Date of collection <u>Sept. 29, 1964</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°F) _____			
(Parts per million)			
Silica (SiO ₂).....	8.6	Carbonate (CO ₃).....	0
Aluminum (Al).....		Bicarbonate (HCO ₃).....	218
Iron (Fe).....	2.4	Sulfate (SO ₄).....	4.2
Manganese (Mn).....		Chloride (Cl).....	19
Calcium (Ca).....	65	Fluoride (F).....	.2
Magnesium (Mg).....	4.9	Nitrate (NO ₃).....	.4
Sodium (Na).....	12	Phosphate (PO ₄).....	.2
Potassium (K).....	1.4	Alkalinity as CaCO ₃	179
Lithium (Li).....		Calculated CO ₂	11
(Parts per million)			
Dissolved solids:			
Sum.....	225	ABS.....	
Residue upon evapo- ration @ 180°C.....		Color.....	
Hardness as CaCO ₃	182	Coliform bacteria.....	0/100 ml.
Noncarbonate.....	4	.....	
pH.....	7.5	Specific conductance (micromhos at 25°C).....	405

UNPUBLISHED RECORDS
SUBJECT TO REVISION

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 42294

Location <u>Buxton, N. C. - Dare County</u>			
Source <u>Cape Point well field; Well # 4. Owner: USNPS. Treatment: None.</u>			
Use: <u>Domestic and public supply.</u>			
Date of collection <u>Sept. 29, 1964</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°F) _____			
(Parts per million)			
Silica (SiO ₂).....	6.7	Carbonate (CO ₃).....	0
Aluminum (Al).....		Bicarbonate (HCO ₃).....	239
Iron (Fe).....	1.8	Sulfate (SO ₄).....	7.8
Manganese (Mn).....		Chloride (Cl).....	18
Calcium (Ca).....	75	Fluoride (F).....	.1
Magnesium (Mg).....	4.3	Nitrate (NO ₃).....	.3
Sodium (Na).....	12	Phosphate (PO ₄).....	.1
Potassium (K).....	.9	Alkalinity as CaCO ₃	196
Lithium (Li).....		Calculated CO ₂	12
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....	245	Color.....	
Residue upon evapo- ration @ 180°C.....		Coliform bacteria:	0/100 ml.
Hardness as CaCO ₃	204	.....	
Noncarbonate.....	8	.....	
pH.....	7.5	Specific conductance (micromhos at 25°C).....	440

UNPUBLISHED RECORDS
SUBJECT TO REVISION

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 42293

Location <u>Buxton, N. C. - Dare County</u>			
Source <u>Temporary well field. Owner: USNPS. Treatment: None. Use: Domestic</u> <u>and public supply. Well field located in dunes near museum.</u>			
Date of collection <u>Sept. 21, 1964</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°F) _____			
(Parts per million)			
Silica (SiO ₂).....	11	Carbonate (CO ₃).....	0
Aluminum (Al).....		Bicarbonate (HCO ₃).....	200
Iron (Fe).....	1.3	Sulfate (SO ₄).....	3.2
Manganese (Mn).....		Chloride (Cl).....	23
Calcium (Ca).....	64	Fluoride (F).....	.1
Magnesium (Mg).....	3.9	Nitrate (NO ₃).....	4.0
Sodium (Na).....	15	Phosphate (PO ₄).....	.2
Potassium (K).....	1.2	Alkalinity as CaCO ₃	164
Lithium (Li).....		Calculated CO ₂	20
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....	225	Color.....	
Residue upon evapo- ration @ 180°C.....		Coliform bacteria:	135/100 ml.
Hardness as CaCO ₃	177	.....	
Noncarbonate.....	13	.....	
pH.....	7.2	Specific conductance (micromhos at 25°C).....	425

UNPUBLISHED RECORDS
SUBJECT TO REVISION



DSO 39

BOARD OF WATER COMMISSIONERS

STATE OF NORTH CAROLINA

P. O. BOX 2206

RALEIGH

September 4, 1958

Recd

J. B. Tuckwell, Governor
Governor
Department of Conservation and Development
Raleigh, N.C.
W. H. Riley, Executive Secretary

Cape Hatteras	
North	
SEP 11 1958	
Superintendent	
Asst. Sup.	
Adm. Assistant	
Chief Engineer	
Chief Clerk	
Chief of Police	
Chief of Fire	
Chief of Health	
Chief of Education	
Chief of Agriculture	
Chief of Forestry	
Chief of Fisheries	
Chief of Game and Inland Fisheries	
Chief of Parks and Recreation	
Chief of Conservation and Development	
Chief of State	
Chief of Federal	
Chief of Local	
Chief of International	
Chief of Other	

Mr. H. Bruce Smith
Regional Chief of Operations
National Park Service
Region One
Richmond, Virginia

Dear Mr. Smith:

Your letter of September 3, in regard to the drilling of test wells in Dare and Hyde Counties, has been received.

The only state law regarding drilling operations in the state requires that a well driller must register with the Mineral Resources Division of the Department of Conservation and Development. However, if this drilling is done by a federal agency the agency will not be required to register. Private well drillers are the only ones who are required to register in this state.

Registration merely amounts to writing a card or letter to the Mineral Resources Division stating that the undersigned well driller is planning on drilling wells in the State of North Carolina.

Sincerely yours,

W. H. Riley
Executive Secretary

County and hole number: **Dare County, Hole #3**

Location: Buxton, N. C.

Total income: 106

Number of samples: 21 Soil
18 Water

Edward Ouidley

Depth		Soil and color						
From	To	Gravel	Sand	Clay	Stones	Shell	Limestone	Other
Start	11		fine Sand					
11	16	Gravel and				Shell mixed		
16	31		coarse Sand					
31	46		fine Sand					
46	66		coarse Sand (good sign of water)					
66	76	Gravel and Sand mixed						
76	81		coarse Sand and			Shell mixed		
81	91		Sand	Clay and		Shell mixed		
91	96		fine Sand	~~and gravel~~		~~Shell mixed~~		
96	106		Sand, Rock and			Shell mixed		
91	106		Hard driving, sand, shell and rock mixed.					
Some water most of way from Start to 106'. Missed two soil samples.								

From 76 to 59 good flow
of water found. Jet
pump good and fresh

U. S. GEOLOGICAL SURVEY, GROUND WATER BRANCH

Raleigh, N. C.

Sample - Description and Drilling - Time Log

Dates: 9/9/58

Elevation of hole:

County and hole number: Dare County, Hole #3

Depth to water table: 3'

Location: Buxton, N. C.

Formations encountered:

Total footage: 106

Number of samples: 21 Soil
18 Water

Logged by Edward Quidley

Depth		Lithology and color							Drilling Time	
From	To	Gravel	Sand	Clay	Marl	Shell	Limestone	Other	Began	Ended
Start	11		Fine Sand							
11	16	Gravel and				Shell mixed			9/9/58	10/9/58
16	31		Coarse sand						Remarks	
31	46		Fine Sand							
46	66		Coarse sand (good sign of water)						From 76 to 59 good flow	
66	76	Gravel and sand mixed							of water found. Jet	
76	81		Coarse sand and			Shell mixed			pump, good and fresh	
81	91		Sand	Clay and		Shell mixed				
91	96		Fine Sand							
96	106		Sand, Rock and			Shell mixed				
91	106	Hand driving, sand, shell and rock mixed.								

Some water most of way from Start to 106'. Missed two soil samples.

Dates: 8/26/58

Elevation of hole:

County and hole name: **Dare County, Hole #2**

Depth in water below: 10'

Location: **Buxton, N. C.**

Formations encountered:

Total footage: 91'

Number of samples: 18 Soil
14 Water

Directed by: **Edward Quidley**

8/26/58 9/9/58

Good flow 71-76
Good flow 46-41
Good flow 31-26
Good flow 21-16
on test pump

U. S. GEOLOGICAL SURVEY, GROUND WATER BRANCH

Raleigh, N. C.

Sample - Description and Drilling - Time Log

Dates: 8/26/58

Elevation of hole:

County and hole number: Dare County, Hole #2

Depth of water table: 10'

Location: Buxton, N.C.

Formations encountered:

Total footage: 91'

Number of samples: 18 Soil
14 Water

Logged by: Edward Quidley

Depth		Lithology and color									
From	To	Gravel	Sand	Clay	Marl	Shell	Limestone	Other	Began	Ended	
Start	56		Sand and			Shell mixed			8/26/58	9/9/58	
56	61			Clay and		Shell mixed					
61	71		fine Sand						Remarks		
71	81	Gravel and	Sand mixed						Good flow	71-76	
81	86		coarse sand						Good flow	46-41	
86	91		Sand turning to			Shell			Good flow	31-26	
									Good flow	21-16	
61	71	driving becomes hard in fine sand losing water from jet pump. Good sign of water								on test pump	
81	91	Clay, gravel, shell and sand mixed driving is hard.									

Some water most of way. Missed two samples, one from 86-81 and one from 61-56.

U. S. GEOLOGICAL SURVEY, GROUND WATER BRANCH

Raleigh, N. C.

Sample Description and Drilling - Time Log

Dates: July 9, 1958

Elevation of hole;

County and hole number: Dare County, Hole #1

Depth to water table: 22'

Location: Buxton

Formations encountered:

Total footage: 91

Number of samples: Soil 17
Water 11

Logged by: Edward Quidley

d	From	To	Gravel	Sand	Clay	Marl	Shell	Limestone	Other	Began	Ended
Start		21		Sand							
21		26	Gravel	Sand	Mixed					7-9-58	8-25-58
26		31	Gravel				Shell				
31		66		Fine Sand			Shell			Remarks:	
66		71			Clay and		Shell			Best flow 31-29	
					Shell turning to coarse sand full of water					26-24	
71		91	Gravel	Sand and			Shell mixed				

Some water most of way from 21 to 66. Clay and shell from 66 to 71. Good lens of water from 71 to 76. When water supply is slow, driving is very hard in Sand-Shell and sand-gravel.

Other Supporting Information

Form 10-174 (June 1962)		UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE		Work Order No. 603-211737	
FACE SHEET FOR COMPLETION REPORT					
Park Cape Hatteras National Seashore		Region Southeast		Fund Symbol 14x1035	
Location in Park Buxton, Hatteras Island		State(s) North Carolina		Year Programmed 1969 L.S.	
☒ Contract and/or ☐ Day Labor		County or Counties Dare		PCP No. U-121	
Work Order Title Disposal of Water Treatment Wastes, Buxton Well Field				Master Plan No.	
				Master Plan Corrected By	
				As Built Drawings By PSC-DC	
				Date Started January 7, 1969	
				Date Completed April 25, 1969 <i>AS</i>	
DESCRIPTION OF FIXED ASSETS (For completion by employee in charge of project)				TOTAL COSTS (For completion by FFO)	
✓ 230 - Utility Systems 18,236.00				21,153.76	
1. Water Systems					
TOTAL				\$ 21,153.76	
DISTRIBUTION					
No.	To	THE FIXED ASSET DESCRIBED ABOVE HAS BEEN COMPLETED IN ACCORDANCE WITH APPROVED DRAWINGS, SPECIFICATIONS, AND AUTHORIZED CHANGES			
	Submitted By: Howard L. Culp	Title: Project Supervisor		Date: 5/28/69	
	Approved By: Kittridge A. Wing	Title: Superintendent		Date: June 2, 1969	
	COSTS VERIFIED BY T. J. Baer	Title: Regional Accountant		Date: JUN 13 1969	
A DC 88-14218					
Rec'd up memo to Dept. from: WCC dated July 14, 1969					
11760					

Form 10-411
(July 1965)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

DISTRIBUTION OF COPIES	
NO.	TO
6	Regional Director, Southeast Region (for redistribution)

PROJECT CONSTRUCTION PROPOSAL

URGENT - HIGH PRIORITY

1. STATEMENT OF MANAGEMENT'S REQUIREMENTS, PROPOSED WORK, AND ITS RELATIONSHIP TO OTHER FACETS OF THE PARK PROGRAM. (Provide detail data for "Management Information" on Form 10-411a, Supplemental Sheet and attach.)

Project is located at the Buxton Well Field, Hatteras Island, and includes an ~~approximately 2000' x 200' of~~ adequate-sized line capable of carrying disposal wastes from the treatment plant at the well field pump house, to ~~be disposed of in the Atlantic~~ a point beyond the influence of the ground water source of the seashore or nearby users of the source.

A structure of some sort will be needed at the disposal end of the waste line to protect it from the elements and vandalism.

The existing building housing the Treatment Plant is equipped with electrical power and has adequate room to house the waste disposal pump. The alignment of the waste line should follow the existing right-of-way of the water line serving Cape Point Campground, thereby eliminating another scar on the topography.

URGENT - HIGH PRIORITY

(continued)

2. ADVANCE REQUIREMENTS DATA

LAND STATUS		MASTER PLAN NO.	APPROVAL DATE
Government Owned		NS-CH	Pending
PCP NUMBERS OF PREVIOUSLY COMPLETE PORTIONS		INTERRELATED & DEPENDENT PROJECT PCP NUMBERS	
INTERPRETIVE PROSPECTUS APPROVAL DATA		DATE	
None			
WATER RIGHT NEEDS & STATUS			
None			
RESEARCH NEEDS & STATUS			
None			
OTHER			
None			

3. RECOMMENDED BY SUPERINTENDENT (Signature & Date)

[Signature] Acting Superintendent 7/10/67

4. APPROVED BY REGIONAL DIRECTOR (Signature & Date)

[Signature] 7/19/67

5. LOCATION WITHIN AREA OR TERMINI

Hatteras Island - Cape Point Area

6. BLDG. OR RT.# AND SEC.

7. REGION

Southeast

8. PARK

CAPE HATTERAS NATIONAL SEASHORE

9. PROJECT

DISPOSAL OF WATER TREATMENT WASTES AT
BUXTON WELL FIELD

Dare

(County)

No. Carolina

(State)

10. PCP INDEX NO.

U-121

ESTIMATE		QUANTITY	COST
Lift Pumping Station	IS		\$ 4,500
Electrical Hook-Up			250
3" Plastic Pipe	3600		14,400
(Correction inserted as per Mr. Mauro's telephone call to Mr. Bainbridge 8/2/67)	~~1800~~ lf. @ \$4		~~-7,200~~
			\$19,120
RESEARCH ESTIMATE APPROVED:	ESTIMATE TOTALS		~~\$11,950~~
(Asst. Director, Resource Studies)	RESEARCH.....		\$19,120
(Date)	Construction.....		~~\$11,920~~
	Plans, Surveys, and		3,830
	Supervision.....		~~2,590~~
			2,550
	Contingencies		~~1,590~~
CONSTRUCTION ESTIMATE APPROVED:	CONSTRUCTION		\$25,500
H. Reese Smith	SUB TOTAL		~~\$15,900~~
(Design Office Chief)	INTERPRETIVE		
INTERPRETIVE ESTIMATE APPROVED:	SUB TOTAL (100%)		\$25,500
(Asst. Regional Director, Op	GRAND TOTAL		~~\$15,900~~
(Date)			

SUPPLEMENTAL INFORMATION FOR PROJECT CONSTRUCTION PROPOSAL

PARK CAPE HATTERAS NATIONAL SEASHORE	FACILITY DISPOSAL OF WATER TREATMENT WASTES, BUXTON WELL FIELD	P.C.P. NO. U-121
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1. MANAGEMENT INFORMATION

The demand on the well field during the peak of heavy visitation is over 60,000 gallons per day and is produced from an aquifer of from 25 to 35 ft. in depth. There is every indication the demands on this water system will become greater in the future, which will result in a greater amount of treatment waste to be disposed of.

To protect against permanent damage to the well field through the accumulation of salt build-up from the treatment plant wastes, that would eventually migrate into the fresh water aquifer, it is the recommendation of Hugh B. Wilder, Chemist, U. S. G. S., Report of January 3, 1967, that the waste liquid be dumped into the ocean.

The entire Cape Point Complex is depending on the Buxton Well Field for its survival. If it is destroyed, the usefulness to the Public of the big investment the Government has in this area will be drastically reduced.

The construction of an effective waste disposal system will provide the protection to the most vital commodity in the development and operation of the Park, potable water.

2. TECHNICAL INFORMATION

Form 10-174A (June 1962)		UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE		Work Order Number 603-211737
COMPOSITION OF COST FOR COMPLETION REPORT				Fund Symbol 14x1035
Park	Cape Hatteras National Seashore	Region	SE	Year Programmed 1969 L.S.
Location in Park Buxton, Hatteras Island				
Work Order Title Disposal of Water Treatment Wastes, Buxton Well Field				

COMPOSITION OF COST

COSTS CHARGED TO FUNDS ALLOTTED TO FIELD FINANCE OFFICE		
(1) Personal Services.....	\$	
(2) Travel.....		
(3) Contract Work.....	18,236.00	
(4) Supplies and Materials.....		
(5) Other Direct Expenses.....		
(6) Operation of Equipment.....		
(7) Depreciation of Equipment.....		
(8) Purchase of Construction Equipment.....		
(9) Purchase of Other Accountable Equipment.....		
(10) Other Costs:		
(11) TOTAL COST CHARGED TO FFO FUNDS.....	xxxxxxxxxx	\$ 18,236.00
OTHER COSTS:		
(12) PS&S, AP, and/or Facilitating Services @ 16 %.....	\$ 2,917.76	
(13) Inventory and Other Non-Fund Costs		2,917.76
(14) GROSS WORK ORDER COSTS.....	xxxxxxxxxx	\$ 21,153.76
LESS:		
(15) Residual Value of Construction Equipment on Line 8.....	\$	
(16) Other Credits		
(17) NET COST OF FIXED ASSETS.....	xxxxxxxxxx	\$ 21,153.76

Identify other costs and other credits by line item entry, on an attached schedule, or explain in narrative.

NARRATIVE REPORT

Disposal of Water Treatment Wastes
Cape Hatteras National Seashore
(Hatteras Island)
Contract No. 14-10-7-981-109

Date of Bid Invitation (IFB No. D&C-7-E-69)	August 27, 1968
Date of Bid Opening	October 1, 1968
Number of Bids Received	Three (3)
Low Bid	\$18,099.99
Date Contract Awarded	October 28, 1968
Amount of Original Contract	\$18,099.99
Final Contract Amount	\$18,236.00

Prime Contractor:

Tolson Building Systems
1140 South Main Street
Harrisonburg, Virginia 22801

Preconstruction Conference Date January 8, 1969

In attendance:

Charles Linton, Contractor's Representative
David L. Olson, General Supply Specialist, Cape Hatteras
Dennis E. McGinnis, Chief of Maint., Cape Hatteras
Joseph B. Lusa, Asst. Chief of Maint., Cape Hatteras
Coly F. Caudill, District Ranger, Cape Hatteras
Howard L. Culp, Project Supervisor, PSC-DC

Date of Notice to Proceed	December 27, 1968
Beginning Date	January 7, 1969
First Day of Work at Site	January 13, 1969
Contract Completion Date	February 10, 1969
Extended Contract Completion Date	April 25, 1969
Last Day of Work at Site	April 24, 1969
Date of Formal Inspection for Acceptance	April 25, 1969

In attendance:

Charles Linton, Contractor's Representative
Preston D. Riddel, Asst. Supt., Cape Hatteras
Joseph B. Lusa, Asst. Chief of Maint., Cape Hatteras
Roy Gray, District Foreman, Cape Hatteras
Howard L. Culp, Project Supervisor, PSC-DC

Date of Acceptance	April 25, 1969
Date of Final Acceptance	April 25, 1969
Date of Release of Claims	May 6, 1969
Date of Final Estimate	May 8, 1969

Stop Order effective February 7, 1969. Resume Work Order effective March 18, 1969; 38 days involved; completion date extended to March 20, 1969.

Change Orders:

Change Order No. 1 dated March 19, 1969. Provided for eleven (11) additional days due to delivery delays. Completion date changed to March 31, 1969.

Change Order No. 2 dated April 25, 1969. Increased the contract price by \$136.01. Provided for deletion of manhole and overruns in piping. Allowed 25 additional days for delivery delay. Completion date changed to April 25, 1969.

Monthly Estimates:

1. February 25, 1969	\$ 9,702.00
2. May 8, 1969	8,534.00
<u>Total Contract Amount:</u>	<u>\$18,236.00</u>

Scope of Work: This contract consisted of installing 3,818 linear feet of 3" PVC pipeline with 30" cover; constructing a lift station with two 1½ H.P. sump pump and motor units, automatic controls, valve pit with valves, and 60 linear feet of 6" cast iron pipe. To connect the pump house to the lift station, 45 linear feet of new existing 4" asbestos pipe was used.

The lift station has 8" thick reinforced concrete walls and floor. It is 4' square inside and 6' deep. The housing assembly which covers the lift station (pumps and motors) is 4' high and is constructed of a 14 gauge galvanized metal roof, 18 gauge galvanized expanded metal sides, and 1 x 3/8-inch galvanized angles. Included in the lift station are two 1½ H.P. pumps (1 duty and 1 standby), pump cut-offs, high water alarm, pump controller, control panel, and a steel cover which supports the pump motor units and equipment.

A 2" PVC pipe connects the pump outlets to the valves in the valve pit, and also to a 3" PVC drain line. The valve pit is 4' deep, 4'-0" x 5'-2" inside, with 8" reinforced walls and floor. It is covered by a double lid manhole and frame. The valve pit contains a valve assembly for each pump.

The 3" PVC pipeline connects to a 6" cast iron pipe which discharges the water treatment wastes into a borrow pit.

Electric power for the pumps runs underground from a separate panel box inside the existing pump house.

The 3" pipeline has a 30" cover and is marked at every 90° turn and every 400' with concrete markers with (S) stamped on the top.

Howard L. Culp
Howard L. Culp
Project Supervisor

Contract No. 14-10-0131-827

Account No. B-26

Prime Contractor: John A. Johnston & Son
Belhaven, N.C. (Low bidder)

PCP No. U-36, U-38

Base Contract:

Bids Opened: November 7, 1961
No. Bids Received: Five (5)
Total Base Bid: \$62,318.00
Date of Contract: November 21, 1961
Notice to Proceed: November 21, 1961
Designated Commencement Date: December 2, 1961
Actual Commencement Date: December 11, 1961
Designated Completion Date: May 30, 1962
Actual Completion Date: May 17, 1962
Stop Order Date: None
Resume Work Order Date: None
Final Inspection Date: June 5, 1962
Final Acceptance Date: June 5, 1962
"Release of Claims" Dated: June 13, 1962
Final Estimate Submitted Date: June 15, 1962

Sub Contractors:

The Crom Corporation, Gainesville, Florida - Storage Tank

Change Orders:

Change Order No. 1	\$ 00.00	January 4, 1962
Change Order No. 2	546.00	February 21, 1962
Change Order No. 3	650.00	May 8, 1962

Change Orders Explained:

Change Order No. 1

Contractor gave a credit of \$2,500 to NPS for allowing him to use a different kind of water storage reservoir. This \$2,500 was used to buy: 1000' of 4" CI, which was used to replace existing 2" plastic pipe between the two existing comfort stations; 400' of 4" CI pipe to replace proposed 2" copper pipe at lower end of campground; 8 hydrants to be placed on the loop roads between the two comfort stations; and 6 small valves to be used in making connections to the comfort stations.

Change Order No. 2

The amount of \$546 was the amount necessary for materials and labor to paint the 200,000 gal. concrete water storage tank.

Change Order No. 3

1. Roads in campground cut by trench for pipe line were patched with hot mix asphalt at a cost of \$20/patch for 13 patches. \$260.00
2. Modifications to plumbing of the two existing stations made to take advantage of the new sewage disposal systems, paid by lump sum. 185.00
3. Movement of hydrants to newly specified locations made necessary the removal of some concrete footings, the purchase of some additional copper tubing, and the loss of approximately one day's working time. Paid by lump sum. 205.00

Monthly Payments

Estimate No. 1	January 3, 1962	\$ 14,520.06
Estimate No. 2	January 25, 1962	11,916.58
Estimate No. 3	February 26, 1962	16,432.61
Estimate No. 4	March 30, 1962	6,719.44
Estimate No. 5	May 9, 1962	5,225.75
Final Estimate	June 8, 1962	8,846.56

Actual Location, Size & Quantity of Contract Work:

1. 4" Cast Iron WL--Runs for full length of campground with tees at each existing comfort station and at each proposed comfort station--4" C.I. Line also runs for approximately 770' to a Y on the outside of the campground, lower end, where it joins the 6" A.C. WL. Each end of the 4" C.I. Line is closed with a taped cap with a 2" plug in it for convenience in draining, in cleaning, and in making future additions to the line. Total length of 4" C.I. WL is 3450'.
2. 6" Asbestos Cement WL--Runs in a direct line from the existing elevated water storage tank to a point approximately 350' outside the lower end of the existing campground. At this point it connects to the 4" CI Line via a Y. At this Y it also branches off for 1750' to the southwest of the campground. There is a tee and a 4" gate valve approximately 1600' from the elevated water tank for the future use of the Coast Guard. Total length of 6" A.C. WL is 6550'.
3. 2" Copper Pipe--At proposed comfort stations, this copper pipe runs from 4" CI WL to points 59' and 30", respectively, in areas set aside for comfort stations. Each is closed with a 2" gate valve. Pipe is to be feed lines for comfort stations. Total length of 2" copper WL is 80'.

4. Water Hydrants--Water Hydrants for drinking and cooking water are placed in pairs at each loop road in the existing campground. They are on opposite sides of each road. Each hydrant is from 5' to 50' from the 4" WL, with the majority being about 5'. Each hydrant has a stop and waste valve approximately 1' from the base of the hydrant. Total number of hydrants is 22.
5. Water Line Markers--Water line markers are placed at approximately 500' intervals for full length of WL. They are also placed at valves, Y's, tees, and ends of line. There are 40 WL markers.
6. 200,000 Gallon Concrete Water Storage Tank--This water storage tank was built directly behind the existing pump house near the elevated storage tank. The tank was built by the Crom Corp. of Gainesville, Fla., of shotcrete (pneumatically placed concrete). The tank is round in shape, with a shallow domed top. It is 45' in diameter, the walls are 17' in height. There is a 4" inlet-outlet pipe in the bottom of the tank, a fiberglass dome vent, a fiberglass hatch cover for the hatch on the front of the tank, and stainless steel interior and exterior access ladder. Further construction and dimension details contained in separate report.
7. Refurnishing Existing Pump House--Before refurnishing, the existing pump, fittings, etc., were removed. Four new well pumps, Goulds Pyramic V-P-100 -3/4-V; one new tank pump, Goulds Close Cupld 2 hp, 60 cye; hypochlorinator, Chlorinet Series A-745 w/McDonnell #E-2 Flowswitch; automatic control system which starts and stops well and tank pumps automatically by a floatless liquid level control system with probes located in the elevated tank and the storage tank--system capable of both automatic and manual operation. All other piping, fittings, and appurtenances are as shown in the plans.
8. Two Additional Sewage Disposal Systems and Two additions To Existing Sewage Disposal Systems--Each system is composed of 6" CI inlet pipe, 3300 gal. concrete septic tank, 10' of 6" CI outlet pipe, and a disposal field composed of 6 thirty foot long, 4" V.C. tile drain lines laid on 1"x6" grade board, placed 6' apart in a bed of washed 1 1/2" to 3" marl, and covered with 15# treated building paper. Each bed is bounded by 2-1"x6" boards one atop the other around the perimeter and is covered by 1" to 2' of sand. There is a sewage disposal system at each existing comfort station in the campground and one in each of the areas set aside for the proposed comfort stations.
9. Small Valves--Used in various spots to make connections to existing comfort stations, to close off stubbed 2" copper pipe at proposed comfort stations. Total of 6 valves. Need created by Change Order No. 1.

10. Painting of Water Storage Tank--Prime coat and finish coat of apple green on 200,000 gallon storage tank.
11. Patching of Roads, Movement of Water Hydrants, Changes to Plumbing of Existing Comfort Stations--It was necessary to patch each loop road in campground where it was crossed by the water line. Sleeves planned for use under roads were unsuitable and unusable. Patches were of hot mix asphalt, 2" to 3" thick, on original base material. Each patch was hand placed, raked, rolled, and compacted. Total of 13 patches.

Movement of water hydrants after placement decided upon by Park Staff to take advantage of proximity of pathway. Involved removal and replacement of some concrete and the purchase of additional $\frac{1}{2}$ " copper pipe.

Changes to plumbing of comfort stations were: Plugging of inlets from Women's side to main sewer outlet, pipe and fittings to run Women's side into new 3300 gal. septic tanks, and additional venting of lines to outside. Changes necessary in both comfort stations to take advantage of new sewage disposal systems.

Docket Information

Number of Documents in Docket 36

Documents Dated from 7/9/1958 to 6/13/1969

Docket Compiled: 2/1/2011